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The ups and downs of social life: Within-person variations in daily status and inclusion differentially predict self-regard and interpersonal behavior

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Abstract

Objective: Grounded in sociometer theory and hierometer theory, the current research examined, for the first time, how within-person fluctuations in people's status and inclusion relate to their self-regard and interpersonal behavior.

Method: We conducted a 10-day diary study and analyzed the data using multilevel modeling. Participants ($N = 415$) completed daily measures of their status, inclusion, self-esteem, narcissism, assertiveness, and affiliativeness.

Results: On days when both their status and inclusion were higher, participants reported higher self-esteem, but only on days when their status was higher did they report higher narcissism. Furthermore, on days when their self-esteem was higher, participants behaved more assertively and more affiliatively, but only on days when their narcissism was higher, did they behave more assertively. These patterns persisted after controlling for baseline individual differences in all constructs. Self-esteem, moreover, mediated the links between daily status and assertiveness, and between daily inclusion and affiliativeness; narcissism, in contrast, mediated the link between daily status and assertiveness only.

Conclusions: This research replicates at the within-person level empirical links previously found at the between-person level. The results suggest that narcissism operates chiefly as a hierometer (tracking status and regulating assertiveness), whereas self-esteem additionally operates as a sociometer (also tracking inclusion and regulating affiliativeness).

KEYWORDS

inclusion, interpersonal behavior, narcissism, self-esteem, self-regard, status, within-person variability

1 | INTRODUCTION

According to *Tears for Fears*, "Everybody wants to rule the world." Yet, according to *The Beatles*, "All you need is love." Both songs get it partly right: The need for *social status*—defined as being *respected and admired*—and the need for *social inclusion*—defined as being *liked and accepted*—are both regarded as fundamental human motives (Anderson,

Hildreth, & Howland, 2015; Baumeister & Leary, 1995). Indeed, both motives are powerful and pervasive, with wide-ranging implications for cognition, emotion, and behavior (Anderson et al., 2015; Fiske, 2010; Gregg & Mahadevan, 2014; Leary, 2010). For example, consistent with status being fundamental, higher status predicts greater life satisfaction, more positive affect, and less anxiety and depression (Anderson, Kraus, Galinsky, & Keltner, 2012; Fournier, 2009; Gregg, Mahadevan, & Sedikides, 2018). Likewise, consistent with inclusion being fundamental, higher inclusion predicts more positive affect, less anger and aggression, and less self-defeating behavior (Twenge, Baumeister, Tice, & Stucke, 2001; Twenge, Catanese, & Baumeister, 2002; Williams, Cheung, & Choi, 2000).

1.1 | Within-person variability in status and inclusion

Much research to date has focused on between-person differences in status and inclusion. However, differences in status and inclusion may also be profitably assessed at the within-person level. That is, not only may one person differ from another in their average level of status or inclusion, but also the same person may differ in their level of status or inclusion from one occasion to another. However, little research has examined how within-person differences in status and inclusion relate to other key within-person differences—in particular, to how people evaluate themselves, and to how they behave interpersonally.

The current research is designed to remedy this deficiency. We conducted a theoretically driven investigation into how within-person fluctuations in status and inclusion related to within-person fluctuations in self-regard and interpersonal behavior. We grounded our investigation in two theories—s*ociometer theory* and *hierometer theory* (described below)—from which we systematically derived specific hypotheses to test empirically.

To help articulate these theories and hypotheses, we begin by clarifying some key terminology. First, we employ the term "social relations" to cover both status and inclusion as defined above (Anderson et al., 2015; Fournier, 2009). Whereas status reflects where one stands vertically with respect to others (i.e., in the social hierarchy), inclusion reflects where one stands horizontally with respect to others (i.e., in the social community) (cf. Black, 1976). Whereas hierometer theory focuses on status, sociometer theory focuses on inclusion. Second, we employ the term "self-regard" to cover two types of global self-evaluation—*self-esteem* (Rosenberg, 1965) and *narcissism* (Sedikides & Campbell, 2017). By "narcissism," we here mean its standard form—agentic or *grandiose narcissism*—as opposed to its other postulated forms, such as pathological, vulnerable, or communal narcissism (Miller et al., 2010). Like self-esteem, grandiose narcissism is conceptualized as a continuously distributed trait (Miller & Campbell, 2010), and the two are distinguishable both conceptually (Brummelman, Thomaes, & Sedikides, 2016) and empirically (Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004). Whereas sociometer theory focuses on one type of self-regard, self-esteem, hierometer theory focuses on both, self-esteem and narcissism. Third, we employ the term "interpersonal behavior" to cover behavior falling along the two primary dimensions of the agency-communion circumplex (Abele & Wojciszke, 2014; Moskowitz, 1994; Wiggins, 1991): dominance-submission, labeled *assertiveness*; and friendliness-quarrelsomeness, labeled *affiliativeness*. Whereas hierometer theory focuses on assertiveness, sociometer theory focuses on affiliativeness.

The study of within-person variability in social relations, self-regard, and interpersonal behavior is important for several reasons. First, although people behave fairly consistently over time, they also show considerable variation in their day-to-day behavior (Fleeson, 2001; Moskowitz & Zuroff, 2004). For example, the extent to which people behave assertively or affiliatively varies across days (Markey et al., 2015; Moskowitz & Zuroff, 2005). Likewise, people's self-esteem and narcissism vary across days (Giacomin & Jordan, 2016a, 2016b; Kernis, 2005). Hence, the study of such fluctuations contributes to a more comprehensive and nuanced understanding of psychosocial dynamics as a whole (Bleidorn, 2009; Fournier, Moskowitz, & Zuroff, 2008; La Guardia, Ryan, Couchman, & Deci, 2000; Mischel, 2004), just like the study of short-term fluctuations in weather (e.g., cloud formation) contributes to an understanding of atmospheric dynamics beyond the study of long-term climate (e.g., global warming).

Second, this within-person variability is not simply random error; rather, it correlates meaningfully with important outcomes. That is, the study of within-person variability adds predictive validity (Kernis, 2005), often due to the presence of situation-specific triggers (Fleeson, 2007; Mischel, Shoda, & Mendoza-Denton, 2002). For example, Lee (2014) found that daily variability in self-esteem, but not level of self-esteem, predicted different types of aggressiveness in children—specifically, higher levels of reactive aggression, but lower levels of proactive aggression.

Third, the study of within-person variability is important because findings at the between-person level do not necessarily replicate at the within-person level (Wilson, Thompson, & Vazire, 2017). Indeed, the fallacious presumption that they should do so is one version of the *ecological fallacy* (Piantadosi, Byar, & Green, 1988). By way of analogy, consider typing speed (Hamaker, 2012). At the between-person level, typists who type faster also type more accurately. This is because individual differences in typing ability produce a positive correlation between typing speed

and typing accuracy. However, at the within-person level, a given typist, when typing faster, will type less accurately; that is, a negative correlation emerges instead between typing speed and typing accuracy. This is because typing faster undermines typing accuracy (Heitz, 2014). Thus, the correlation between typing speed and typing accuracy can differ—indeed, even reverse—depending on whether one investigates it at the between-person level or at the within-person level. Hence, there is no substitute for empirically investigating within-person variability in its own right.

This concern—that between-person and within-person patterns of association have no reason to be identical—is not merely a statistical issue. It also has important theoretical implications. Both sociometer theory and hierometer theory posit that self-regard functionally tracks social inclusion/status, respectively. But track relative to what? Implicitly (and sometimes explicitly), these theories invoke within-person associations (i.e., a given person having higher inclusion/status on some occasions than on others). Yet, empirical tests of these theories have largely focused on between-person differences, as though individuals evaluate their level of inclusion/status relative to the distribution of these variables in the sample or population at large. Here, we addressed this gap. We examined, for the first time, (a) how daily fluctuations in status and inclusion relate to daily fluctuations in self-regard (i.e., self-esteem and narcissism), and (b) how daily fluctuations in self-regard relate to daily fluctuations in interpersonal behavior (i.e., assertiveness and affiliativeness). Below, we describe sociometer theory and hierometer theory and the rationale for our hypotheses.

1.2 | Sociometer theory and hierometer theory: Theoretical overview

Sociometer theory (Leary, Tambor, Terdal, & Downs, 1995) links self-esteem to the need for inclusion (or equivalently, the "need to belong;" Baumeister & Leary, 1995). Maintaining inclusion in social groups was arguably essential to the survival and reproduction of ancestral humans. When a particular need (e.g., for water) is essential, one or more systems (e.g., thirst) is liable to evolve to regulate its satisfaction (Barkow, Cosmides, & Tooby, 1992). Sociometer theory posits that self-esteem is part of one such system (Leary & Baumeister, 2000).

More specifically, self-esteem may be characterized as serving two interrelated functions—*indicative* and *imperative*. (The term "indicative"—from the Latin *indicare* "to point out"—refers to how some psychological variable informs a person that their environment has some particular features. The term "imperative"—from the Latin *imperare* "to command"—refers to how some psychological variable impels a person to behave in particular ways.) For example, thirst functions both indicatively to inform people that they are H_20 deprived, and imperatively to impel people to take a drink. Sociometer theory holds that the indicative function of self-esteem is to operate as a subjective gauge that tracks inclusion. Thus, lower inclusion should undermine self-esteem, whereas higher inclusion should bolster it. In addition, sociometer theory holds that the imperative function of self-esteem is to adaptively regulate inclusion-seeking behavior. Thus, lower self-esteem, tracking lower inclusion, should motivate individuals to affiliate more strongly, to restore their inclusion level to an optimal state, whereas higher self-esteem, tracking higher inclusion, should not do so, as the need for inclusion has already been met. Putting both functions together, sociometer theory holds that lower or higher levels of social inclusion, respectively, serve to reduce or increase levels of self-esteem, which in turn, serve to provoke greater or lesser levels of behavioral affiliation, respectively (Leary, 2004).

It merits mention here that sociometer theory comes in two versions (see Mahadevan, Gregg, Sedikides, & De Waal-Andrews, 2016, for additional discussion). Its original version emphasizes social inclusion specifically: Self-esteem is a "marker of the degree to which the individual is being included versus excluded by other people" (Leary et al., 1995, p. 519). A later version instead emphasizes how self-esteem tracks people's "relational value" more generally—the degree to which they are regarded by others as valuable or important overall (e.g., Leary, 2005, p. 82). Notably, neither version explicitly articulates a role for status. However, the advantage of the original version is its theoretical precision: It clearly delineates an inclusion-regulating function for self-esteem. In contrast, the later version is theoretically less precise: It can be reasonably interpreted as subsuming any characteristic whatsoever that affords others some value, including, for example, gender-specific mating success (Schmitt & Jonason, 2019). Accordingly, because the original version of sociometer theory is more specific than the later version, and because the original version has been empirically tested most frequently (Leary, 2005), we use it to derive our hypotheses.

Hierometer theory, in contrast, links self-regard to the need for status (Anderson et al., 2015). In particular, it posits that self-regard is part of an evolved system that helps people to navigate status hierarchies adaptively (Mahadevan, Gregg, & Sedikides, 2019a, 2019b; Mahadevan et al., 2016). Like sociometer theory, hierometer theory holds that self-regard serves two interrelated functions, indicative and imperative. First, it holds that the indicative function of self-regard is to operate as subjective gauge that tracks status. Thus, lower status should undermine self-regard, whereas higher status should bolster it. Second, hierometer theory holds that the imperative function of self-regard is to adaptively regulate status-seeking behavior. However, the dynamics of hierometer theory diverge from those of sociometer theory. Status,

unlike inclusion, is a rivalrous good (Cornes & Sandler, 1986). That is, whereas everyone in a group can simultaneously fit in, not everyone in a group can simultaneously stand out. Accordingly, individuals must compete for status, and may lose as well as win such competitions. It follows that status should be sought judiciously rather than indiscriminately: It is not adaptive to compete when one is liable to lose, nor to back down when one is liable to win (Gregg, Mahadevan, & Sedikides, 2017a). Furthermore, all else equal, a track record of winning is liable to predict future wins. Hence, prior higher status, by raising the likelihood of winning, makes assertive status-promoting behavior more optimal, whereas prior lower status, by lowering the likelihood of winning, makes acquiescent status-protective behavior more optimal. Thus, the imperative function of self-regard, according to hierometer theory, operates as follows: lower self-regard, tracking lower status, motivates individuals to behave less assertively, whereas higher self-regard, tracking higher status, motivates them to behave more assertively. Putting both functions together, hierometer theory holds that lower or higher levels of social status, respectively, serve to reduce or increase levels of self-regard, which in turn, serve to provoke lesser or greater levels of behavioral assertiveness, respectively.

In summary, both sociometer and hierometer theory posit that self-regard serves a regulatory function. However, whereas sociometer theory pertains to social inclusion, hierometer theory pertains to social status. In addition, whereas sociometer theory focuses on one form of self-regard—self-esteem—hierometer theory focuses on two—self-esteem and narcissism. Finally, whereas sociometer theory articulates how more affiliative behavior might adaptively compensate for lower levels of inclusion, hierometer theory articulates how less or more assertive behavior might adaptively consolidate both lower and higher levels of status. Ultimately, the two theories may be integratively understood in terms of the overarching agency-communion distinction. Known as the "Big Two," agency and communion constitute two basic dimensions in social cognition, embracing competence-warmth, independence-interdependence, individualism–collectivism, and competition-cooperation (Abele & Wojciszke, 2014). We consider status and assertiveness to fall under the superordinate dimension of agency, and inclusion and affiliativeness to fall under the superordinate dimension of communion. Put another way, then, hierometer theory deals with self-regard's agentic function, sociometer theory with its communal one.

Putting both theories together, we can jointly frame our postulates as follows. On the one hand, we hypothesize that self-esteem operates as both hierometer and sociometer—tracking both status and inclusion, and motivating both assertive and affiliative behavior. On the other hand, we hypothesize that narcissism operates chiefly as a hierometer—tracking status alone and motivating assertive behavior alone. Several lines of research converge to make this framing plausible. For example, narcissists rate themselves as better-than-average on agentic traits (e.g., intelligence) but not on communal ones (e.g., morality), whereas high self-esteem individuals rate themselves as better-than-average on both (Bosson et al., 2008; Campbell, Rudich, & Sedikides, 2002; Krizan & Bushman, 2011). Additionally, at the level of between-person differences, higher status and higher inclusion each independently predict higher self-esteem, whereas higher status alone (but not inclusion) independently predicts higher narcissism (Mahadevan et al., 2016, 2019a, 2019b). Finally, narcissism has been linked to the pursuit of status both theoretically and empirically (Grapsas, Brummelman, Back, & Denissen, 2019; Zeigler-Hill et al., 2019).

1.3 | Sociometer theory and hierometer theory: Empirical evidence

Earlier, we gave several reasons why it is relevant to examine within-person variability: that such variability is (a) substantial in itself, (b) independently predictive, and (c) nonredundant with between-person variability. In addition, (d) sociometer theory and hierometer theory have so far been tested mainly at the between-person level. As the previous section outlines, both theories posit that psychological self-regard tracks people's social relations so as to regulate their interpersonal behavior. But the question naturally arises: track them relative to what? The most intuitive answer is: track them relative to other occasions on which their inclusion or status were either higher, lower, or the same. That is, both theories primarily invoke, as the basis of their fundamental dynamics, within-person comparisons in which one temporary state of affairs is weighted against another. Indeed, sociometer theory and hierometer theory might be held to apply most naturally in such situations. Few studies, however, have tested sociometer theory (Denissen, Penke, Schmitt, & Van Aken, 2008; Reitz, Motti-Stefanidi, & Asendorpf, 2016; Srivastava & Beer, 2005), and none have tested hierometer theory, at the within-person level.

Sociometer theory has been tested mainly at the between-person level. Providing good support for its hypothesized indicative function, studies show that socially included people subsequently report higher state self-esteem than socially excluded ones (Bourgeois & Leary, 2001; Buckley, Winkel, & Leary, 2004). Additionally, people who feel that others generally like and accept them report higher trait self-esteem than people who feel that others generally dislike and reject them (Leary & Macdonald, 2003; Macdonald, Saltzman, & Leary, 2003). Providing mixed support for its hypothesized imperative function, however, some studies show that social exclusion and low self-esteem prompt affiliative behavior, whereas other studies do not. On the one

hand, socially excluded people are more likely to conform to group opinions (Williams et al., 2000) and to report a greater desire for social connection (Maner, DeWall, Baumeister, & Schaller, 2007). On the other hand, socially excluded people are more likely to be hostile and aggressive (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007) and low self-esteem individuals are less likely to initiate new relationships than high self-esteem individuals (Anthony, Wood, & Holmes, 2007).

A few studies have tested sociometer theory at the within-person level. For example, Denissen et al. (2008) found that people reported higher self-esteem on days when they felt more included by others. Likewise, Srivastava and Beer (2005) and Reitz et al. (2016) found that others' liking and peer-perceived popularity predicted higher self-esteem. However, these studies did not test sociometer theory's imperative function—that is, how within-person fluctuations in daily inclusion and daily self-esteem relate to within-person fluctuations in daily affiliativeness. Furthermore, they were not designed to test hierometer theory, so they did not assess nor control for daily status and daily assertiveness.

Given its relative novelty, hierometer theory has so far only been tested at the between-person level. In support of its hypothesized indicative function, individuals led to believe that others respect and admire them subsequently report higher levels of state self-esteem and narcissism (Gregg et al., 2018; Mahadevan et al., 2019a). In addition, individuals who perceive that others, on average, respect and admire them (i.e., accord them higher status) report higher levels of trait self-esteem and narcissism (Mahadevan et al., 2016, 2019b). Moreover, in support of its hypothesized imperative function, higher trait self-esteem and narcissism both correlate positively with assertive behavior (Mahadevan et al., 2016). However, hierometer theory remains to be tested at the within-person level.

In sum, few studies have tested sociometer theory, and none have tested hierometer theory, at the within-person level. Thus, how within-person fluctuations in daily status and inclusion relate to within-person fluctuations in daily self-regard and interpersonal behavior remains to be established.

1.4 | The current research

Here, for the first time, we concurrently tested hypotheses from both sociometer and hierometer theory at the within-person level. We employed a daily diary design over a 10-day period and analyzed the data using multilevel modeling. By means of carefully crafted enquiries, we examined (a) how daily fluctuations in social relations (i.e., status and inclusion) related to daily fluctuations in self-regard (i.e., self-esteem and narcissism), and (b) how daily fluctuations in self-regard related to daily fluctuations in interpersonal behavior (i.e., assertiveness and affiliativeness). Furthermore, we additionally analyzed all these relationships once between-person trait-level individual differences in the same constructs were taken into account, in order to isolate within-participant variability specifically (cf. Lee, 2014).

In accord with hierometer theory, we hypothesized that, (i) on days when participants' status was higher (vs. lower), they would show higher (vs. lower) self-esteem and narcissism, and (ii) on days when participants' self-esteem and narcissism were higher (vs. lower), they would behave more (vs. less) assertively. In accord with sociometer theory, we hypothesized that, (iii) on days when participants' inclusion was higher (vs. lower), they would show higher (vs. lower) self-esteem, and (iv) on days when participants' self-esteem was higher (vs. lower), they would behave less (vs. more) affiliatively.

Furthermore, we investigated the mediating role of self-regard. In accord with hierometer theory, we hypothesized that (v) daily fluctuations in both self-esteem and narcissism would statistically mediate the link between daily fluctuations in status and daily fluctuations in assertiveness. In accord with sociometer theory, we hypothesized that (vi) daily fluctuations in self-esteem, but not narcissism, would statistically mediate the link between daily fluctuations in inclusion and daily fluctuations in affiliativeness.

2 | METHOD

2.1 | Participants and procedure

Participants initially completed a baseline survey online on their computer or mobile phone. Thereafter, every day, for the next 10 days, they completed short daily surveys, also online, and on their computer or mobile phone. All the surveys were hosted on the *Qualtrics*^{TM} platform. The link to each daily survey was emailed to participants at 4 p.m. each day, followed by a reminder at 9 p.m. each day.

The study—open to all adults (18+) fluent in English—was advertised on University notice boards and via a research recruitment intranet. Participants comprised psychology students taking part for course credit as well as nonstudent volunteers (relative numbers unknown). A total of 415 participants completed at least one survey, resulting in 2,582 observations. Of these, 325 participants (244 women, 80 men, and 1 unreported) completed the baseline survey. They ranged in age from 18 to 66 years ($M = 25.84$, $SD = 9.89$). Their ethnic backgrounds were: White (46.5%), South Asian (12.6%), East Asian (11.7%), Hispanic (11.7%), Black (9.5%), and Other (8.0%). On average, participants completed 5.43 daily surveys (Median = 7.00, $SD = 4.13$).[1] This sample size allowed us to detect small-to-medium effects (range $r = .07$ to .18) with a high power of $(1 - \beta) = .95$ at $\alpha = .05$ (two-tailed).

2.2 | Baseline measures

Participants completed the following measures as part of the baseline survey. We averaged item scores for all measures, with higher scores indicating higher levels of the corresponding construct.

2.2.1 | Status

Participants completed an 8-item social status measure (Huo, Binning, & Molina, 2010; Mahadevan et al., 2016, 2019a, 2019b). It began with the stem, "Most of the time I feel that people..." Sample items include: "…respect my achievements," "…admire me," and "…see me as an important person" (1 = *strongly disagree*, 5 = *strongly agree*; $M = 3.36$; $SD = 0.66$; $\alpha = .89$).

2.2.2 | Inclusion

Participants completed a parallel 9-item social inclusion measure (Huo et al., 2010; Mahadevan et al., 2016, 2019a, 2019b). It began with the same stem as above. Sample items include: "…like me as a person," "…feel warmly towards me," and "…accept me" (1 = *strongly disagree*, 5 = *strongly agree*; $M = 3.85$; $SD = 0.56$; $\alpha = .89$).

2.2.3 | Self-esteem

Participants completed the *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965). The RSES comprises 10 items, five worded positively and five worded negatively. Sample items include: "On the whole, I am satisfied with myself," and "At times I think I am no good at all (reverse-scored)" (1 = *strongly disagree*, 5 = *strongly agree*; $M = 3.48$; $SD = 0.70$; $\alpha = .87$).

2.2.4 | Narcissism

Participants completed the 40-item *Narcissistic Personality Inventory* (NPI; Raskin & Terry, 1988; $M = 3.10$; $SD = 0.57$; $\alpha = .87$). Its original items consist of pairs of statements—narcissistic versus non-narcissistic—which respondents choose between (e.g., "I think I am a special person" vs. "I am no better or worse than most people"). Here, we retained the item content, but altered the response format. In particular, we used a 6-point bipolar scale to capture degrees of endorsement of one statement versus the other. The narcissistic statement in each pair appeared on one end of the scale, and the non-narcissistic statement appeared on the other. The absence of a scale mid-point retained the "trade-off" feature of the original NPI while affording the possibility of more sensitive measurement (Gregg, Mahadevan, & Sedikides, 2017b; Lee, Gregg, & Park, 2013). Other researchers have adopted similar formats when assessing narcissism (Pincus et al., 2009), and found them psychometrically superior to the standard paired-item format (Grosz et al., 2017).

2.2.5 | Assertiveness and affiliativeness

Participants completed the 48-item *Social Behavior Inventory* (SBI; Moskowitz, 1994; 1 = *very unlike me*, 6 = *very like me*). The SBI assesses interpersonal behavior along two dimensions: assertiveness (ranging from dominance to submissiveness) and affiliativeness (ranging from friendliness to quarrelsomeness). It consists of four 12-item subscales that measure dominant, submissive, friendly, and quarrelsome behavior, respectively. Sample items are: "I speak in a clear, firm voice" (dominant), "I do not express disagreement" (submissive), "I compliment or praise other people" (friendly), and "I criticise others" (quarrelsome). The SBI's reliability and validity has been demonstrated in a variety of contexts (Moskowitz, 1994). All four subscales proved reliable (dominance: $\alpha = .81$; submissiveness: $\alpha = .88$; friendliness: $\alpha = .86$; quarrelsomeness: $\alpha = .84$). In accord with previous practice (Mahadevan et al., 2016; Moskowitz & Zuroff, 2005; Roche, Pincus, Hyde, Conroy, & Ram, 2013), and the standard circumplex models (Moskowitz, 1994; Wiggins, 1991), we operationalized behavioral assertiveness by subtracting mean scores on the submissiveness subscale from those on the dominance subscale ($M = 0.54$; $SD = 1.32$), and behavioral affiliativeness by subtracting mean scores on the quarrelsomeness subscale from those on the friendliness subscale ($M = 1.91$; $SD = 1.15$).

2.3 | Daily diary measures

Participants completed the following daily diary measures. They received the instruction: "Now, we would like you to reflect upon your day today. Think about what occurred and how you felt and acted. There are no right or wrong answers. Please answer honestly. Your responses are strictly confidential."

2.3.1 | Status

Participants indicated their daily status by reporting whether a series of status-relevant events had occurred on that day (cf. Giacomin & Jordan, 2016a; Huo et al., 2010). The events were: "Were you assigned to an important role in a group?",

"Did you receive any recognition?", "Did you feel that people respected you?", "Did you feel that someone admired you?", "Did people treat you as someone important?", "Did people seem to think highly of your abilities and talents?", and "Did you feel that people saw you as someone successful?" Responses were dichotomous (1 = *yes*, 0 = *no*; $M = 0.58$, $SD = 0.34$, $\alpha_{mean} = .83$, $\alpha_{range} = .76–.87$).[2]

2.3.2 | Inclusion

Likewise, participants indicated their daily inclusion by reporting whether a series of inclusion-relevant events had occurred that day (cf. Giacomin & Jordan, 2016a; Huo et al., 2010). The events were: "Did people include you in their social groups and activities?", "Were people friendly towards you?", "Did you feel that people liked you?", "Did you feel accepted by others?", "Did you feel like you fitted in?", "Did people seem to feel warmly towards you?" and "Did people seem to see you as a nice person?" Responses were dichotomous (1 = *yes*, 0 = *no*; $M = 0.89$, $SD = 0.23$, $\alpha_{mean} = .86$, $\alpha_{range} = .81–.91$).

2.3.3 | Self-esteem

Participants indicated their daily self-esteem on three items (Mahadevan, Gregg, & Sedikides, 2020; Robins, Hendin, & Trzesniewski, 2001; $M = 5.51$, $SD = 1.63$, $\alpha_{mean} = .94$, $\alpha_{range} = .91–.96$). The items were: "How do you feel about yourself?" (1 = *very negative*, 8 = *very positive*), "How do you feel about yourself?" (1 = *very bad*, 8 = *very good*), and "I have high self-esteem" (1 = *strongly disagree*, 8 = *strongly agree*). These items assess state self-esteem reliably and validly (Mahadevan et al., 2020; Robins et al., 2001).

2.3.4 | Narcissism

Participants indicated their daily narcissism on 11 adjectives (Giacomin & Jordan, 2016b; $M = 2.34$, $SD = 1.06$, $\alpha_{mean} = .91$, $\alpha_{range} = .87–.93$). The adjectives were: egotistical, self-focused, vain, manipulative, attention-seeking, arrogant, narcissistic, self-centered, conceited, self-indulgent, and selfish (1 = *strongly disagree*, 7 = *strongly agree*). These items assess state narcissism reliably and validly (Giacomin & Jordan, 2016b).

2.3.5 | Assertiveness

Participants indicated how assertively they had behaved that day (cf. Moskowitz, 1994). The assertive behaviors were: "I spoke in a clear, firm voice," "I took the lead in planning or organizing a project or activity," "I made suggestions," "I asked others to volunteer or assigned others to tasks," "I stood up for myself," "I formed my own opinions," "I stood firm in my decisions," "I made my own plans or decisions," and "I expressed my opinions." Responses were dichotomous (1 = *yes*, 0 = *no*; $M = 0.72$, $SD = 0.28$, $\alpha_{mean} = .83$, $\alpha_{range} = .75–.88$).

2.3.6 | Affiliativeness

Participants indicated how affiliatively they had behaved that day (cf. Moskowitz, 1994). The affiliative behaviors were: "I complimented or praised someone," "I smiled and laughed with others," "I expressed affection with words or gestures," "I showed sympathy," "I expressed reassurance," "I did something caring for someone else," "I helped someone with a problem." Responses were dichotomous (1 = *yes*, 0 = *no*; $M = 0.79$, $SD = 0.27$, $\alpha_{mean} = .79$, $\alpha_{range} = .67–.85$).

3 | RESULTS

3.1 | Data analytic strategy

The goals of this research were (a) to document whether and to what extent within-person fluctuations in three types of variable—social relations, self-regard, and interpersonal behavior—existed, and (b) to examine whether and to what extent these within-person fluctuations corresponded with hypotheses derived from sociometer theory and hierometer theory. Accordingly, we were interested in how, over the course of several days, status, inclusion, self-esteem, narcissism, assertiveness, and affiliativeness (a) varied within-person and (b) covaried within-person. We did not hypothesize specific trends over time (e.g., a linear or quadratic increase in status or inclusion as days progressed), nor we formulate hypotheses regarding the durability or time-onset of effects (e.g., the impact of status or inclusion on self-esteem from one day to the next).[3] Accordingly, multilevel modeling (MLM) represented the most appropriate tool to test our hypotheses (as opposed to, say, cross-lagged analyses or growth modeling). Its use was also consistent with past research addressing similar questions (Giacomin & Jordan, 2016a, 2016b; Heller, Komar, & Lee, 2007; Wilson et al., 2017). Furthermore, MLM allows for the analysis of all available data and is robust to missing data (weaknesses that can compromise other analytic techniques, such as cross-lagged analyses; Kearney, 2017; Snijders & Bosker, 2004).

We used random-intercept MLM analyses (Singer, 1998). The daily data (Level 1) were nested within participants (Level 2). These analyses allowed us to partition variance in a

dependent variable (e.g., self-esteem) at the between-person and within-person level. Between-person variance reflects the distribution of people's scores relative to the population average. Within-person variance, on the contrary, reflects the distribution of people's daily scores relative to their overall score. Specifically, random-intercept models, here illustrated with a single predictor, follow the structure[4]:

$$\text{Level 1} \quad Y_{ij} = \gamma_{0j} + \gamma_{10} X_{ij} + e_{ij}, \text{ where } e_{ij} \sim N\left(0, \sigma^2\right).$$

$$\text{Level 2} \quad \gamma_{0j} = \gamma_{00} + u_{0j}, \text{ where } u_{0j} \sim N\left(0, \tau^2\right).$$

We tested our hypotheses (i) through (vi) in four stages of increasing complexity, both without, and then, with covariates, as recommended by Simmons, Nelson, and Simonsohn (2011). First, we computed the zero-order within-person associations between the daily indices by regressing—in the aforementioned multilevel analysis—the relevant outcomes on the relevant predictors (i.e., each index of self-regard on each index of social relations; and each index of interpersonal behavior on each index of self-regard). Second, we recomputed each of these daily within-person associations after jointly controlling for the two concurrent daily indices (e.g., the daily status–daily narcissism association controlled for daily inclusion and daily self-esteem, and the daily narcissism–daily assertiveness association controlled for daily self-esteem and daily affiliativeness). Third, we again computed each of these daily within-person associations, but after further controlling for participants' baseline scores on the trait measures to see if within-person fluctuations in daily status and inclusion continued to predict fluctuations in daily self-regard and interpersonal behavior after accounting for baseline individual differences in these constructs (Geiser, 2013; Lee, 2014). Finally, we tested, using tests of multilevel mediation (Hayes, 2013), whether and to what extent daily fluctuations in self-esteem and narcissism mediated the association between daily fluctuations in status and assertiveness, and daily fluctuations in inclusion and affiliativeness. In all analyses, we controlled for measurement day (1 through 10) to account for the possibility that some days might be linked to different responses (e.g., people presenting themselves more favorably on the first day; Bolger & Laurenceau, 2013; Snijders & Bosker, 2004).

3.2 | Within-person variability

Before proceeding to the main analyses, we examined whether status and inclusion varied within-person over the 10-day period. Attesting to the potential importance of such within-person variability, a considerable proportion of the variance in both status and inclusion emerged within-person (status: 50%; inclusion: 60%). That is, participants experienced nontrivial fluctuations in their status and inclusion over relatively short periods of time. Likewise, and consistent with previous research (Giacomin & Jordan, 2016a, 2016b; Kernis, 2005; Markey et al., 2015), we observed considerable within-person variations in self-regard (self-esteem: 40%; narcissism: 27%) and interpersonal behavior (assertiveness: 93%; affiliativeness: 64%). Accordingly, our key constructs exhibited promising levels of within-person variability whose mutual interrelations could be profitably explored.

3.3 | Social relations and self-regard: Tests of indicative function

In the first set of analyses, we tested whether our data were consistent with the indicative function of self-regard postulated by sociometer and hierometer theory. Specifically, we tested using MLM whether daily fluctuations in status and inclusion related in the hypothesized way to daily fluctuations in self-esteem and narcissism (Table 1).

3.3.1 | Zero-order associations

Daily status covaried positively with daily self-esteem. It also did so with daily narcissism. Likewise, daily inclusion covaried positively with daily self-esteem. However, daily inclusion did not covary positively with daily narcissism. Thus, on days when their status was higher (vs. lower), participants manifested higher (vs. lower) self-esteem and narcissism; however, on days when their inclusion was higher (vs. lower), participants manifested only higher (vs. lower) self-esteem (Table 1, upper panel).

3.3.2 | Adjusted associations I

Next, we examined the same four associations—between each of the two daily indices of social relations and each of the two daily indices of self-regard—after simultaneously controlling for the other two daily indices. The same pattern of findings emerged (Table 1, middle panel).

3.3.3 | Adjusted associations II

Subsequently, we added a further layer of statistical adjustment. Specifically, we examined the above set of adjusted associations, but after additionally controlling for participants' baseline scores on the trait measures of status, inclusion, self-esteem, and narcissism. Regardless, the same pattern of findings persisted (Table 1, bottom panel).

TABLE 1 MLM analyses of the within-person associations between daily status, daily inclusion, daily self-esteem, and daily narcissism

Covariates	Variables	*γ*	*SE*	*t*	*p*	95% CI	Effect size (*r*)
None	Daily status–daily self-esteem	1.82	0.09	21.11	<.001	[1.65, 1.99]	.42
	Daily status–daily narcissism	0.13	0.05	2.68	.007	[0.04, 0.23]	.10
	Daily inclusion–daily self-esteem	2.34	0.11	20.48	<.001	[2.11, 2.56]	.44
	Daily inclusion–daily narcissism	0.03	0.07	0.44	.657	[−0.10, 0.16]	.01
Daily indices[a]	Daily status–daily self-esteem	1.33	0.09	14.70	<.001	[1.15, 1.50]	.28
	Daily status–daily narcissism	0.12	0.06	2.19	.029	[0.01, 0.24]	.09
	Daily inclusion–daily self-esteem	1.65	0.12	13.95	<.001	[1.42, 1.88]	.31
	Daily inclusion–daily narcissism	−0.07	0.07	−0.99	.321	[−0.22, 0.07]	.03
Daily indices & baselines[b]	Daily status–daily self-esteem	1.28	0.09	13.65	<.001	[1.10, 1.47]	.25
	Daily status–daily narcissism	0.11	0.06	1.82	.069	[−0.01, 0.22]	.05
	Daily inclusion–daily self-esteem	1.57	0.12	12.93	<.001	[1.33, 1.81]	.27
	Daily inclusion–daily narcissism	−0.04	0.08	−0.50	.619	[−0.19, 0.11]	.00

[a]Controlling for daily covariation in the other two concurrently assessed daily indices. For example, the association between daily status and daily self-esteem controlled for daily inclusion and daily narcissism.

[b]Additionally controlling for between-person trait levels of all four indices assessed at baseline (i.e., baseline status, inclusion, self-esteem, and narcissism).

3.3.4 | Discussion

Supporting hierometer theory, on days when participants' status was higher (vs. lower), their self-esteem and narcissism were too. Supporting sociometer theory, on days when participants' inclusion was higher (vs. lower), their self-esteem was too.[5] These patterns held both with and without controlling for the other daily indices and for baseline traits. Thus, hypotheses (i) and (iii) were confirmed at the within-person level. These findings conceptually replicate previous ones obtained at the between-person level (Mahadevan et al., 2016, 2019a, 2019b).

3.4 | Self-regard and interpersonal behavior: Tests of imperative function

In the second set of analyses, we tested whether our data were consistent with the imperative function of self-regard postulated by sociometer and hierometer theory. Specifically, we tested using MLM whether daily fluctuations in self-esteem and narcissism related in the hypothesized way to daily fluctuations in assertiveness and affiliativeness (Table 2).

3.4.1 | Zero-order associations

Daily self-esteem covaried positively with daily assertiveness. So too did daily narcissism. Daily self-esteem covaried positively with daily affiliativeness. However, daily narcissism did not covary positively with daily affiliativeness. Thus, on days when their self-esteem or narcissism were higher (vs. lower), participants showed higher (vs. lower) assertiveness; however, only on days when their self-esteem was higher (vs. lower), did participants show higher (vs. lower) affiliativeness (Table 2, upper panel).

3.4.2 | Adjusted associations I

Next, we examined the same four associations—between each of the two daily indices of self-regard and each of the

TABLE 2 MLM analyses of the within-person associations between daily self-esteem, daily narcissism, daily assertiveness, and daily affiliativeness

Covariates	Variables	γ	*SE*	*t*	*p*	95% CI	Effect Size (*r*)
None	Daily self-esteem–daily assertiveness	0.07	0.004	19.62	<.001	[0.07, 0.08]	.42
	Daily narcissism–daily assertiveness	0.04	0.01	5.38	<.001	[0.03, 0.05]	.11
	Daily self-esteem–daily affiliativeness	0.07	0.01	17.41	<.001	[0.06, 0.07]	.34
	Daily narcissism–daily affiliativeness	0.01	0.01	0.93	.355	[−0.01, 0.02]	.00
Daily indices[a]	Daily self-esteem–daily assertiveness	0.05	0.004	13.40	<.001	[0.04, 0.06]	.30
	Daily narcissism–daily assertiveness	0.03	0.01	5.27	<.001	[0.02, 0.04]	.12
	Daily self-esteem–daily affiliativeness	0.04	0.004	9.98	<.001	[0.03, 0.05]	.14
	Daily narcissism–daily affiliativeness	−0.01	0.01	−1.84	.066	[−0.02, 0.001]	.05
Daily indices & baselines[b]	Daily self-esteem–daily assertiveness	0.05	0.004	11.17	<.001	[0.04, 0.05]	.23
	Daily narcissism–daily assertiveness	0.03	0.01	4.21	<.001	[0.01, 0.04]	.07
	Daily self-esteem–daily affiliativeness	0.04	0.004	9.46	<.001	[0.03, 0.05]	.14
	Daily narcissism–daily affiliativeness	−0.01	0.01	−1.56	.119	[−0.02, 0.003]	.05

[a]Controlling for daily covariation in the two concurrently assessed daily indices. For example, the association between daily self-esteem and daily assertiveness controlled for daily narcissism and daily affiliativeness.

[b]Additionally controlling for between-person trait levels of all four indices assessed at baseline (i.e., baseline self-esteem, narcissism, assertiveness, and affiliativeness).

two daily indices of interpersonal behavior—after simultaneously controlling for the other two daily indices. The same pattern of findings emerged (Table 2, middle panel).

3.4.3 | Adjusted associations II

Again, we added a further layer of statistical adjustment. Specifically, we examined the above set of adjusted associations, but after additionally controlling for participants' baseline scores on the trait measures of self-esteem, narcissism, assertiveness, and affiliativeness. Regardless, the same pattern of findings persisted (Table 2, bottom panel).

3.4.4 | Discussion

Supporting hierometer theory, on days when participants' self-esteem and narcissism were higher (vs. lower), their assertiveness was higher (vs. lower) too. However, contradicting sociometer theory, on days when participants' self-esteem was higher (vs. lower), their affiliativeness was too (the inverse pattern being expected). These patterns held both with and without controlling for the other daily indices and for baseline traits. Thus, hypothesis (ii) was confirmed at the within-person level, whereas hypothesis (iv) was not. However, the reversed pattern obtained for self-esteem and affiliativeness is still potentially consistent with self-esteem serving some indicative function. These findings conceptually replicate previous ones obtained at the between-person level (Mahadevan et al., 2016, 2019a, 2019b).

3.5 | Mediations by self-regard: Joint tests of indicative and imperative functions

In the final set of analyses, we used multilevel mediation (Hayes, 2013) to examine how daily fluctuations in social relations, self-regard, and interpersonal behavior interrelate. We tested whether (a) there existed any links between daily fluctuations in social relations and daily fluctuations in interpersonal behavior, and (b) whether such links

could be accounted for by daily fluctuations in self-regard. Specifically, we tested whether the daily status–daily assertiveness link was statistically mediated by daily self-esteem and daily narcissism—hypothesis (v); and whether the daily inclusion–daily affiliativeness link was statistically mediated by daily self-esteem, but not by daily narcissism—hypothesis (vi).

3.5.1 | Did self-esteem mediate the link between status and assertiveness?

Daily fluctuations in status covaried positively with daily fluctuations in assertiveness. Furthermore, daily fluctuations in assertiveness covaried positively with daily fluctuations in self-esteem independently of daily fluctuations in status, $\gamma = 0.04$, $SE = 0.004$, $t(2,249) = 11.20$, $p < .001$, 95% CI [0.03, 0.05], and vice versa, $\gamma = 0.37$, $SE = 0.02$, $t(2,249) = 21.35$, $p < .001$, 95% CI [0.33, 0.40]. As a final step, we tested the indirect effect of status (the predictor) on assertiveness (the outcome) via self-esteem (the potential mediator). We treated paths *a* (predictor-to-mediator) and *b* (mediator-to-outcome) as fixed effects and used the MCMED macro (Hayes, 2013) to construct 95% Monte Carlo confidence intervals (CI) for the indirect effect. Crucially, the indirect path *ab*—quantifying mediation by self-esteem—attained significance, $ab = 0.08$, 95% CI = [0.06, 0.09].[6] This finding supports hierometer theory.

3.5.2 | Did narcissism mediate the link between status and assertiveness?

As noted above, daily fluctuations in status covaried positively with daily fluctuations in assertiveness. Furthermore, daily fluctuations in assertiveness covaried positively with daily fluctuations in narcissism independently of daily fluctuations in status, $\gamma = 0.02$, $SE = 0.01$, $t(2,249) = 3.69$, $p < .001$, 95% CI [0.01, 0.03], and vice versa, $\gamma = 0.44$, $SE = 0.02$, $t(2,249) = 27.34$, $p < .001$, 95% CI [0.41, 0.47]. Crucially, the indirect effect—quantifying mediation by narcissism—attained significance, $ab = 0.003$, 95% CI = [0.005, 0.006]. This finding again supports hierometer theory.

3.5.3 | Did self-esteem mediate the link between inclusion and affiliativeness?

Daily fluctuations in inclusion covaried positively with daily fluctuations in affiliativeness, $\gamma = 0.46$, $SE = 0.02$, $t(2,250) = 20.79$, $p < .001$, 95% CI [0.42, 0.51]. Furthermore, daily fluctuations in affiliativeness covaried positively with daily fluctuations in self-esteem independently of daily fluctuations in inclusion, $\gamma = 0.04$, $SE = 0.004$, $t(2,249) = 10.66$, $p < .001$, 95% CI [0.03, 0.05], and vice versa, $\gamma = 0.36$, $SE = 0.02$, $t(2,249) = 14.92$, $p < .001$, 95% CI [0.31, 0.40]. Crucially, the indirect effect—quantifying mediation by self-esteem—attained significance, $ab = 0.10$, 95% CI = [0.08, 0.12]. This finding provides qualified support for sociometer theory as self-esteem mediated the inclusion–affiliativeness link, but the pattern obtained was directionally opposite to that hypothesized by sociometer theory.

3.5.4 | Did narcissism mediate the link between inclusion and affiliativeness?

As noted above, daily fluctuations in inclusion covaried positively with daily fluctuations in affiliativeness. However, daily fluctuations in affiliativeness did not covary positively with daily fluctuations in narcissism independently of daily fluctuations in inclusion, $\gamma = -0.69$, $SE = 0.01$, $t(2,249) = 0.99$, $p = .321$, 95% CI [−0.01, 0.02]. In contrast, daily fluctuations in affiliativeness still covaried positively with daily fluctuations in inclusion independently of daily fluctuations in narcissism, $\gamma = 0.46$, $SE = 0.20$, $t(2,249) = 20.75$, $p < .001$, 95% CI [0.42, 0.51]. Crucially, the indirect effect—quantifying mediation by narcissism—did not attain significance, $ab = 0.01$, 95% CI = [−0.001, 0.002]. This finding neither supports nor contradicts sociometer theory, to the extent that sociometer theory does not ascribe a functional role to narcissism.

3.5.5 | Discussion

Supporting hierometer theory, on days when participants' status was higher (vs. lower), their assertiveness was higher (vs. lower) too. In addition, daily fluctuations in both self-esteem and narcissism mediated the link between daily fluctuations in status and daily fluctuations in assertiveness. This supports hierometer theory, and confirms hypothesis (v). Contradicting sociometer theory, on days when participants' inclusion was higher (vs. lower), their affiliativeness was higher (vs. lower) too (the inverse pattern being expected). In addition, daily fluctuations in self-esteem, but not narcissism, mediated the link between daily fluctuations in inclusion and daily fluctuations in affiliativeness. This provides a qualified confirmation of hypothesis (vi), as the pattern of mediation obtained was directionally opposite to that expected by sociometer theory.

In general, our mediational findings provide evidence of self-regard serving a pair of interlinked indicative and imperative functions at the within-person level. This is because they establish that daily social relations relate to daily interpersonal behavior via daily self-regard—consistent with

self-regard acting as a crucial gear in the compensatory or consolidatory mechanisms postulated by hierometer theory and sociometer theory. Note that the mediational pattern obtained for self-esteem in relation to inclusion and affiliativeness is still potentially consistent with self-esteem serving some pair of interlinked indicative and imperative functions. These findings, moreover, conceptually replicate previous ones obtained at the between-person level (Mahadevan et al., 2016, 2019a, 2019b).

4 | GENERAL DISCUSSION

We set out to address the question: How do within-person fluctuations in daily social relations (i.e., status and inclusion) relate to within-person fluctuations in daily self-regard (i.e., self-esteem and narcissism) and to within-person fluctuations in daily interpersonal behavior (i.e., assertiveness and affiliativeness)? Work on status and inclusion has so far focused mainly on between-person differences in the two (i.e., how one person generally has higher status or is more included than another). In contrast, little work has examined within-person variations in both status and inclusion (i.e., how the same person has higher status or is more included on some occasions than on others), and how these within-person variations relate to self-regard and interpersonal behavior. Here, we remedied the deficiency: we systematically examined, for the first time, how these variables interrelate within-persons using a daily diary study, while taking care to scrupulously control for between-person baseline individual differences.

The advantages of doing so were fourfold. First, within-person variability is typically substantial in itself, and so worth examining in its own right to obtain a more comprehensive and nuanced understanding of psychosocial dynamics as a whole. Second, within-person variability is typically predictive of outcomes independently of between-person variability, attesting to its theoretical and empirical importance. Third, there is no guarantee that, just because a particular pattern of findings has emerged at the between-person level, it must also appear at the within-person level: independent investigation at the within-person level is required. Fourth, the two theories we used to derive our hypotheses—sociometer theory and hierometer theory—are arguably most immediately tested at the within-person level, by investigating how fluctuations in social relations, self-regard, and interpersonal behavior mutually covary across days.

4.1 | Summary of findings

Notably, our findings at the within-person level ended up conceptually replicating, in every single respect, previous findings at the between-person level (Mahadevan et al., 2016, 2019a, 2019b)—a result that could well have been otherwise. First, the hypotheses derived from hierometer theory were fully borne out. This theory posits that two types of self-regard, self-esteem and narcissism, serve a pair of functions—indicatively tracking status, and imperatively regulating assertiveness—such that higher status increases assertiveness by raising self-esteem and narcissism. This process involves a consolidatory dynamic (i.e., higher status motivates yet more status-seeking). Consistent with this account, (a) daily fluctuations in status covaried positively with daily fluctuations in self-esteem and narcissism; (b) daily fluctuations in self-esteem and narcissism covaried positively with daily fluctuations in assertiveness; and (c) daily fluctuations in self-esteem and narcissism each mediated the positive link between daily fluctuations in status and daily fluctuations in assertiveness.

Second, the hypotheses derived from sociometer theory were only partly borne out. This theory posits that one type of self-regard, self-esteem, serves a pair of functions—indicatively tracking inclusion, and imperatively regulating affiliativeness—such that lower inclusion increases affiliativeness by lowering self-esteem. This process involves a compensatory dynamic (i.e., lower inclusion motivates more remedial inclusion-seeking). Consistent with this account, (a) daily fluctuations in inclusion covaried positively with daily fluctuations in self-esteem. However, contrary to this account, (b) daily fluctuations in self-esteem covaried positively (rather than negatively) with daily fluctuations in affiliativeness; and (c) daily fluctuations in self-esteem mediated the positive (rather than negative) link between daily fluctuations in inclusion and daily fluctuations in affiliativeness.

4.2 | Implications

Our research makes several contributions to theory and research. First, it expands understanding of six constructs relevant to many research literatures. These are status and inclusion—both key types of social relations (Anderson et al., 2015; Baumeister & Leary, 1995); self-esteem and narcissism—both key types of self-regard (Brummelman et al., 2016); and assertiveness and affiliativeness—both key types of interpersonal behavior (Moskowitz, 1994). In particular, our research sheds light on how these variables both independently vary, and mutually covary, within-persons. We found that each of these variables exhibited substantial fluctuation across the span of 10 days. That is, people's social relations, self-regard, and interpersonal behavior all exhibited substantial day-to-day "weather," above and beyond any underlying "climate." These fluctuations, moreover, were meaningful: Fluctuations in people's daily status and inclusion related differently to their daily self-esteem and narcissism, as well as to their daily assertiveness and affiliativeness.

Second, our research has implications for contemporary theories of the function of self-regard. In particular, it furnishes a novel source of confirmation, at the within-person level, for hierometer theory, which posits that self-regard adjusts levels of assertiveness to accommodate current levels of status. All three variables—status, self-regard, and assertiveness—shifted together as expected (i.e., rising or falling together), with variation in self-regard statistically mediating the link between status and assertiveness, consistent with self-regard indicatively tracking the former and imperatively regulating the latter. Yet, as regards sociometer theory, which posits that self-esteem adjusts levels of affiliativeness to remediate lower levels of inclusion, our research furnished a novel source of both confirmation and disconfirmation at the within-person level. On the one hand, inclusion and self-esteem shifted together as expected (i.e., rising or falling together); on the other hand, both shifted together with affiliativeness directly counter to expectation (i.e., with affiliativeness failing to rise when both fell, and vice versa). Nonetheless, variation in self-esteem statistically mediated the link between inclusion and affiliativeness, consistent with self-esteem indicatively tracking the former and imperatively regulating the latter.

What plausible interpretation may be made of these mixed findings as regards sociometer theory? Note that, to the extent that self-esteem serves as the psychological gear that links inclusion to affiliativeness, the dynamic involved would seem to be—as in hierometer theory—consolidatory rather than compensatory. That is, people seemed to behave affiliatively on occasions when they felt more included, because their self-esteem had been buoyed up. If so, then it would be a rise, not a drop, in self-esteem, which would incline people toward more pronounced prosociality. Yet such a pattern may still make evolutionary sense. In particular, a prosocial individual who is reliably supportive of others—and is liked and accepted as a result—is thereafter more likely to receive reciprocal support from others (Axelrod, 1984; Trivers, 1971). In contrast, a nonsocial or antisocial individual who fails to support or who exploits others—and is disliked and rejected as a result—is more likely to be neglected or sanctioned under similar circumstances. For the latter individual, then, attempts at affiliation may prove pointless or perilous. Hence, it is conceivable that a system would evolve to suppress such counterproductive attempts, mediated by self-esteem. Note too, that that the underlying dynamic can also be construed as a risk-minimization maneuver, resembling evolutionary explanations which have been put forward to explain depression (Allen & Badcock, 2003). That is, people may only feel confident enough to affiliate with others and risk rejection when their self-esteem is high, not when it is low. Our current findings, therefore, join with past findings (Anthony et al., 2007; Mahadevan et al., 2016; Twenge et al., 2001, 2007) in offering a provocative empirical challenge to the imperative function of sociometer theory. True, some experimental research indicates that people faced with the prospect of social exclusion express greater interest in making new friends and working with others (Maner et al., 2007), and are also more likely to conform to group opinions as their self-esteem and sense of inclusion fall (Williams et al., 2000). However, other experimental research finds that socially excluded people act less prosocially than socially included ones (Twenge et al., 2001, 2007). In addition, longitudinal research finds that low trait self-esteem is a correlate of various types of antisocial behavior (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005). Accordingly, follow-up work could further address how self-esteem and affiliativeness relate functionally.

4.3 | Strengths, limitations, and future directions

The current research had several strengths. As mentioned above, it offered a pioneering exploration of how key variables varied and covaried within-person in light of theories pertaining to the function of self-regard. In addition, our methodological approach—a daily diary study—had several advantageous features. First, it was highly powered, featuring over 2,500 distinct observations. Second, it was ecologically valid, being conducted in a naturalistic setting. Third, it was conducted on a reasonably diverse sample, whose participants varied in terms of age, gender, ethnicity, and student/nonstudent status.

At the same time, the current research also had some limitations. Its design, not being experimental, did not permit the drawing of firm causal inferences. That is, the patterns of covariation and mediation that emerged were compatible, not only with the causal sequences specified by hierometer theory and sociometer theory, but also with reverse sequences. Nonetheless, hierometer theory and sociometer theory did hypothesize the emergence of some definite patterns rather than others (Spencer, Zanna, & Fong, 2005); and on that basis, there was ample scope for our findings to either corroborate those theories (as they did in the case of hierometer theory) or call them into question (as they partly did in the case of sociometer theory). It is also noteworthy that the findings we obtained corresponded closely with those previously found using both experimental and correlational designs (Mahadevan et al., 2016, 2019a, 2019b), suggesting that they are design-independent.

In addition, our daily diary measures involved self-report. As such, they were potentially subject to response biases, including social desirability, demand characteristics, and shared method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We took several steps to minimize such

biases. For example, we emphasized confidentiality in the study instructions. We also arranged for different measures to feature different response formats (e.g., dichotomous options for social relations and interpersonal behavior; continuous options for self-regard). Nonetheless, future research featuring observational methods or informant reports would be welcome.

Another potential limitation of our methodology concerns the number of measurement occasions used. Participants completed one survey per day for 10 days, with the average participant completing about five daily surveys. Although some researchers have adopted the same number of measurement occasions (Giacomin & Jordan, 2016a; Heller et al., 2007), others have included multiple observations per day over more days (Fleeson, 2001; Wilson et al., 2017), affording them both finer temporal resolution and extended duration. We deemed it prudent to measure our six constructs only once per day, with dichotomous options for some variables, to reduce the risk of participant fatigue; but in so doing, may also have failed to capitalize on all the fluctuations in our variables that were potentially available. Accordingly, future studies might use continuous response formats for all measures to avoid a loss of information. A related concern may be that, because not all participants completed all daily surveys, our results could be affected by this omission, especially if participants were less likely to complete the surveys on "bad" days when their status or inclusion were particularly low. Allaying this concern, however, follow-up analyses revealed that, with one exception, results were similar for participants who completed fewer days versus more days (see Footnote 1). In addition, multilevel modeling is generally robust to missing data (Snijders & Bosker, 2004).

Finally, some caution is warranted regarding the generalizability of the findings. Our sample comprised more women than men. The findings, however, were consistent for both women and men (see Supplementary Materials for details). Only one moderation effect emerged: The link between daily status and daily self-esteem was stronger for women. In addition, the sample did not permit examining results across various subgroups (e.g., students vs. nonstudents, different socioeconomic groups, and different ethnic groups), so the generalizability of the findings across these and other population subgroups remains an open question.

5 | CONCLUSIONS

Some individuals typically have higher status or are more included than others. At the same time, the same individual has higher status or is more included on some occasions than on others. Grounded in sociometer and hierometer theory, the current research examined how these within-person fluctuations in status and inclusion relate to self-regard (self-esteem and narcissism) and interpersonal behavior (assertiveness and affiliativeness) using a daily diary design. The results indicate that both status and inclusion fluctuate within-person from day to day, and relate to daily self-regard and interpersonal behavior in different ways. Specifically, self-esteem seems to operate as both hierometer and sociometer at the within-person level, tracking both status and inclusion and prompting both assertiveness and affiliativeness. In contrast, narcissism seems to operate chiefly as a hierometer at the within-person level, tracking status alone and prompting assertiveness alone. These patterns echo those obtained previously at the between-person level, with cross-sectional and experimental designs. In all, the findings highlight the promise of examining within-person fluctuations in both status and inclusion, and their association with psychological self-regard and interpersonal behavior, as a means of investigating the function of self-regard.

ETHICS

All study procedures involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all participants.

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CONFLICT OF INTEREST

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ENDNOTES

[1] Results were similar for participants who completed fewer days versus those who completed more days. We examined each of the hypothesized associations with number of days completed as a moderator. Only one significant moderation emerged: The link between daily inclusion and daily self-esteem was stronger for participants who completed fewer days, $\gamma = -0.10$, $SE = 0.05$, $t(2,241) = -2.04$, $p = .042$, 95% CI [−0.20, −0.004]. Thus, the results did not generally differ by the number of days completed.

[2] We calculated Cronbach's alphas separately for each daily survey. We report the average alpha (across the 10 daily surveys) along with the range.

[3] Denissen et al. (2008) conducted a cross-lagged analysis alongside their HLM analysis. Of their six theoretically relevant analyses—involving different aspects of social relationships that predicted state self-esteem—only one just reached significance at $p < .05$; the remaining five were marginal or nonsignificant. In view of these scant findings, they speculated that "the time lag that we analyzed in the current study (i.e., 1 day) was either too short or too long to adequately reflect the hypothesized sociometer processes (p. 178)." Similarly, Murray, Griffin, Rose, and Bellavia (2003, Table 4, p. 73) failed to find any next-day cross-lagged effects of acceptance and rejection by romantic partners on state self-esteem. Accordingly, we did not expect to find any next-day cross-lagged effects in our own data; and exploratory analyses duly confirmed our suspicion (see Supplementary Materials). However, cross-lagged effects consistent with sociometer theory have been obtained at longer time-intervals, such as 1 week (Srivastava & Beer, 2005), or 1 year (Reitz et al., 2016), pointing to the possibility of cumulative effects.

[4] Level 1 of this model deals with within-person differences. Y_{ij} refers to observed scores on day i of participant j. This observed score is estimated with a regression function where γ_{0j} is the intercept of that participant and γ_{10} represents the regression slope for the predictor variable, X_{ij}. The random-effect (error) term e_{ij} captures the deviation from the predicted score for a specific day and person, normally distributed with an average of 0 and variance σ^2. Level 2 of this model deals with between-person differences. Each person's regression intercept γ_{0j} is a function of the overall regression intercept γ_{00} plus a person's deviation from this overall intercept expressed in u_{0j}. This deviation, also called random-intercept, is normally distributed with a mean of 0 and variance of τ^2.

[5] Note that this result is also consistent with *self-broadcasting theory*, which posits that having higher self-esteem leads to being more included by others (Taylor, Lerner, Sherman, Sage, & McDowell, 2003). The current study, not being experimental in design, could not determine conclusively whether higher inclusion led to higher self-esteem, or whether higher self-esteem led to higher inclusion. However, past research using naturalistic longitudinal designs tends to support sociometer theory over self-broadcasting theory (Reitz et al., 2016; Srivastava & Beer, 2005). That is, higher inclusion by others covaried with higher self-esteem over time, whereas higher self-esteem did not covary with higher inclusion by others over time.

[6] Given that paths *a* and *b* were treated as fixed effects, there is no Level 2 covariance between these parameters. The simple *ab* product is sufficient to quantify the indirect effect (Hayes, 2013).

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the Supporting Information section.

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