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This version of the manuscript was accepted to *Journal of Personality and Social Psychology* on 2<sup>nd</sup> of July, 2019.

Low Self-Esteem Predicts Out-group Derogation via Collective Narcissism,  
but this Relationship Is Obscured by In-group Satisfaction

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Data, codes for analyses and a detailed description of procedures and measures can be found at <https://osf.io/47qt5/>

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#### Financial Disclosure/Funding

Work on this article was supported by National Science Centre grant 2017/26/A/HS6/00647 awarded to Agnieszka Golec de Zavala. Collection of data for Study 6 was supported by SWPS University of Social Sciences and Humanities, Warsaw grant WP/2017/A/24 awarded to Marzena Cypryńska and Agnieszka Golec de Zavala.

## Abstract

According to social identity theory, low self-esteem motivates group members to derogate out-groups, thus achieving positive in-group distinctiveness and boosting self-esteem. According to the Frankfurt School and status politics theorists, low self-esteem motivates collective narcissism (i.e., resentment for insufficient external recognition of the in-group's importance), which predicts out-group derogation. Empirical support for these propositions has been weak. We revisit them addressing whether (1) low self-esteem predicts out-group derogation via collective narcissism, and (2) this indirect relationship is only observed after partialling out the positive overlap between collective narcissism and in-group satisfaction (i.e., belief that the in-group is of high value and a reason to be proud). Results based on cross-sectional (Study 1,  $N = 427$ ) and longitudinal (Study 2,  $N = 853$ ) designs indicated that self-esteem is uniquely, negatively linked to collective narcissism and uniquely, positively linked to in-group satisfaction. Results based on cross-sectional (Study 3,  $N = 506$ ; Study 4,  $N = 1059$ ; Study 5,  $N = 471$ ), longitudinal (Study 6,  $N = 410$ ), and experimental (Study 7,  $N = 253$ ) designs corroborated these inferences. Further, they revealed that the positive overlap between collective narcissism and in-group satisfaction obscures the link between self-esteem and out-group derogation.

*Keywords:* self-esteem hypothesis, collective narcissism, in-group satisfaction, out-group derogation, symbolic aggression

*“Collective narcissism amounts to this: individuals compensate for the consciousness of their social impotence (...) by making themselves, either in reality or merely in their imaginations, into members of a higher, more comprehensive being. To this being they attribute the qualities they themselves lack, and from this being they receive in turn something like a vicarious participation in those qualities.”* (Theodor Adorno, 1997, p. 114)

*“Even if one is the most miserable, the poorest, the least respected member of a group, there is compensation for one's miserable condition in feeling "I am a part of the most wonderful group in the world. I, who in reality am a worm, become a giant through belonging to the group." Consequently, the degree of group narcissism is commensurate with the lack of real satisfaction in life.”* (Erich Fromm, 1973, p. 204)

*“(T)he need for positive self-esteem motivates social comparisons to differentiate oneself from others in terms of positively valued group characteristics and to differentiate one's own group from other groups”* (John Turner, 1982, p. 17)

Several theoretical accounts predict an association between low self-esteem (i.e., a belief that one is of low value; Kernis, 2005) and out-group derogation (i.e., “disdain and overt hostility towards out-groups;” Brewer, 1999, p. 442). According to social identity theory, out-group derogation is one of the ways available to group members for boosting their self-esteem (Rubin & Hewstone, 1998; Turner & Reynolds, 2001; Tajfel & Turner, 1979). According to Adorno (1963/1997), Fromm (1964/2010, 1973), and status politics theorists (Gusfield, 1963; Hofstadter, 1965; Lipset & Raab, 1973), out-group derogation is likely to occur in conditions that undermine self-esteem and increase narcissistic identification with the in-group (i.e., collective narcissism).

Collective narcissism is conceptualized here as a belief that the in-group is exceptional and entitled to privileged treatment, but it is not sufficiently recognized by others (Golec de Zavala, Cichocka, Eidelson, & Jayawickreme, 2009). In line with proposals from Adorno, Fromm and status politics theorists, studies have repeatedly linked collective narcissism to out-group derogation (for a review, see Golec de Zavala, Dyduch-Hazar, & Lantos, 2019). However, contrary to these proposals, studies have also suggested a null relationship between

self-esteem and collective narcissism (Golec de Zavala et al., 2009; Golec de Zavala, Peker, Guerra, & Baran, 2016). In addition, narrative reviews and a meta-analysis indicated that, on average, the relationship between self-esteem and out-group derogation is close to zero, thus contradicting predictions of social identity theory (Abrams & Hogg, 1988; Martiny & Rubin, 2016; Rubin & Hewstone, 1998; cf. Turner & Reynolds, 2001).

In this article, consistent with Adorno (1963/1997), Fromm (1964/2010, 1973), and status politics theorists (Gusfield, 1963; Hofstadter, 1965; Lipset & Raab, 1973), we argue that self-esteem is linked to out-group derogation indirectly, via collective narcissism. However, we go above and beyond these theorists' proposals by also arguing that this indirect relationship is obscured by the positive overlap between collective narcissism and in-group satisfaction (i.e., a belief that the in-group and one's membership in it are of a high value; Leach et al., 2008). Collective narcissism and in-group satisfaction are alternative beliefs that people may hold about the social identities they share<sup>1</sup>. Collective narcissism and in-group satisfaction are positively related (Golec de Zavala et al., 2019), but they may have opposite unique associations with self-esteem and out-group derogation. Consistent with this assertion, prior work has linked positive in-group identification (a variable akin to in-group satisfaction) with high self-esteem (Amiot & Aubin, 2013; Gramzow & Gaertner, 2005; Van Veelen, Otten, & Hansen, 2011), and reported a negative association between collective narcissism and personal control (Cichocka et al., 2018), with the latter, a correlate of self-esteem (Judge & Bono, 2001), being defined as a belief that one is able to influence the course of their own life (Deci & Ryan, 2000). In addition, after their positive overlap was partialled out, collective narcissism was positively and in-group satisfaction was negatively associated with out-group derogation (Golec de Zavala, Cichocka, & Bilewicz, 2013a). We posit, therefore, that the

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<sup>1</sup>Confirmatory and exploratory factor analyses conducted on items measuring collective narcissism and in-group satisfaction indicate a two factorial latent structure, consistent with the claim that collective narcissism and in-group satisfaction are distinguishable and correspond to different beliefs about the in-group (Dyduch-Hazar, Mrozinski, & Golec de Zavala, 2019; Golec de Zavala, 2019).

positive overlap between in-group satisfaction and collective narcissism may obscure (1) the opposite relationships those variables have with self-esteem, and (2) the indirect, negative link between self-esteem and out-group derogation via collective narcissism. When this overlap is partialled out, collective narcissism will be uniquely, negatively related to self-esteem, and will uniquely mediate the negative relationship between self-esteem and out-group derogation.

Our reasoning aligns with literature that distinguishes between two forms of positive in-group evaluation (i.e., ‘in-group love’), which are differentially linked to out-group derogation (i.e., ‘out-group hate;’ Brewer, 1999). These two forms have been given many labels (for a review, see Golec de Zavala & Schatz, 2013): genuine patriotism versus pseudo-patriotism (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950); patriotism versus nationalism (Blank & Schmidt, 2003; de Figueiredo & Elkins, 2003; Druckman, 1994; Kosterman & Feshbach, 1989); constructive patriotism versus blind patriotism (Schatz, Straub, & Lavine, 1999); in-group attachment versus in-group glorification (Roccas, Klar, & Liviatan, 2006); and secure versus insecure in-group attachment (Jackson & Smith, 1999). In this article, we label these forms in-group satisfaction versus collective narcissism. We also explain what in-group satisfaction and collective narcissism mean in their residual forms, that is, when their common variance is partialled out. Moreover, we link collective narcissism and in-group satisfaction to self-esteem. This practice allows us to clarify not only which normative belief about the in-group is related to out-group derogation, but also what motivates this relationship. Lastly, we propose an explanation for why prior research has obtained null relationships between self-esteem and collective narcissism, and between self-esteem and out-group derogation.

### **Self-Esteem and Out-Group Derogation**

According to social identity theory, to the extent that people evaluate themselves in terms of their group membership, they may derive positive self-evaluation from positive in-group distinctiveness. Thus, they may compare their in-group with salient out-groups on relevant comparison dimensions to achieve positive in-group evaluation and boost their self-esteem (Tajfel & Turner, 1979; Turner & Reynolds, 2001). Indeed, empirical evidence

supports the expectation that out-group derogation increases both positive evaluation of the in-group and personal self-esteem (Fein & Spencer, 1997; for a review, see Rubin & Hewstone, 1998; cf. Abrams & Hogg, 1988). However, the expectation that low self-esteem motivates out-group derogation (corollary two of the self-esteem hypothesis; Abrams & Hogg, 1988) has not been empirically supported (Brown, 2000; Rubin & Hewstone, 1998). Results have linked both low and high self-esteem to out-group derogation or showed no relationship between these variables (Aberson, Healy, & Romero, 2000; Ellemers, Spears, & Doosje, 2002). Moreover, the overall relationship between positive in-group evaluation and out-group derogation was found to be close to zero (Brewer, 1979; Hinkle & Brown, 1990; Jackson, Brown, Brown, & Marks, 2001; Pehrson, Brown, & Zagefka, 2009).

It is possible that the self-esteem hypothesis over-implicates self-esteem in intergroup behavior (Abrams & Hogg, 1988; Turner & Reynolds, 2001), and so corollary two of the self-esteem hypothesis may be valid in a more circumscribed formulation (Martiny & Rubin, 2016; Rubin & Hewstone, 1998). Along these lines, we maintain that corollary two may be valid when low self-esteem is compensated by a collective-narcissist belief in the in-group's entitled but unrecognized greatness. Thus, low self-esteem will predict out-group derogation indirectly, via collective narcissism. Indeed, there are reasons to expect that the relationship between collective narcissism and self-esteem is negative. Yet, there are also reasons to expect that in-group satisfaction, which overlaps positively with collective narcissism, is positively associated with self-esteem. Hence, collective narcissism and in-group satisfaction may have opposite associations with self-esteem, which will be observed when their common variance is partialled out.

### **Collective Narcissism, In-Group Satisfaction, and Self-Esteem**

The key to understanding why collective narcissism and in-group satisfaction have distinct associations with out-group derogation may be that they are related to distinct personal motivations for engaging with the in-group. For instance, when the positive overlap between collective narcissism and in-group satisfaction is partialled out, in-group satisfaction is positively associated with personal control, but collective narcissism is negatively associated with it (Cichocka et al., 2018). Such findings suggest that collective narcissists

may exaggerate their in-group's importance as they attempt to compensate for their self-esteem deficits, given that—as we stated previously—personal control overlaps with self-esteem (Judge & Bono, 2001).

Adorno (1997) and Fromm (1964/2010, 1973) did imply that collective narcissism compensates for undermined self-esteem. Relatedly, a literature review (Golec de Zavala et al., 2019) concluded that collective narcissism is associated with vulnerable narcissism (i.e., a neurotic and frustrated expression of individual narcissism; Miller et al., 2011). The review also concluded that the association of collective narcissism with grandiose narcissism (i.e., the agentic and dominant expression of individual narcissism; Thomaes, Brummelman, & Sedikides, 2018) was far smaller and more heterogeneous. Importantly, vulnerable narcissism covaries with self-esteem negatively, whereas grandiose narcissism covaries with self-esteem positively (Miller, Lynam, Hyatt, & Campbell, 2017), suggesting that collective narcissism may covary with self-esteem negatively. Relatedly, research has linked collective narcissism to self-criticism, low life-satisfaction, negative emotionality, and exaggerated sensitivity to negative environmental stimuli. These relationships became transparent when the positive overlap between collective narcissism and in-group satisfaction was partialled out (Golec de Zavala, 2019). Together, this body of evidence suggests that collective narcissism is negatively associated with self-esteem, but the overlap with in-group satisfaction obscures this association.

Further, in-group satisfaction is uniquely associated with positive emotionality, prosociality, and life satisfaction (Golec de Zavala, 2019). Positive social identification, akin to the variable we label in-group satisfaction, has also been linked to better mental health and lower probability of depression, whose crucial symptom is diminished self-esteem (Jetten, Haslam, Haslam, Dingle, & Jones, 2014). Also, the proposition that in-group satisfaction is positively related to self-esteem aligns with literature suggesting that high self-esteem individuals project their positive self-views onto their in-groups (Amiot & Aubin, 2013; Gramzow & Gaertner, 2005; Van Veelen, Otten, & Hansen, 2011). Similarly, high self-esteem has been linked to the belief that individuals should use their strengths and positive characteristics to enhance their in-groups (Amiot & Sansfaçon, 2011; Jans, Postmes, & Van



der Zee, 2012; Legault & Amiot, 2014), suggesting that, unlike collective narcissism, in-group satisfaction is positively associated with self-esteem.

In summary, individuals whose self-esteem is undermined may become inclined towards collective-narcissist beliefs about the in-group. They may demand privileged treatment and recognition of their in-group to compensate for their personal shortcomings. Demanding special treatment for the in-group, they do not shy away from derogating out-groups. In contrast, individuals with high self-esteem may enhance their in-group and also be prone to understanding and tolerating others, who happen to act accordingly for their own in-groups. Detecting those relationships may be impossible without partialling out the positive overlap between collective narcissism and in-group satisfaction, as this overlap is likely to suppress the opposite relationships those variables have with self-esteem and out-group derogation. Hence, it is crucial to explicate what collective narcissism and in-group satisfaction mean in their residual forms.

### **Collective Narcissism, In-group Satisfaction, and Their Residual Forms**

Collective narcissism and in-group satisfaction have in common the belief that the in-group is of high value. It is what they do not have in common, however, that appears to drive their opposite relationships with out-group derogation. When the positive overlap between collective narcissism and in-group satisfaction is partialled out, in-group satisfaction predicts out-group tolerance (Golec de Zavala et al., 2013a, 2016). Unlike collective narcissism, in-group satisfaction is unrelated to hypersensitivity to threat to the in-group's image (Golec de Zavala et al., 2016) or beliefs about the out-group's hostile intentions towards the in-group (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016; Dyduch-Hazar, Mrozinski, & Golec de Zavala, 2018; Golec de Zavala & Cichocka, 2012).

We propose to interpret residual forms of collective narcissism and in-group satisfaction analogously to residual forms of self-esteem and individual narcissism when their positive overlap is partialled out (Golec de Zavala, 2011; Golec de Zavala et al., 2013a). Personal self-esteem, a belief that one is of a high value and the pride one takes in their own strengths (Brummelman, Thomaes, & Sedikides, 2016; Kernis, 2005; Sedikides & Gregg, 2003), and individual narcissism, an inflated view of oneself that requires continual external

validation (Emmons, 1987; Morf & Rhodewalt, 2001; Sedikides & Campbell, 2017) are associated distinctly with interpersonal aggressiveness. When their common variance is accounted for, self-esteem predicts less, whereas individual narcissism predicts more, self-reported interpersonal anger, aggressiveness, and anti-social behaviors (Barry, Grafeman, Adler, & Pickard, 2007; Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Locke, 2009; Paulhus, Robins, Trzesniewski, & Tracy, 2004). Self-esteem with individual narcissism partialled out is interpreted as balanced and stable self-positivity, independent of external influences. Individual narcissism with self-esteem partialled out is interpreted as exaggerated self-entitlement requiring incessant external validation (Brummelman, Gürel, Thomaes, & Sedikides, 2018).

Likewise, collective narcissism with in-group satisfaction partialled out may be interpreted as group-based entitlement without the comfort of the sense of belonging to a valuable in-group. What remains in collective narcissism, when in-group satisfaction is partialled out, is the demand for privileged treatment and the concern about loss of the in-group's external recognition. In-group satisfaction with collective narcissism partialled out may be interpreted as a positive evaluation of the in-group, independent of external recognition and resilient to threats or criticism (Golec de Zavala, 2011, 2018; Golec de Zavala et al., 2019).

## **Overview**

We test two hypotheses. According to Hypothesis 1, self-esteem has opposite, unique relationships with collective narcissism and in-group satisfaction, which are discernible when the positive overlap between collective narcissism and in-group satisfaction is partialled out. Specifically, after this overlap is partialled out, the relationship between self-esteem and collective narcissism will be negative, whereas the relationship between self-esteem and in-group satisfaction will be positive. According to Hypothesis 2, low self-esteem is uniquely associated with out-group derogation via collective narcissism, but this indirect relationship is discernible after the positive overlap between collective narcissism and in-group satisfaction is partialled out.

In cross-sectional Study 1, we provided an initial test of Hypothesis 1 by re-analyzing existing data (Golec de Zavala et al., 2016, Study 4). We obtained effect sizes for the unique links among self-esteem, collective narcissism, and in-group satisfaction. In Study 2, we examined the assumed directionality of the link between self-esteem and collective narcissism versus in-group satisfaction in a longitudinal, cross-lagged design with two measurement waves.

In Study 3, we tested Hypotheses 1-2. We also put to test the notion that it is self-esteem, rather than personal control, that predicts collective narcissism versus in-group satisfaction (Cichocka et al., 2018). We expected that personal control would link to collective narcissism versus in-group satisfaction by virtue of being associated with self-esteem. In Study 4, we tested Hypotheses 1-2 in a representative national sample and with a different target out-group than in Study 3. In Study 5, we re-tested Hypotheses 1-2 to find out whether the anticipated relationships generalize to a different national and intergroup context, and beyond out-group derogation to its behavioral consequences (i.e., symbolic intergroup aggression; DeWall et al., 2013). Next, to overcome the causal-identification problems inherent in cross-sectional tests of mediation, we re-examined Hypothesis 2, in Study 6, using a cross-lagged, longitudinal design with four measurement waves. Finally, in Study 7, to strengthen our claims about the motivational role of low self-esteem in inspiring out-group derogation, we tested Hypotheses 1-2 in an experimental design manipulating state self-esteem via intergroup exclusion. We expected that (only) self-esteem undermined by exclusion would predict symbolic aggression towards the excluding out-group (Fein & Spencer, 1997; Martiny & Rubin, 2016; Rubin & Hewstone, 1998). In particular, we focused on whether experimentally lowered (vs. heightened) state self-esteem leads to symbolic aggression uniquely by increasing collective narcissism.

In Studies 1-4 and Study 6, we used Polish samples. Collective narcissistic rhetoric about Poland's misunderstood greatness has been increasingly present in public life, especially since the right-wing populist party *Prawo i Sprawiedliwość* (*Law and Justice*) came to power (Hedges, 2017). In the wake increasing xenophobic attitudes and behaviors (Wasik & Foy, 2016), we zeroed in on the links between collective narcissism and two forms

of out-group derogation prevalent in Poland: (1) prejudice towards Jews (Study 3), which has been historically present in Poland and remains so despite Polish Jews representing a strikingly small percentage of the Polish population (Kroet, 2017; *The Guardian*, February 10, 2018); and (2) prejudice towards Syrian refugees (Study 4), a threatening new out-group in Poland since the 2015 refugee crisis (Hall & Mikulska-Jolles, 2016).

For Studies 5 and 7, we relied on U.S. samples. In the current government administration, collective narcissistic rhetoric has also become more prevalent in American public life. For instance, collective narcissism was among the strongest predictors of voting for Donald Trump in the 2016 presidential election (Federico & Golec de Zavala, 2017), and collective narcissism was linked to amplified conspiracy thinking during his campaign (Golec de Zavala & Federico, 2018). In Study 5, we focused on symbolic aggression of White Americans towards the Muslim minority. In 2016-2017, hostility towards Muslims increased in the U.S. and surpassed the highest levels reported in 2001 after the 9/11 attacks (Pew Research Center Forum, July, 26, 2017). In Study 7, we tested whether experimentally lowered state self-esteem (i.e., self-appraisal at a current moment; Rubin & Hewstone, 1998) raises collective narcissism culminating in symbolic intergroup aggression.

In all, we employ a combination of cross-sectional, longitudinal, and experimental designs with varied out-group targets, and we also implicate two national contexts, to test our hypotheses and their generalizability. Finally, we examine whether the relationships among the constructs of interest are similar for out-group derogation and its behavioral consequence, intergroup aggression.

Studies 1-5 and Study 7 were reviewed and accepted by the Research Ethics Committee at Goldsmiths, University of London, Department of Psychology: "Counteracting collective narcissistic hypersensitivity by stimulating emotional resilience". Study 6 was reviewed and accepted by the Research Ethics Committee (Komisja Etyki Badań) at University of Social Science and Humanities in Warsaw, Poland: "Collective narcissism and reactions to social exclusion: the role of mindfulness practice".

## STUDY 1

In Study 1, we carried out an initial test of Hypothesis 1 on a sample of Polish participants from a published study that examined a different hypothesis concerning the relationships among collective narcissism, hypersensitivity to in-group offence, and intergroup hostility (Golec de Zavala et al., 2016, Study 4). This study assessed in-group satisfaction and self-esteem as covariates, offering the opportunity not only to test Hypothesis 1, but also to obtain effect sizes for future sample size estimation.

We first analyzed partial correlations of self-esteem with collective narcissism and in-group satisfaction. Next, we tested the suppression effect of in-group satisfaction on the link between self-esteem and collective narcissism. Suppression occurs when one variable increases the predictive validity of another variable, and when a direct and indirect (via the suppressor) relationships between two variables have opposite signs (MacKinnon, Krull, & Lockwood, 2000). As per Hypothesis 1, we expected that in-group satisfaction would suppress the negative association between self-esteem and collective narcissism.

## **Method**

### **Participants and Procedure**

Participants were 427 Polish nationals (220 women, 207 men) ranging in age from 18-80 years ( $M = 43.67$ ;  $SD = 15.30$ ). Data collection was carried out via the Ariadna Research Panel (<http://www.panelariadna.com>). The sample size was initially set to be over 250 (Schönbrodt & Perugini, 2013). We calculated whether this sample size would be adequate to test Hypothesis 1. We used Monte Carlo Power Analysis for Indirect Effects app developed by Schoemann, Boulton, and Short (2017; [http://marlab.org/power\\_mediation](http://marlab.org/power_mediation)) and the Power and N computation app developed by Fritz and MacKinnon (2007; <https://davidakenny.shinyapps.io/MedPower/>). We entered the smallest effect sizes obtained by previous research (Golec de Zavala et al., 2019) for the links between collective narcissism and in-group satisfaction,  $r = .24$ , in-group satisfaction and self-esteem,  $r = .38$  (Amiot & Aubin, 2013), and collective narcissism and self-esteem,  $r = .007$  (Golec de Zavala et al., 2016). We conservatively assumed a small effect size for the indirect link between self-esteem and collective narcissism,  $r = .10$ . The estimation of a sample size adequate to test relationships of such sizes with power of .80 pointed to a sample size of  $N = 150$ . We

concluded that our sample size in Study 1 was adequate to test Hypothesis 1. Participants responded to an online survey allegedly pertaining to the relationship between personality and perception of celebrities.

### Measures

Participants completed all measures on a scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). Here, and in Studies 2-4 and 6, the measures were presented in a separate random order for each participant. Differences in degrees of freedom in all studies are due to missing data.

**Self-esteem** was assessed with a 10-item Polish version of the Rosenberg Self-Esteem Scale (Dzwonkowska, Lachowicz-Tabaczek, & Laguna, 2008; e.g., “I take a positive attitude toward myself“):  $\alpha = .89$ ,  $M = 4.90$ ,  $SD = 1.05$ .

**Collective narcissism** was assessed with a 5-item Collective Narcissism Scale (Golec de Zavala et al., 2009; e.g., “My group deserves special treatment“):  $\alpha = .90$ ,  $M = 4.12$ ,  $SD = 1.31$ .

**In-group satisfaction** was assessed with the 4-item in-group satisfaction subscale of the Polish version of the In-group Identity Scale (Jaworska, 2016; Leach et al., 2008). In-group satisfaction refers to positive evaluation of the in-group. As such, it is a most relevant comparison to collective narcissism, which also refers to positive in-group evaluation but in a substantially different manner<sup>2</sup>. The items were: “I am glad to be Polish,” “I think that Poles

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<sup>2</sup>Collective narcissism is associated with the self-investment dimension (in-group satisfaction and in-group centrality), but not with the self-definition dimension of social identity (Jaworska, 2016). Positive evaluation of the in-group is central to the self-concept of individuals who endorse the collective-narcissistic belief. Thus, differentiating between in-group satisfaction and collective narcissism can deepen understanding of the interplay between evaluation of the in-group and evaluation of the self. (For a more comprehensive discussion of why in-group satisfaction is a most crucial comparison to collective narcissism, see Golec de Zavala, Dyduch-Hazar, & Lantos, 2019).

have a lot to be proud of,” “It is pleasant to be Polish,” and “Being Polish gives me a good feeling” ( $\alpha = .93$ ,  $M = 4.97$ ,  $SD = 1.30$ ).

### Results and Discussion

Collective narcissism and in-group satisfaction were positively correlated. Self-esteem was positively correlated with in-group satisfaction. After the positive overlap between collective narcissism and in-group satisfaction was partialled out, the correlation between self-esteem and in-group satisfaction remained significant and positive. As expected, the partial correlation between self-esteem and collective narcissism became significant and negative (Table 1).

We analyzed the suppression effect of in-group satisfaction on the negative link between self-esteem and collective narcissism using PROCESS macro for SPSS (Model 4, Hayes, 2017). We requested 10,000 bootstrap samples and 95% bias-corrected bootstrap confidence intervals. The whole model with self-esteem as the predictor, in-group satisfaction as the suppressor, and collective narcissism as the outcome was significant,  $F(2, 424) = 69.26$ ,  $p < .001$ ,  $R^2 = .25$ . The hypothesized indirect effect was significant. The direct and indirect effects had opposite signs, which suggests that in-group satisfaction suppressed the negative association between self-esteem and collective narcissism. We also analyzed the suppression effect of collective narcissism on the link between self-esteem and in-group satisfaction. The whole model was significant,  $F(2, 424) = 95.50$ ,  $p < .001$ ,  $R^2 = .31$ , but the indirect effect was not significant (Table 1).

These results are consistent with Hypothesis 1. They indicate that, when their positive overlap is partialled out, in-group satisfaction and collective narcissism have opposite unique relationships with self-esteem. Self-esteem is uniquely, negatively associated with collective narcissism and is uniquely, positively associated with in-group satisfaction. In addition, in-group satisfaction suppressed the negative association between collective narcissism and self-esteem, explaining why previous studies did not find a direct link between the two variables. The suppression was not mutual. The relationship between self-esteem and in-group satisfaction was positive whether collective narcissism was partialled out or not. This corroborates previous findings of a positive correlation between self-esteem and in-group

satisfaction (Amiot & Aubin, 2013; Amiot & Sansfaçon, 2011). In the next study, we tested the replicability of these results and sought stronger evidence for the directionality of the relationships, as per Hypothesis 1.

## STUDY 2

In Study 2, we tested Hypothesis 1 in a longitudinal design. We measured self-esteem, collective narcissism, and in-group satisfaction in two waves, eight weeks apart. This design allowed us to draw stronger conclusions about directional and opposite influences of self-esteem on collective narcissism and in-group satisfaction (correcting for possible feedback effects of collective narcissism and in-group satisfaction on self-esteem; Cole & Maxwell, 2003; Little, Preacher, Selig, & Card, 2007; Schoemann et al., 2017). In statistical terms, we used a cross-lagged panel model to examine whether Time 1 (T1) self-esteem predicts Time 2 (T2) collective narcissism with Time 1 in-group satisfaction controlled for, and whether Time 1 self-esteem predicts Time 2 in-group satisfaction (with an opposite sign) with Time 1 collective narcissism controlled for.

## Method

### Participants and Procedure

We relied on a nationally representative sample of Polish adults (via the Ariadna Research Panel) to collect the first wave of measurement, which occurred five years after gathering Study 1's data. The first data collection wave recruited 1065 participants (554 women, 511 men) ranging in age from 18-76 years ( $M = 43.74$ ,  $SD = 15.33$ ). The second data collection wave occurred eight weeks later recruiting 853 participants from the previous wave (427 men, 426 women) aged between 18 and 76 years ( $M = 44.49$ ,  $SD = 15.19$ ). Data collection for the second wave ceased on a predetermined date. Analyses relied on the 853 participants who completed both waves.

### Measures

**Self-esteem** (Dzwonkowska et al., 2008) was assessed as in Study 1. The response options ranged from 1 (*completely disagree*) to 7 (*completely agree*): T1:  $\alpha = .87$ ,  $M = 4.92$ ,  $SD = 1.04$ ; T2:  $\alpha = .85$ ,  $M = 4.71$ ,  $SD = 0.94$ .



**Collective narcissism** (Golec de Zavala et al., 2009) was assessed as in Study 1. The response options ranged from 1 (*totally disagree*) to 6 (*totally agree*): T1:  $\alpha = .91$ ,  $M = 3.64$ ,  $SD = 1.22$ ; T2:  $\alpha = .93$ ,  $M = 3.44$ ,  $SD = 1.23$ .

**In-group satisfaction** (Jaworska, 2016) was assessed as in Study 1. The response options ranged from 1 (*totally disagree*) to 6 (*totally agree*): T1:  $\alpha = .96$ ,  $M = 4.51$ ,  $SD = 1.21$ ; T2:  $\alpha = .96$ ,  $M = 4.43$ ,  $SD = 1.19$ .

## Results and Discussion

### Data Preparation

In Study 1, we tested the relationship between self-esteem and residual collective narcissism versus in-group satisfaction using partial correlations and cross-sectional mediation models. To accomplish the equivalent in Study 2, we generated residualized measures of collective narcissism and in-group satisfaction. We regressed the raw measure of collective narcissism from each wave on the in-group satisfaction measure from the same wave, and we derived the residual to generate the measure of residual collective narcissism. We used a similar approach to generate the measure of residual in-group satisfaction. We regressed in-group satisfaction on collective narcissism from the same wave and derived the residual. To place measures on comparable and more easily-interpretable scales, we recoded all residual measures to run from 0 to 1 (T1 residual collective narcissism:  $M = 0.49$ ,  $SD = 0.15$ ; T2 residual collective narcissism:  $M = 0.50$ ,  $SD = 0.17$ ; T1 residual in-group satisfaction:  $M = 0.58$ ,  $SD = 0.15$ ; T2 residual in-group satisfaction:  $M = 0.60$ ,  $SD = 0.15$ ). Though self-esteem was not residualized, we also recoded it to run from 0 to 1 in both time periods for comparability (T1 self-esteem:  $M = 0.65$ ,  $SD = 0.17$ ; T2 self-esteem:  $M = 0.62$ ,  $SD = 0.16$ ). With this 0-1 recoding, the unstandardized coefficients represent change in each outcome as a proportion of its full range from the lowest to the highest value of a given predictor (Achen, 1982)<sup>3</sup>.

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<sup>3</sup>To examine whether participant attrition was linked to study variables differently across waves, we compared T1 participants who completed both waves with those who did not do so on all T1 variables. Participants did not differ on self-esteem,  $diff = 0.016$ ,  $t(1063) = 1.23$ ,  $p =$

## Data Analysis

To test Hypothesis 1 in a longitudinal context, we estimated a cross-lagged panel using the T1 and T2 residualized measures of collective narcissism and in-group satisfaction, and a measure of self-esteem (Finkel, 1995). By controlling for lagged values of the dependent variable, this approach provides estimates of the hypothesized independent variable that corrects for feedback effects and provides greater leverage in drawing inferences about causal order. We used path analysis with observed variables to estimate this model in Stata 14 (StataCorp, 2015). We regressed the T2 measure of each of the three variables on the T1 measure of all three variables. Put otherwise, in each analysis, we regressed a T2 variable on its own lagged value from T1, as well as the T1 values of the other variables. We allowed the disturbance terms for the T2 measures of the three variables to inter-correlate, and so did we for the T1 exogenous measures of all three variables. We illustrated the model in Figure 1. Given that the model is saturated (with zero degrees of freedom), we do not report standard global fit indices used in structural-equation modeling. In any case, our primary interest is less in overall fit than in examining the direct-effect estimates pertinent to Hypothesis 1.

Table 2 reports the zero-order correlations among the input variables, and Table 3 reports the key estimates from the cross-lagged panel model. The standardized estimates for the regression of T2 residual collective narcissism, and for T2 residual in-group satisfaction on the T1 variables, reflect the predicted relationships involving self-esteem. Net of T1 residual collective narcissism and in-group satisfaction, self-esteem at T1 was *negatively* associated with residual collective narcissism at T2 ( $\beta = -.10, p < .001$ ). Net of T1 residual collective narcissism and in-group satisfaction, self-esteem at T1 was *positively* associated with residual in-group satisfaction at T2 ( $\beta = .10, p < .001$ ).

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.22,  $d = 0.09$ , or residualized in-group satisfaction,  $diff = 0.005, t(1063) = 1.61, p = .25, d = 0.035$ . They only differ marginally on residualized collective narcissism,  $diff = 0.021, t(1063) = -1.89, p = .059, d = 0.14$ . Panel-attrition differences appear to be minimal with respect to our key study variables.

These estimates indicate that self-esteem influences collective narcissism and in-group satisfaction in a way that is robust to corrections for reverse causal effects. The results are consistent with Hypothesis 1<sup>4</sup>. Importantly, the hypothesized signs of the relationship between self-esteem and collective narcissism versus in-group satisfaction are empirically supported. In subsequent studies, we proceeded to test Hypothesis 2. In each study, we also conducted analyses to inspect the replicability of Study 1-2 findings.

### STUDY 3

In Study 3, we tested Hypothesis 1-2. We tested Hypothesis 1 as in Study 1. To test Hypothesis 2, in line with accustomed practice (Cichocka et al., 2018; Golec de Zavala et al., 2013a), we conducted a mediation analysis entering in-group satisfaction as a covariate. Additionally, we examined whether in-group satisfaction linked high self-esteem to out-group tolerance. Thus, we carried out a mediation analysis entering in-group satisfaction as a mediator of the relationship between self-esteem and out-group derogation with collective narcissism as a covariate.

Furthermore, we examined whether the hypothesized relationships are specific to self-esteem after the positive overlap between self-esteem and personal control is accounted for. To this effect, we tested Hypotheses 1-2 adding personal control as a second covariate. Also, we conducted the same analyses with personal control as a predictor and self-esteem as a covariate. Prior work suggested that, after their positive overlap is partialled out, the relationship of collective narcissism with personal control is negative, whereas the relationship of in-group satisfaction with personal control is positive (Cichocka et al., 2018).

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<sup>4</sup>When we examined the reverse pathways for the regression of T2 self-esteem on the T1 variables, we obtained weaker effects. Additionally, the reverse direction from collective narcissism to self-esteem was not significant. Net of T1 self-esteem, T1 residual collective narcissism ( $\beta = -.01, p > .250$ ) was unrelated to T2 self-esteem, whereas T1 residual in-group satisfaction predicted greater T2 self-esteem ( $\beta = .06, p = .05$ ). Hence, the results indicate that self-esteem and in-group satisfaction influence one another. However, although low self-esteem influences collective narcissism, collective narcissism does not influence self-esteem.

However, this work did not examine whether those opposite relationships are unique to personal control or due to its positive overlap with self-esteem. We sought to disambiguate the role of personal control and self-esteem in predicting collective narcissism and, indirectly, out-group derogation.

We tested Hypothesis 2 using social distance from an out-group, Jews, as a measure of out-group derogation. Prejudice towards Jews is one of the most prevalent forms of prejudice in contemporary Poland (Kroet, 2017; *The Guardian*, February 10, 2018; Winiewski & Bilewicz, 2015). This prejudice is associated with Polish collective narcissism (Golec de Zavala & Cichocka, 2012).

## Method

### Participants and Procedure

The data were collected by the Ariadna Research Panel. The sample consisted of 506 Polish adults (273 women, 233 men), ranging in age from 18 to 76 years ( $M = 43.15$ ,  $SD = 15.37$ ). This sample size was adequate to test Hypothesis 1, as indicated by the power estimation in conjunction with Study 1. We estimated the sample size necessary to test Hypothesis 2 using the same method as in Study 1. We entered  $r = .16$  for the relationship between self-esteem and collective narcissism (based on Study 1),  $r = .20$  for the relationship between collective narcissism and out-group hostility (based on the meta-analytic summary in Golec de Zavala et al., 2019), and  $r = .23$  for the relationship between self-esteem and out-group hostility (Golec de Zavala et al., 2016). The necessary sample size to test the hypothesized indirect effect was  $N = 421$ . We conservatively oversampled and ceased data collection on a predetermined date. Participants completed an online survey allegedly concerning self-perceptions and perceptions of Poland.

### Measures

All response options ranged from 1 (*totally disagree*) to 6 (*totally agree*). **Self-esteem** (Dzwonkowska et al., 2008;  $\alpha = .90$ ,  $M = 4.20$ ,  $SD = 0.90$ ), **collective narcissism** (Golec de Zavala et al., 2009;  $\alpha = .89$ ,  $M = 3.65$ ,  $SD = 1.13$ ), and **in-group satisfaction** (Jaworska, 2016;  $\alpha = .93$ ,  $M = 4.36$ ,  $SD = 1.15$ ) were assessed as in Studies 1-2.

**Personal control** was assessed with five items implicated in prior research conducted in Poland (Cichočka et al., 2018). The items were: “Frankly speaking, whatever happens I will be able to take care of it,” “I feel I have control over my life,” “I do not have influence on my fate (reversely coded),” “There are few things in my life I cannot influence (reversely coded),” and “Things in my life are not happening by chance” ( $\alpha = .64$ ,  $M = 4.14$ ,  $SD = .76$ ).

**Out-group derogation** was assessed using a 3-item social distance scale (Bogardus, 1925). The items were: “I would accept a Jewish person working with me,” “I would accept a Jewish person being my neighbor,” and “I would accept a Jewish person marrying a member of my family” ( $\alpha = .95$ ,  $M = 2.82$ ,  $SD = 1.55$ ). We recorded them, so that higher scores reflected more out-group derogation.

### Results and Discussion

Zero-order correlations indicated that collective narcissism was positively related to in-group satisfaction and out-group derogation (marginally). In-group satisfaction was positively correlated with self-esteem. In-group satisfaction, self-esteem, and personal control correlated negatively with out-group derogation (Table 4). After the positive overlap between collective narcissism and in-group satisfaction was partialled out, the partial correlation between self-esteem and collective narcissism became negative and significant, whereas the partial correlation between self-esteem and in-group satisfaction remained significant and positive, replicating the Study 1 results (Table 1).

The whole model for the suppression analysis testing Hypothesis 1, with collective narcissism as the outcome, self-esteem as the predictor, and in-group satisfaction as the suppressor, was significant,  $F(2, 503) = 152.66$ ,  $p < .001$ ,  $R^2 = .38$ . The hypothesized indirect effect was positive and significant, suggesting suppression. The whole model for the analyses with in-group satisfaction as the outcome, self-esteem as the predictor, and collective narcissism as the suppressor, was significant,  $F(2, 503) = 185.42$ ,  $p < .001$ ,  $R^2 = .42$ , whereas the indirect effect was not significant, replicating the Study 1 results (Table 1).

To test Hypothesis 2, we entered self-esteem as the predictor, collective narcissism as the mediator, out-group derogation as the outcome, and in-group satisfaction as the covariate (PROCESS macro for SPSS, Model 4; Hayes, 2017). We requested 10,000 bootstrap samples

and 95% bias-corrected bootstrap confidence intervals. The whole model was significant,  $R^2 = .05$ ,  $F(3, 502) = 7.87$ ,  $p < .001$ . The hypothesized indirect effect of self-esteem on out-group derogation via collective narcissism was also significant. Next, we conducted a mediation analysis, in which we entered self-esteem as the predictor, in-group satisfaction as the mediator, out-group derogation as the outcome, and collective narcissism as the covariate. The indirect effect of self-esteem via in-group satisfaction on out-group derogation was significant (Table 1). Additionally, the negative direct effect of self-esteem on out-group derogation was significant,  $b = -.17$ ,  $SE = .08$ ,  $p = .04$ .

Subsequently, we examined whether the results supporting Hypotheses 1-2 were specific to self-esteem independent of its overlap with personal control and whether personal control had any unique (after its covariance with self-esteem was accounted for) contribution to explaining variance in collective narcissism versus in-group satisfaction and out-group derogation. First, we conducted analyses to test Hypotheses 1-2 entering personal control as an additional covariate. The results supporting Hypotheses 1-2 remained significant. Next, we tested Hypothesis 1 with personal control as the predictor and self-esteem as the covariate. We did not replicate previous findings linking personal control to collective narcissism negatively and in-group satisfaction positively (Cichocka et al., 2018). This suggests that personal control is not uniquely associated with beliefs about the in-group after its positive overlap with self-esteem is accounted for. The analyses testing Hypothesis 2 with personal control as the predictor and self-esteem as the covariate also did not yield any significant relationships between personal control and out-group derogation (for detailed analyses, see Supplementary Materials.)

The results of Study 3 support Hypothesis 1, replicating the findings of Studies 1-2. The results also support Hypothesis 2. When the positive overlap between in-group satisfaction and collective narcissism is partialled out, low self-esteem is associated with out-group derogation via collective narcissism. In addition, high self-esteem predicts out-group tolerance uniquely via in-group satisfaction. Also, the results suggest that deficits in self-esteem, rather than the need to restore personal control, underlie collective narcissism and, indirectly, out-group derogation. Thus, the results clarify prior work that did not control for

the overlap between self-esteem and personal control (Cichocka et al., 2018). In the following study, we examined whether the findings generalized to another intergroup context.

#### STUDY 4

In Study 4, we sought to replicate the Study 3 results using a different target of out-group derogation in a national representative sample. In particular, we assessed social distance from a novel and threatening out-group in Poland, namely, Syrian refugees. Syrian refugees are perceived as threatening and culturally dissimilar, and violence towards them is accepted as a way of managing the refugee crisis (Hall & Mikulska-Jolles, 2016; Świdarska, Winiewski, & Hansen, 2016).

#### Method

##### Participants and Procedure

Data for Study 4 were collected by the Ariadna Research Panel as a part of a weekly opinion poll. Study 4 was conducted more than two years after Studies 1 and 3. The sample consisted of 1059 Polish adults (556 women, 503 men), ranging in age from 18 to 76 years ( $M = 43.78$ ,  $SD = 15.00$ ). The online sample was selected to match the population on a range of characteristics. Based on sample size calculations pertinent to Study 3, we deemed this sample size adequate to test the expected indirect effects.

##### Measures

All response options ranged from 1 (*totally disagree*) to 6 (*totally agree*). **Self-esteem** (Dzwonkowska et al., 2008;  $\alpha = .87$ ,  $M = 4.12$ ,  $SD = 0.80$ ), **collective narcissism** (Golec de Zavala et al., 2009;  $\alpha = .92$ ,  $M = 3.46$ ,  $SD = 1.07$ ), and **in-group satisfaction** (Jaworska, 2016;  $\alpha = .93$ ,  $M = 4.28$ ,  $SD = 1.03$ ) were assessed the same way as in Studies 1-3.

**Out-group derogation** was assessed similar to Study 3 as social distance, using the following two items: “I would have nothing against someone from my family marrying a Syrian refugee” and “I would have nothing against a Syrian refugee family moving into the neighboring apartment/house” ( $\alpha = .83$ ,  $M = 3.62$ ,  $SD = 1.24$ )<sup>5</sup>. We constructed these items for

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<sup>5</sup>The survey contained two additional items pertaining to attitudes towards Syrian refugees: “I have positive feelings towards Syrian refugees” and “I fully trust Syrian refugees.” We report

the purposes of our research and reverse-scored them, so that higher values signified greater out-group derogation.

### Results and Discussion

Zero-order correlations indicated that collective narcissism was positively related to in-group satisfaction and to out-group derogation. In-group satisfaction was positively correlated with self-esteem (Table 5). After the positive overlap between collective narcissism and in-group satisfaction was partialled out, the partial correlation between self-esteem and collective narcissism was negative and significant, whereas the partial correlation between self-esteem and in-group satisfaction remained positive and significant. The whole model for the suppression analysis with collective narcissism as the outcome, self-esteem as the predictor, and in-group satisfaction as the suppressor (PROCESS, Model 4; Hayes, 2017; 10,000 bootstrap samples and 95% bias-corrected bootstrap CI) was significant,  $F(2, 1056) = 335.29, p < .001, R^2 = .39$ . The hypothesized negative indirect effect was also significant. The whole model for the suppression analysis with in-group satisfaction as the outcome, self-esteem as the predictor, and collective narcissism as the suppressor was significant,  $F(2, 1056) = 396.00, p < .001, R^2 = .43$ , but the indirect effect was not significant (Table 1). The results replicated those of Studies 1-3 in support of Hypothesis 1.

The mediation model, testing Hypothesis 2, with self-esteem entered as the predictor, collective narcissism as the mediator, out-group derogation as the outcome, and in-group satisfaction as the covariate (PROCESS, Model 4; Hayes, 2017; 10,000 bootstrap samples and 95% bias-corrected bootstrap CI) was significant,  $R^2 = .03, F(3, 1055) = 9.12, p < .001$ . The hypothesized indirect effect of self-esteem on out-group derogation via collective narcissism was significant. The indirect effect of self-esteem on out-group derogation via in-group satisfaction with collective narcissism entered as a covariate was significant as well (Table 1).

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in the article analyses on two social distance items to be consistent with Study 3 practices.

Analyses on the 4-item composite yielded results similar to the reported ones (Supplementary Materials).



Unlike Study 3, the direct effect of self-esteem on out-group derogation was positive and not significant,  $b = .06$ ,  $SE = .05$ ,  $p = .23$ .

The results replicate those of Studies 1-3 supporting Hypothesis 1, and replicate the results of Study 3 supporting Hypothesis 2. Next, we sought to examine the replicability of our findings in another national and intergroup context using a measure of symbolic aggression.

### STUDY 5

In Study 5, we tested Hypotheses 1-2 in U.S. samples. We attempted to manipulate state self-esteem by pairing words related to the self with positively (vs. negatively) valenced words in an alleged cognitive flexibility task (Riketta & Dauenheimer, 2003). This manipulation was ineffective: It did not alter level of state self-esteem<sup>6</sup>. It also did not affect trait self-esteem measured after the manipulation, did not predict collective narcissism or in-group satisfaction, and did not moderate any of the hypothesized relationships (see Supplementary Materials for relevant analyses). Thus, we tested Hypotheses 1-2 using the continuous assessments of trait self-esteem, as in previous studies.

We focused on hostility towards Muslims, one of the most prevalent forms of prejudice in the USA since 2001 (Pew Research Center Forum, July 26, 2017). We did not collect information about participants' religion. Given that only 1% of the U.S. population is Muslim (Kosmin & Keysar, 2009), we thought that the representation of Muslim participants in our sample would be minimal, and so their responses would not affect substantively the reported results.

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<sup>6</sup>We used the State Self-Esteem Scale (Heatherton & Polivy, 1991) to gauge the effectiveness of the manipulation. The total score, along with the subscales' scores, were unaffected by the manipulation. Also, the total score was highly correlated with the trait self-esteem score,  $r(471) = .79$ ,  $p < .001$ . Given the redundancy, we did not analyze State Self-Esteem Scale scores (Supplementary Materials).

## Method

### Participants and Procedure

A total of 528 U.S. residents completed the survey via Amazon's Mechanical Turk (MTurk). Based on estimation from Study 3, we sampled on the conservative side expecting attrition. We implemented an attention check item in one of our scales instructing participants to select only the 'agree' option, and excluded those who selected other options ( $N = 47$ ). We also excluded 11 participants, who indicated that their nationality was not American. The final sample comprised 472 participants (274 women, 197 men, 3 other) aged between 18 and 77 years ( $M = 38.22$ ,  $SD = 13.30$ ).

Participants were randomly allocated to one of the two conditions (Supplementary Materials). Next, they completed measures of collective narcissism, in-group satisfaction, trait self-esteem, and symbolic aggression. Given that the manipulation affected the outcome variable (in a direction opposite to the predicted one), we controlled for condition and its interaction with self-esteem (our main predictor) in testing Hypothesis 1, and for interactions between condition and collective narcissism and between condition in-group satisfaction in testing Hypothesis 2. Analyses without these covariates yielded virtually identical results<sup>7</sup> (Supplementary Materials).

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<sup>7</sup>To find out if the state self-esteem manipulation affected the predicted relationships, we conducted a moderated mediation analysis (using Mplus 7.3 and requesting 10000 bootstrap samples) that included the manipulation as a moderator of all the relationships; that is, we tested the potential moderating role of the manipulation on all paths of the mediation (a, b, and c). We specified the distribution of the Voodoo Doll Task as negative binomial (see main analyses). We used the Maximum Likelihood (ML) estimator to test the indirect effect of trait self-esteem on symbolic aggression via collective narcissism controlling for in-group satisfaction. The predicted negative indirect effect of trait self-esteem on symbolic aggression via net collective narcissism was significant,  $b = -.31$ ,  $SE = .16$ ,  $p = .047$ . The interactions of condition and trait self-esteem on collective narcissism, and condition and collective narcissism on symbolic aggression, were not significant ( $b = -.74$ ,  $SE = .66$ ,  $p = .26$  and  $b =$

## Measures

**Trait self-esteem** was measured as before with the 10-item Rosenberg (1965) Self-Esteem Scale (1 = *strongly disagree*, 4 = *strongly agree*):  $\alpha = .90$ ,  $M = 3.02$ ,  $SD = .64$ .

**Collective narcissism** (Golec de Zavala et al., 2009;  $\alpha = .85$ ,  $M = 3.36$ ,  $SD = 1.57$ ) and **in-group satisfaction** (Leach et al., 2008;  $\alpha = .95$ ,  $M = 5.07$ ,  $SD = 1.7/6$ ) were measured as in prior studies. Response options ranged from 1 (*completely disagree*) to 6 (*completely agree*).

**Symbolic aggression** was assessed with the Voodoo Doll Task (DeWall et al., 2013), a measure based on the tendency to bestow objects with magical properties. Participants are asked to imbue an inanimate doll with features of real persons. This task exhibits appropriate responsiveness to laboratory provocations, shows excellent reliability over time, and correlates with other measures of aggression (Chester et al., 2015; DeWall et al., 2013). Responses to this task do not signify actual aggression, given that the victim does not experience direct harm. Rather, they capture symbolic aggression. However, there is a cognitive, emotional, and behavioral overlap between actual and symbolic forms of behavior, and this task engenders results similar to those of actual aggression (Chester & DeWall, 2016).

Participants received a picture of the voodoo doll according to an established procedure for online studies (Chester & DeWall, 2016). They were asked to imagine that the doll represents a Muslim person, and to indicate the number of pins they would stab into the doll using a slider that depicted pins 0 (no pins) to 51 ( $M = 3.96$ ,  $SD = 10.69$ ). Overall, 74.8% of participants did not insert any pins, 14.4% inserted 1-10 pins, and 10.8% inserted more

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.06,  $SE = .21$ ,  $p = .77$ , respectively). Indeed, in both conditions, the indirect effect of trait self-esteem on symbolic aggression via collective narcissism was negative and significant. Thus, the manipulation did not affect any of the hypothesized relationships. To err on the side of caution, we present analyses consistent with our prior studies controlling for condition and its interaction with trait self-esteem (for path a) and for condition and its interaction with trait self-esteem, in-group satisfaction, and collective narcissism (for path b). In Supplementary Materials, we present analyses without covariates.

than 10 pins. In the Voodoo Doll Task, each count of a pin represents a discrete event in a specified temporal period. The index of dispersion (or the variance-to-mean ratio) of the counts was 28.87 indicating overdispersion (i.e., a situation in which the variance of responses is greater than their mean) and suggesting a negative binomial distribution of the counts (Long 1997). (For an alternative treatment of this measure, based on Chester & Lasko, 2019, see Supplementary Materials.<sup>8</sup>).

### Results and Discussion

Collective narcissism and in-group satisfaction were positively correlated. In-group satisfaction was positively correlated with self-esteem. Collective narcissism and in-group satisfaction were positively correlated, whereas self-esteem was negatively correlated with symbolic aggression (Table 6).

First, we tested Hypothesis 1 that self-esteem and collective narcissism are negatively related, and in-group satisfaction suppresses this relationship. The whole model (PROCESS, Model 4; Hayes, 2017; 10,000 bootstrap samples and 95% bias-corrected bootstrap CI) for self-esteem as the predictor, collective narcissism as the outcome, as well as in-group satisfaction, condition, and the interaction of condition and self-esteem as covariates was significant,  $F(4, 459) = 23.44, p < .001, R^2 = .17$ . After the positive overlap between collective narcissism and in-group satisfaction was partialled out, the relationship between self-esteem and collective narcissism became negative and significant. The suppression effect by in-group satisfaction was significant. The whole model for in-group satisfaction as the outcome was

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<sup>8</sup>Although a large percentage of participants chose 0 in the Voodoo Doll Task, we had no reason to expect that the excess of zeros was created via another process other than the count. That is, we had no reason to suspect a second zero-inflating process affecting the distribution. Nevertheless, we re-ran the analyses to test Hypothesis 2 specifying a zero inflated binomial distribution. The analysis yielded results virtually identical to the reported ones, indicating that our specification of a negative binomial distribution was appropriate. These results are available from the link: <https://osf.io/47qt5/>.

also significant,  $F(3, 459) = 29.23, p < .001, R^2 = .20$ . The suppression effect via collective narcissism was not significant, replicating the results of Studies 1-4 (Table 1).

Next, we tested Hypothesis 2 analyzing the indirect effect of self-esteem on symbolic aggression via collective narcissism. We entered as covariates in-group satisfaction as well as condition and its interactions with self-esteem (for path a), and additionally its interactions with collective narcissism and in-group satisfaction (for path b). We used Mplus 8.3 with maximum likelihood estimation and 10,000 bootstrapped samples for confidence intervals to estimate all effects. The whole model was significant,  $R^2 = .17, z = 4.95, p < .001$ . As expected and consistent with Hypothesis 2, the negative indirect effect of self-esteem on symbolic aggression via collective narcissism was significant. In-group satisfaction suppressed this indirect relationship. In-group satisfaction had no unique association with symbolic aggression. It did not mediate the link between self-esteem and symbolic aggression (Table 1). The direct link between self-esteem and symbolic aggression was not significant,  $b = -.08, SE = .50, p = .87$ . Thus, the Study 5 results are in line with Hypotheses 1-2 in indicating that the relationships specified by Hypothesis 2 can be extended beyond out-group derogation to its behavioral consequences such as intergroup aggression.

In the final two studies, we solicited stronger evidence for the directionality of the relationships anticipated by Hypothesis 2. In Study 6, we used a longitudinal design assessing out-group derogation. In Study 7, we used an experimental design examining the indirect effect of state self-esteem on symbolic aggression via collective narcissism.

## STUDY 6

In Study 6, we tested Hypotheses 1-2 in a four-wave longitudinal design. Additionally, we explored whether out-group derogation assessed in T1 increases (directly or indirectly) self-esteem measured later, as suggested by social identity theory (Abrams & Hogg, 1988). Our assessment of out-group derogation consisted of social distance towards Syrian refugees.

### Method

#### Participants and Procedure

We collected data via the Ariadna Research Panel. The study was conducted over a year after Study 2 and relied on different participants. The first data collection wave occurred

among 749 participants (394 women, 355 men) ranging in age from 18 to 78 years ( $M = 44.36$ ,  $SD = 15.25$ ). The second data collection wave occurred six weeks later, recruiting 598 participants from the previous wave (312 women, 286 men) with an age range between 18 and 78 years ( $M = 45.17$ ,  $SD = 14.99$ ). The third wave occurred four weeks later resulting in 481 participants from the previous wave (245 women, 236 men) of an age range between 18 and 78 years ( $M = 45.34$ ,  $SD = 14.76$ ). Finally, the fourth wave was gathered 16 weeks later, yielding 410 participants who completed all four waves (209 women, 201 men; age range = 18-78 years,  $M = 46.02$ ,  $SD = 14.66$ ). We report analyses on this last batch of participants.

### Measures

Unless otherwise indicated, response options ranged from 1 (*totally disagree*) to 6 (*totally agree*).

**Self-esteem** (Dzwonkowska et al., 2008) was assessed as in previous studies: T1:  $\alpha = .87$ ,  $M = 4.12$ ,  $SD = .70$ ; T2:  $\alpha = .87$ ,  $M = 4.14$ ,  $SD = .73$ ; T3:  $\alpha = .87$ ,  $M = 4.12$ ,  $SD = .72$ ; T4:  $\alpha = .86$ ,  $M = 4.14$ ,  $SD = .73$ .

**Collective narcissism** (Golec de Zavala et al., 2009) was assessed as in previous studies: T1:  $\alpha = .91$ ,  $M = 3.68$ ,  $SD = 1.08$ ; T2:  $\alpha = .93$ ,  $M = 3.57$ ,  $SD = 1.14$ ; T3:  $\alpha = .93$ ,  $M = 3.59$ ,  $SD = 1.12$ ; T4:  $\alpha = .92$ ,  $M = 3.52$ ,  $SD = 1.11$ .

**In-group satisfaction** (Jaworska, 2016) was assessed as in previous studies: T1:  $\alpha = .93$ ,  $M = 4.37$ ,  $SD = 1.02$ ; T2:  $\alpha = .94$ ,  $M = 4.28$ ,  $SD = 1.11$ ; T3:  $\alpha = .95$ ,  $M = 4.29$ ,  $SD = 1.09$ ; T4:  $\alpha = .94$ ,  $M = 4.32$ ,  $SD = 1.00$ .

**Out-group derogation** was assessed as social distance from refugees with essentially the same items as those of Study 4: “Would you have anything against someone from my family marrying a Syrian refugee?” and “Would you have anything against a Syrian refugee family moving into the neighboring apartment/house?” (1 = *not at all*, 7 = *definitely yes*)<sup>9</sup>: T1:

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<sup>9</sup>Study 6, like Study 4, included two additional items measuring attitudes towards Syrian refugees. As in Study 4, analyses with the 4-item composite index produced similar results to the reported ones. Analyses are available upon request.

$\alpha = .80$ ,  $M = 4.05$ ,  $SD = 1.37$ ; T2:  $\alpha = .83$ ,  $M = 4.00$ ,  $SD = 1.43$ ; T3:  $\alpha = .81$ ,  $M = 4.09$ ,  $SD = 1.36$ ; T4:  $\alpha = .83$ ,  $M = 3.88$ ,  $SD = 1.38$ .

## Results and Discussion

### Data Preparation

We generated residualized measures of collective narcissism and in-group satisfaction in each of the four waves using the method employed in Study 2. Again, to put all measures on comparable scales, we recoded all residual measures to run from 0 to 1 (T1 residual collective narcissism:  $M = 0.57$ ,  $SD = 0.15$ ; T2 residual collective narcissism:  $M = 0.53$ ,  $SD = 0.13$ ; T3 residual collective narcissism:  $M = 0.67$ ,  $SD = 0.16$ ; T4 residual collective narcissism:  $M = 0.58$ ,  $SD = 0.17$ ; T1 residual in-group satisfaction:  $M = 0.56$ ,  $SD = 0.14$ ; T2 residual in-group satisfaction:  $M = 0.52$ ,  $SD = 0.13$ ; T3 residual in-group satisfaction:  $M = 0.50$ ,  $SD = 0.15$ ; T4 residual in-group satisfaction:  $M = 0.55$ ,  $SD = 0.14$ ). Though we did not residualize self-esteem or out-group derogation, for comparability we recoded all four self-esteem measures to range from 0 to 1 (T1:  $M = 0.57$ ,  $SD = 0.16$ ; T2:  $M = 0.56$ ,  $SD = 0.17$ ; T3:  $M = 0.58$ ,  $SD = 0.16$ ; T4:  $M = 0.60$ ,  $SD = 0.16$ ), and we did the same for all four out-group-derogation measures (T1:  $M = 0.51$ ,  $SD = 0.23$ ; T2:  $M = 0.50$ ,  $SD = 0.24$ ; T3:  $M = 0.52$ ,  $SD = 0.23$ ; T4:  $M = 0.48$ ,  $SD = 0.23$ ).<sup>10</sup>

### Data Analysis

To test Hypotheses 1-2, we estimated a cross-lagged panel mediation model (Cole & Maxwell, 2003, Model 7, p. 563; see also Selig & Preacher, 2009) using the T1, T2, T3 and T4 measures of out-group derogation, residual collective narcissism, residual in-group

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<sup>10</sup>To examine whether participant attrition across the four waves was associated with the study variables, we compared T1 participants who completed all four waves with those who failed to do so on all T1 variables. Participants did not differ on self-esteem,  $diff = 0.001$ ,  $t(747) = 0.12$ ,  $p = .25$ ,  $d = 0.01$ ; residualized collective narcissism,  $diff = -0.007$ ,  $t(747) = -0.59$ ,  $p = .25$ ,  $d = -0.04$ ; residualized in-group satisfaction,  $diff = 0.017$ ,  $t(747) = 1.61$ ,  $p = .11$ ,  $d = 0.12$ ; or out-group derogation,  $diff = 0.014$ ,  $t(747) = 0.77$ ,  $p = .25$ ,  $d = 0.06$ . Thus, we observed no panel-attrition differences with respect to our key study variables.

satisfaction, and self-esteem. We illustrate the model in Figure 2. We used path analysis with observed variables to estimate this model in Stata 14 (StataCorp, 2015). Besides the specifications shown in Figure 2, we allowed the disturbance terms for all four variables to correlate with one another at T2, T3, and T4, and we allowed the T1 exogenous measures of all four variables to correlate. To reflect shared measurement variance due to the residualized construction of the collective-narcissism and in-group satisfaction variables, we also allowed the three disturbances for collective narcissism at T2, T3, and T4 to correlate with one another and the three disturbances for in-group satisfaction at T2, T3, and T4 to correlate with one another; removing these correlations did not change the core results for the tests of Hypotheses 1 and 2.<sup>11</sup>

Table 6 reports the zero-order correlations among the input variables, and Table 7 reports the direct-effect structural estimates from the cross-lagged panel mediation model; coefficients central to our hypothesis tests are bolded. We begin by examining the coefficients testing Hypothesis 1 in the context of the cross-lagged panel mediation model (Cole & Maxwell, 2003). First, the standardized estimates for (1) the regression of T2 residual collective narcissism and T2 residual in-group satisfaction on T1 self-esteem, and (2) the regression of T3 residual collective narcissism and T3 residual in-group satisfaction on T2 self-esteem were consistent with the hypothesis. Net of T1 residual collective narcissism and in-group satisfaction, self-esteem at T1 was negatively associated with residual collective narcissism at T2 ( $\beta = -.09, p < .05$ ). Net of T1 residual collective narcissism and in-group satisfaction, self-esteem at T1 was positively associated with residual in-group satisfaction at T2 ( $\beta = .11, p < .01$ ). Similarly, controlling for T2 residual collective narcissism and in-group satisfaction, self-esteem at T2 was negatively associated with residual collective narcissism at T3 ( $\beta = -.09, p < .01$ ); controlling for T2 residual collective narcissism and in-group

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<sup>11</sup>Though we were primarily interested in the direct and indirect-effect estimates pertinent to Hypotheses 1-2, we did examine the model's global fit. The fit indices showed an adequate fit according to the CFI and SRMR (0.93 and 0.07, respectively, with  $\chi^2[44] = 476.31, p < .001$ ). Its fit was less adequate according to the RMSEA (0.16).



satisfaction, self-esteem at T2 was positively associated with residual in-group satisfaction at Time 3 ( $\beta = .11, p < .001$ ).<sup>12</sup> These results closely replicate those of Study 2.<sup>13</sup>

In regards to Hypothesis 2, evidence for the hypothesized indirect effects first requires that we observe net effects of T2 collective narcissism and in-group satisfaction in the equation predicting T3 out-group derogation (controlling for T2 collective narcissism, in-group satisfaction, as well as out-group derogation and Time 1 self-esteem) and net effects of T3 collective narcissism and in-group satisfaction in the equation predicting T4 out-group derogation (controlling for T3 collective narcissism, in-group satisfaction, as well as out-group derogation and Time 2 self-esteem). We report the relevant estimates in Table 8. The effect of T2 collective narcissism on T3 out-group derogation ( $\beta = .15, p < .001$ ) and the effect of T2 in-group satisfaction on T3 out-group derogation ( $\beta = .05, p < .001$ ) were positive and significant. The effect of T3 collective narcissism on T4 out-group derogation was

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<sup>12</sup>Though not part of the key indirect-effect pathways in the cross-lagged panel mediation model, results also indicated that: (1) self-esteem at T3 was negatively associated with residual collective narcissism at T4 net of T3 residual collective narcissism and in-group satisfaction ( $\beta = -.08, p = .04$ ); and (2) self-esteem at T3 was directionally and positively related to residual in-group satisfaction at T4 net of T1 residual collective narcissism and in-group satisfaction ( $\beta = .06, p = .18$ ).

<sup>13</sup>As in Study 2, we also obtained partial evidence for reverse relationships involving collective narcissism, in-group satisfaction, and self-esteem. Specifically, T2 in-group satisfaction was positively associated with T3 self-esteem net of T2 collective narcissism, self-esteem, and T1 out-group derogation ( $\beta = .21, p < .001$ ). T2 collective narcissism was also positively associated with T3 self-esteem net of T2 in-group satisfaction, self-esteem, and T1 out-group derogation ( $\beta = .09, p = .04$ ). All other reverse paths from collective narcissism and in-group satisfaction to self-esteem were statistically indistinguishable from zero (from T1 to T2:  $\beta = -.02$  and  $\beta = .05$ , respectively; from T3 to T4:  $\beta = -.0003$  and  $\beta = .002$ , respectively; all  $ps > .20$ ).

positive and significant ( $\beta = .13, p < .01$ ), but the effect of T3 in-group satisfaction on T4 out-group derogation ( $\beta = -.04, p = .25$ ) was not statistically distinguishable from zero.<sup>14</sup>

We estimated whether the hypothesized indirect effects connecting low self-esteem to out-group derogation via residual collective narcissism and in-group satisfaction were significant. The version of the cross-lagged panel mediation model that we estimated included three indirect pathways connecting self-esteem and out-group derogation via collective narcissism and three indirect pathways connecting self-esteem and out-group derogation via in-group satisfaction (Cole & Maxwell, 2003). We estimated these individual indirect effects, and we also estimated a total indirect effect for each mediator by summing the three indirect effects involving that mediator (Table 9). All component estimates used to compute the indirect effects accounted for the lagged version of the outcome variable in the previous wave, helping to rule out endogeneity in each step of the causal chain. For testing purposes, we computed bias-corrected bootstrap 95% confidence intervals for the six individual indirect effects and the two total indirect effects involving each mediator using 10,000 bootstrap samples.

In regards to the estimates and confidence intervals, all three individual indirect effects involving collective narcissism were as per Hypothesis 2 (Table 9). In particular, all were negative (-.013, -.016, -.012) and their 95% confidence intervals did not include zero. Moreover, the total indirect effect involving collective narcissism was also negative (-.041), and its confidence interval did not include zero. In contrast, the three individual indirect effects involving in-group satisfaction and the total of the indirect effect involving in-group satisfaction were smaller in magnitude and did not differ from zero.

Taken together, the results of Study 6 bolster Hypothesis 2. The negative indirect link between self-esteem and out-group derogation via collective narcissism is consistently

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<sup>14</sup>Though not part of the key indirect effect pathways in the cross-lagged panel mediation model, the model estimates also indicated that T1 collective narcissism ( $\beta = .23, p < .001$ ) and T1 in-group satisfaction ( $\beta = .11, p = .051$ ) were both positively associated with T2 out-group derogation net of T1 out-group derogation.

supported by the data. The positive indirect link between self-esteem and out-group derogation via in-group satisfaction does not receive consistent support in the longitudinal data. We next tested the expected directionality of the hypothesized relationships in an experimental design.

### STUDY 7

In Study 7, we focused on the role of state self-esteem following the proposition that corollary two of the self-esteem hypothesis may be more applicable to state rather than trait self-esteem (Abrams & Hogg, 1988). Trait self-esteem refers to a person's global appraisal of their value—a relatively enduring disposition across situations (Rosenberg, 1965). State self-esteem, on the other hand, refers to a person's self-appraisal at a current moment. This appraisal is subject to considerable fluctuation, as indicated both by self-report (Heatherton & Polivy, 1991) and neuroscientific (Eisenberger et al., 2011) data.

We experimentally manipulated self-esteem via social exclusion. To do so, we relied on the sociometer theory of self-esteem (Leary & Baumeister, 2000), which states that the function of self-esteem is to monitor the degree to which a person is included by others. Thus, self-esteem should be affected by social inclusion and exclusion. Indeed, social exclusion decreases self-esteem (Hartgerink, Van Beest, Wicherts, & Williams, 2015; Leary, 1990; Williams & Nida, 2011)<sup>15</sup>. Specifically, social exclusion during Cyberball, a computer-based ball tossing game designed to manipulate exclusion versus inclusion (Williams & Jarvis, 2006), lowers state self-esteem as assessed by the Need Satisfaction Scale developed for use

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<sup>15</sup>Along with decreasing state self-esteem, social exclusion presents a threat to personal control, meaningful existence, and belonging (Jamieson, Harkins, & Williams, 2010). In Supplementary Materials, we report analyses indicating that only a decrease in state self-esteem resulted in rise in net collective narcissism. Personal control temporarily decreased by social exclusion does not raise net collective narcissism when self-esteem is controlled. Threats to meaningful existence or belonging were also temporarily decreased by social exclusion, but were not associated with collective narcissism or in-group satisfaction. These results are in line with Study 3 findings and contradict prior work (Cichocka et al., 2018).

in Cyberball studies (Hartgerink et al., 2015; Jamieson, Harkins, & Williams, 2010; Williams, Cheung, & Choi, 2000).

We adapted Cyberball to an intergroup setting and used the self-esteem subscale of the Need Satisfaction Scale to assess if social exclusion lowers self-esteem. We also examined whether social exclusion increases collective narcissism and decreases in-group satisfaction (Hypothesis 1). Finally, we examined if intergroup exclusion precipitates symbolic aggression towards the excluding out-group via collective narcissism (Hypothesis 2) while controlling for the overlap between collective narcissism and in-group satisfaction.

## Method

### Participants and Procedure

We collected data online from 253 American MTurk workers. We followed Fritz and MacKinnon's recommendations (2007) to obtain the sample size required for testing the indirect effect anticipated by Hypothesis 2. We used the large effect-size estimates for path a, as indicated by a meta-analytical review of 120 Cyberball studies (Hartgerink et al., 2015), and we used halfway effect sizes for estimating path b, as indicated in Study 5. Based on bias-corrected bootstrap confidence intervals to test the indirect effects, Fritz and MacKinnon recommend a sample size of 115 participants. We conservatively oversampled and ceased data collection on a predetermined date.

We excluded participants who completed the survey under 6 minutes, as our pre-tests suggested that this is the minimum time necessary to answer all questions and complete the Cyberball game ( $N = 29$ ). Following this game, we asked participants to report whether their national team (i.e., USA) was represented during the game. Participants who responded 'no' were either not paying attention or were not U.S. nationals, and so we removed their data from further consideration ( $N = 5$ ). The final sample consisted of 220 participants (136 women, 84 men) ranging in age from 18 to 73 years ( $M = 36.24$ ,  $SD = 12.42$ ).

Participants took part in a study allegedly on the impact of cognitive load on mental visualization. They responded to demographic questions before proceeding to the intergroup Cyberball game. In the classic Cyberball game, each participant is led to believe that they play the ball tossing game via internet with two other participants. The players are represented by

avatars on the computer screen. Rather than disclosing the true aim of this task, participants are told that the research concerns mental visualization, and that, instead of focusing on their performance in the game, they should focus on visualizing the other players and the environment of the game as vividly as possible. In reality, the throws are pre-programmed to reflect inclusion or exclusion.

In our study, participants were led to believe that they were randomly allocated to observe (rather than play) two national teams tossing the ball to each other. Participants watched a pre-programmed game in which the team representing their national in-group was either included in the game ( $N = 118$ ) or excluded from it ( $N = 102$ ). The screen showed the national team of the participant (three blue avatars with the U.S. flag next to them, with the word 'USA' written above the flag) playing against an out-group (three red avatars with the British flag next to them, and the word 'Britain' written above the flag). In the inclusion condition, the ball was tossed 30 times between players, with both teams receiving the ball an equal number of times. In the exclusion condition, the American players received only three ball tosses in the beginning and were then excluded from the game by the British players, who tossed the ball among themselves. After the Cyberball sequence, participants responded to manipulation check questions and measures of need satisfaction. We then assessed symbolic aggression. Finally, we measured collective narcissism and in-group satisfaction (presented in a separate random order for each participant). A probe ("What do you think this experiment was about?") concluded the experimental session. No participant guessed correctly the purpose of the experiment.

### Measures

**Manipulation check** questions were similar to those of previous Cyberball studies (Jamieson et al., 2010; Wirth & Williams, 2009). First, we asked: "Assuming the ball should be thrown to each team equally (50% of throws to players of each team), what percentage of throws your national team received in the Cyberball game? (type a number between 0 and 100)" ( $M = 30.92$ ,  $SD = 21.73$ ). Second, participants responded (1 = *not at all*, 5 = *extremely*) to two group statements ("I felt my group was ignored" and "I felt my group was excluded";  $\alpha = .99$ ,  $M = 2.59$ ,  $SD = 1.61$ ) and two personal statements ("I was ignored" and "I was

excluded;”  $\alpha = .93$ ,  $M = 3.07$ ,  $SD = 1.55$ ). Finally, we assessed via a subscale of the Need Satisfaction Scale (Jamieson et al., 2010; “My self-esteem was high,” “I felt good about myself,” “I felt liked,” “I felt satisfied,” and “I felt insecure”—reverse coded; 1 = *not at all*, 5 = *extremely*) whether intergroup exclusion affected state self-esteem during the game ( $\alpha = .86$ ,  $M = 3.06$ ,  $SD = .95$ ).

**Collective narcissism** (Golec de Zavala et al., 2009;  $\alpha = .90$ ,  $M = 3.37$ ,  $SD = 1.61$ ) and **in-group satisfaction** (Leach et al., 2008;  $\alpha = .93$ ,  $M = 5.03$ ,  $SD = 1.57$ ) were assessed as in prior studies (1 = *totally disagree*, 7 = *totally agree*).

**Symbolic aggression** was assessed as symbolic aggression towards the excluding out-group using a Voodoo Doll Task similar to that of Study 5. Participants were presented with an outline of a human figure, identical to the out-group avatars they saw during the Cyberball game. As per standard practice (Chester & DeWall, 2016), participants read the typical instruction, adjusted for the present study: “Your observation of the Cyberball game in this study may have caused some negative effects. In order to release this negative energy, we have provided a picture of a doll for which you should select the number of pins you would like to stab it with. Please imagine this doll as one of the British Cyberball players who you visualized.” Participants indicated the number of pins they would stab into the doll using a slider depicting pins 0 to 51 ( $M = 7.98$ ,  $SD = 14.26$ ). Overall, 48.6% of participants did not insert any pins, 31.4% inserted 1-10 pins, and 20% inserted more than 10 pins. The index of dispersion of the counts was 25.47 indicating overdispersion and suggesting negative binomial distribution of the counts (Long 1997). Similar to Study 5, we specified the distribution as negative binomial. (For an alternative treatment of this measure see Supplementary Materials.<sup>16</sup>).

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<sup>16</sup>As in Study 5, we re-tested Hypothesis 2 specifying a zero inflated negative binomial distribution for symbolic aggression. The results were virtually identical to the reported ones <https://osf.io/47qt5/>.

## Results and Discussion

First, we conducted simple mean comparisons to check the effectiveness of the experimental manipulation. The mean differences in responses to each of the manipulation check questions were significant and in the expected direction. Following the game, participants in the exclusion (vs. inclusion) condition perceived that their group received the ball less often, felt that their group was excluded, and felt personally excluded. Importantly, their state self-esteem was significantly lower in the exclusion condition compared to the inclusion condition. In addition, symbolic aggression was higher in the exclusion than the inclusion condition (Table 10).

Collective narcissism and in-group satisfaction were positively correlated,  $r(220) = .63, p < .001$ . The total effects of condition on collective narcissism and in-group satisfaction were not significant (Table 10). To test Hypothesis 1, we carried out two separate univariate general linear models (Table 10). First, we examined whether collective narcissism was higher in the condition that lowered versus increased state self-esteem, using in-group satisfaction as a covariate. This analysis indicated significant main effects of condition and in-group satisfaction. Participants in the condition that lowered self-esteem reported higher levels of collective narcissism net of in-group satisfaction ( $M = 3.58, SE = 0.12$ ) than participants in the condition that increased self-esteem ( $M = 3.20, SE = 0.11$ ). Next, we examined whether in-group satisfaction was higher in the condition that increased self-esteem in comparison to the condition that decreased self-esteem, using collective narcissism as a covariate. This analysis yielded significant main effects of condition and collective narcissism. Participants in the condition that increased self-esteem reported higher levels of in-group satisfaction ( $M = 5.22, SE = 0.11$ ) in comparison to participants in the condition that decreased self-esteem ( $M = 4.82, SE = 0.12$ ).

As shown in Table 11, the indirect effects of condition on collective narcissism via in-group satisfaction and the indirect effects of the research conditions on in-group satisfaction were not significant. Thus, although partialling out the variance shared by collective narcissism and in-group satisfaction allowed us to observe the opposite effects of condition on those variables, the suppression effects were not significant. These results are in line with

Hypothesis 1, as they indicate that the decrease in self-esteem leads to a decrease in collective narcissism when the overlap between collective narcissism and in-group satisfaction is accounted for. However, these results are not in line with findings of Studies 1, 3, 4 and 5, which indicated significant suppression effect of in-group satisfaction on the negative relationship between self-esteem and collective narcissism.

Next, to test Hypothesis 2, we turned to the indirect effect of experimentally manipulated self-esteem on symbolic aggression via collective narcissism entering in-group satisfaction as a covariate. We used Mplus 8.3 with maximum likelihood estimation and 10,000 bootstrapped samples for confidence intervals to estimate all effects. We followed the same method as in Study 5, and fitted the model using negative binomial distribution for the outcome variable. The whole model was significant,  $R^2 = .41$ ,  $z = 9.15$ ,  $p < .001$ . The hypothesized indirect effect was also significant. In the condition that lowered self-esteem, collective narcissism increased symbolic aggression relative to the condition that increased self-esteem. Collective narcissism mediated the effect of the condition on symbolic aggression, and in-group satisfaction suppressed this effect. The direct effect of condition on symbolic aggression was significant as well,  $b = .96$ ,  $SE = .29$ ,  $p = .001$ . Participants in the condition that lowered self-esteem pushed more pins into the Voodoo doll than participants in the condition that boosted self-esteem. Additionally, we examined whether the effect of the research condition on symbolic aggression was mediated by in-group satisfaction. We entered condition as the predictor, in-group satisfaction as the mediator, symbolic aggression as the outcome, and collective narcissism as the covariate. The whole model was significant,  $R^2 = .41$ ,  $z = 9.21$ ,  $p < .001$ , but the indirect effect of in-group satisfaction was not significant.

These results support Hypothesis 2. They indicate that self-esteem, undermined by intergroup exclusion, leads to out-group derogation uniquely via collective narcissism. The results replicate the Study 5 findings, showing that in-group satisfaction did not uniquely mediate the relationship between self-esteem and symbolic aggression. In addition, the results illustrated that lowered self-esteem predicted symbolic aggression directly.



### **General Discussion**

The cumulative evidence is supportive of Hypothesis 1, namely, that collective narcissism and in-group satisfaction have opposite and unique relationships with self-esteem. The results of cross-sectional, longitudinal, and experimental studies converge in indicating that the unique association between self-esteem and collective narcissism is negative, whereas the unique association between self-esteem and in-group satisfaction is positive. In all studies, the positive overlap between collective narcissism and in-group satisfaction obscured the negative relationship between collective narcissism and self-esteem. Indeed, the negative link between self-esteem and collective narcissism could only be observed when the positive overlap between collective narcissism and in-group satisfaction was partialled out. That in most studies in-group satisfaction suppresses the negative relationship between self-esteem and collective narcissism explains why previous work found no correlation between self-esteem and collective narcissism (Golec de Zavala et al., 2009, 2016).

The cumulative evidence is also consistent with Hypothesis 2, namely, that collective narcissism uniquely mediates the link between low self-esteem and out-group derogation. In all studies, low self-esteem predicted out-group derogation via collective narcissism. Again, this indirect relationship was observed only when the positive overlap between collective narcissism and in-group satisfaction was partialled out. Such findings help to explain the apparent lack of empirical support for corollary two of the self-esteem hypothesis, which states that low self-esteem motivates out-group derogation (Abrams & Hogg, 1988; Rubin & Hewstone, 1998). The association between low self-esteem and out-group derogation does exist. However, it is indirect, mediated by collective narcissism, and occurs only when collective narcissism does not overlap with in-group satisfaction. Moreover, those findings generalize to intergroup aggression. In Studies 5 and 7, low self-esteem predicted symbolic aggression via collective narcissism.

#### **Self-Esteem Is Positively Related to In-Group Satisfaction**

The results of cross-sectional, longitudinal, and experimental studies are remarkably consistent, indicating that the relationship between self-esteem (trait, state, and threatened) and collective narcissism is negative, whereas the relationship between self-esteem (trait,

state, and boosted) and in-group satisfaction is positive. Moreover, the results of Study 2, and to some extent those of Study 6, suggest that the positive relationship between self-esteem and in-group satisfaction is reciprocal. Self-esteem increases in-group satisfaction *and* in-group satisfaction increases self-esteem. Furthermore, the positive association between self-esteem and in-group satisfaction is independent of collective narcissism. It can be observed whether the positive overlap between collective narcissism and in-group satisfaction is partialled out *and* when it is not.

The reciprocal, positive relationship between self-esteem and in-group satisfaction corroborate previous findings that individuals with high self-esteem project their positive self-evaluation onto their in-groups (Gramzow & Gaertner, 2005; Van Veelen et al., 2011), and that positive social identification increases self-esteem and positively contributes to mental health (Cruwys et al., 2014; Jetten et al., 2014). Further, the results align with previous work indicating that individuals with high self-esteem feel in a position to act on behalf of their in-group to enhance its positive evaluation (Amiot & Sansfaçon, 2011; Jans et al., 2012; Legaut & Amiot, 2014). Such findings concur broadly with Erikson's (1968) theorizing that acting on behalf of one's community is a motivation endorsed by people at advanced levels of ego development characterized by stable self-esteem and autonomy. A historical example of such a process is the successful change in the construal of national identity brought about by leaders of the Solidarity movement that hastened the overthrow of the Communist regime in Poland. Leaders of this movement—'entrepreneurs' of a new national identity (Reicher, Hopkins, Levine, & Rath, 2005)—exhibited stable self-esteem and autonomy, resisting retribution, in the name of improving the group that they held in high esteem (Kuroń, 2011).

Our results further indicate that the positive link between self-esteem and in-group satisfaction interferes with the involvement of low self-esteem into the intergroup processes. This does not mean, though, that low self-esteem is irrelevant as a predictor of out-group derogation and intergroup aggression. Instead, the findings point to an inherent complexity in the way self-esteem is implicated in beliefs about the in-group and in intergroup attitudes and behavior.

### **Self-Esteem Is Negatively Related to Collective Narcissism**

The results supporting Hypothesis 1 clarify the construct of collective narcissism. They indicate that low self-esteem may become tied to collective-narcissist resentment over the in-group's unrecognized importance. Collective narcissism, then, may (at least partially) represent an attempt to compensate for low self-esteem. A historical example of a social context that undermined individual self-esteem and led to a rise in collective narcissism was the spread of fascist ideology after the Great Depression of the 1930s. According to Frankfurt School theorists (Adorno, 1997; Fromm, 1973), the rapid expansion of the capitalist economy and then the Great Depression undercut the stability of the traditional bases with respect to which people assessed their self-esteem. This was followed by widespread support for the fascist narrative about national superiority and entitlement.

The recent and prevalent wave of populism across nations can also be linked to analogous economic and societal conditions. National collective narcissism stands behind the endorsement of populist parties, policies, and politicians (Federico & Golec de Zavala, 2017; Golec de Zavala, Guerra, & Simão, 2017; Marchlewska et al., 2018). Also, a detailed analysis of the populist message indicates that the collective-narcissist belief about the lost grandeur of the in-group lies at the core of populist beliefs (Golec de Zavala et al., 2019). In line with results linking undermined self-esteem to collective narcissism, the increase in support of populism in Europe can be linked to the 2008 Global Financial Crisis and the broader societal changes in Western countries that led to empowerment of many previously disenfranchised groups such as immigrants, ethnic and cultural minorities, women, and the LGBT+ community (Inglehart & Norris, 2016). The financial crisis caused many people to lose economic status to which they felt entitled. Moreover, broader societal changes towards greater equality between social groups produced a sense of lost group-based privilege. Such conditions are likely to engender uncertainty about self-esteem and produce a motivation, shared by some group members, to use the in-group instrumentally as a means of enhancing self-esteem.

When the in-group is used to restore undermined self-esteem, the self cannot be separated from the in-group, and group members invest in demanding that their in-group is

granted special recognition and treatment by others. The results from our longitudinal studies indicate that this instrumental investment in the in-group's greatness to compensate for undermined self-esteem is not necessarily successful. Although low self-esteem consistently predicted stronger collective-narcissist beliefs weeks later, holding collective-narcissist beliefs about the in-group generally did not reliably predict higher self-esteem later (except once T2 collective narcissism positively predicting T3 self-esteem). Thus, the investment of self-esteem in demanding and monitoring positive recognition of the in-group does not seem to raise self-esteem.

The results linking collective narcissism to low self-esteem corroborate previous findings that collective narcissism is uniquely associated with negative emotionality and is uniquely, negatively associated with social connectedness and prosocial emotions. Those studies linked collective narcissism to a genetically influenced hypersensitivity to negative stimuli (Golec de Zavala, 2019). They indicate that individuals experiencing deficits in regulation of negative emotions may gravitate towards collective narcissism. Such interpretation bodes well with Adorno's (1963/1998) and Fromm's (1973) claims that collective narcissism is a response to 'ego fragility.'

**Corollary Two: Self-Esteem is Negatively Related to Out-group Derogation and to Intergroup Aggression via Collective Narcissism**

It has been suggested that low self-esteem may motivate out-group derogation only in special cases (Abrams & Hogg, 1988). Our results support this possibility and clarify that low self-esteem motivates out-group derogation by eliciting collective narcissism. Although, as proposed by Abrams and Hogg (1998; see also Martiny & Rubin, 2016), threatened state self-esteem in our research was related to symbolic aggression, trait self-esteem also predicted out-group derogation and symbolic aggression towards various out-groups via collective narcissism. Specifically, low trait self-esteem indirectly predicted anti-Semitism and prejudice towards Syrian refugees in Poland as well as symbolic aggression towards Muslims in the U.S. Moreover, state self-esteem experimentally threatened by social exclusion resulted in retaliatory aggression towards the excluding out-group, and this relationship was uniquely mediated by collective narcissism.

The findings linking collective narcissism to out-group derogation and intergroup aggression align with research showing that collective narcissism is related to prejudice (Golec de Zavala et al., 2013a) and to aggressive retaliation to threats to the in-group's image (Golec de Zavala, Cichocka & Iskra-Golec, 2013b; Golec de Zavala et al., 2016) or perceived hostility from out-groups (Dyduch-Hazar, Mrozinski, & Golec de Zavala, 2019; Golec de Zavala & Cichocka, 2012; Golec de Zavala et al., 2009, 2019). The present findings also align with research indicating that the positive overlap between collective narcissism and in-group satisfaction obscures the unique, negative link between in-group satisfaction and out-group derogation (Golec de Zavala et al., 2013a). Consistent with those studies, collective narcissism suppressed the negative relationship between in-group satisfaction and out-group derogation in Studies 3-4. However, in-group satisfaction was not significantly associated with symbolic aggression whether its positive overlap with collective narcissism was partialled out or not. This finding also concurs with prior work in which in-group satisfaction was not significantly associated with retaliatory aggression even after controlling for its overlap with collective narcissism (Golec de Zavala et al., 2013b). In contrast, in current (and previous) research, the positive relationship between collective narcissism and out-group derogation and intergroup aggression was significant and positive.

Collective narcissism, then, may be a form of in-group favoritism that is chronically linked to out-group derogation and intergroup aggression, or, to put it differently, a form of in-group love that is linked to out-group hate (Brewer, 1999). Yet, when it does not overlap with collective narcissism, in-group satisfaction is a form of in-group favoritism that is related to out-group tolerance and unrelated to intergroup aggression, or a form of in-group love devoid of out-group hate that can sometimes even predict out-group love (see also Golec de Zavala et al., 2013a). Such in-group love is more likely when people have high self-esteem.

Corollary two of the self-esteem hypothesis may be valid only when individuals invest their self-esteem in their in-group's positive image and are not, at the same time, happy to be members of positively valued groups. Two suppression effects make it difficult to observe the relationships anticipated by corollary two of the self-esteem hypothesis directly: in-group satisfaction suppressing the negative link between self-esteem and collective narcissism, and

collective narcissism suppressing the negative link between in-group satisfaction and out-group derogation. Our research emphasizes the importance of in-group satisfaction in buffering the negative intergroup consequences of low self-esteem.

### **Relevance of In-Group Satisfaction**

Low self-esteem may motivate people to sustain collective-narcissist beliefs about their in-group and derogate out-groups. The longitudinal findings indicate that out-group derogation does not reliably improve self-esteem either directly or indirectly. However, as long as collective narcissism overlaps with in-group satisfaction, it is also indirectly linked to the psychological benefits of positive social identity: feeling socially connected, happy, and pro-social. Our research corroborates prior findings that, when the positive overlap between collective narcissism and in-group satisfaction is not partialled out, the association between collective narcissism and out-group derogation is weaker (Golec de Zavala et al., 2013a). In addition, collective narcissism is indirectly related to positive and prosocial emotions via in-group satisfaction (Golec de Zavala, 2019). This suggests that the positive overlap with in-group satisfaction mitigates collective narcissistic intergroup hostility. In the longer run, capitalizing on this overlap may offer a route to improving the negative emotionality that underlies collective narcissism towards stronger positivity and prosociality. Participating in positively valued in-groups may raise self-esteem following the logic of ‘upward going spiral’ characterizing positive emotionality: Positive emotions produce more positive emotions and strengthen the ability to effectively alleviate the influence of negative emotions and to maintain life satisfaction, even during hardship and adversity (Fredrickson, 2001). Thus, positive attitudes toward one’s in-group membership can buffer threats to and lift individual self-esteem. In consequence, it can also lower collective narcissism.

Conversely, situations that decrease the overlap between collective narcissism and in-group satisfaction are likely to make the indirect link between undermined self-esteem and out-group derogation or intergroup aggression via collective narcissism stronger. When collective narcissism becomes a normative narration about the in-group’s identity and the role of in-group satisfaction is marginalized (e.g., via centralization of power or detachment from local community), individuals who were made uncertain about their self-esteem are more

likely to turn against other groups like minorities, immigrants, or refugees, because they are motivated to protect the in-group in whose grandiosity their self-esteem is invested.

### **Self-Esteem, Out-Group Derogation, and Symbolic Aggression**

Although our results elucidate the elusive, negative link between self-esteem and out-group derogation, they also pose questions. First, the results suggest that the direct relationship between trait self-esteem and out-group derogation depends on the target out-group. In Study 3, after the indirect effects of collective narcissism and in-group satisfaction were taken into account, trait self-esteem was directly, negatively associated with prejudice towards Jews. However, in Study 4, this pattern did not emerge in reference to prejudice towards Syrian refugees. Thus, after the opposite mediating effects of the beliefs about the in-group were disentangled, low trait self-esteem directly motivated ‘normative’ prejudice (i.e., prejudice that is not proscribed by dominating social norms; Crendall, Eshelman, & O’Brien, 2002), but not ‘new’ prejudice that had not yet been linked to narration about national identity. In Poland, anti-Semitism is implicated in the nationalistic construal of national identity and may even be seen as normatively prescribed (Bilewicz, Winiewski & Radzik, 2012; Krzeminski, 2002). In contrast, Syrian refugees are a new out-group. Although they are generally disliked in Poland (Hall & Mikulska-Jolles, 2016), and national collective narcissism predicts rejection of refugees (Dyduch-Hazar et al., 2019), prejudice towards them may not be linked to construal of national identity. Future investigations would do well to examine how the normative content of social identity is implicated in the direct relationship between self-esteem and out-group derogation.

Our results additionally suggest that temporarily lowered state self-esteem directly predicts intergroup aggression even after mediation by collective narcissism and suppression by in-group satisfaction are taken into account. In Study 7, state self-esteem undermined by intergroup exclusion resulted in symbolic aggression towards the excluding out-group. In contrast, in Study 5, trait self-esteem was unrelated to symbolic aggression towards the target of prejudice after the indirect effects of collective narcissism was taken into account. Such results align with the proposition that threats to specific state self-esteem may motivate out-group derogation (Martiny & Rubin, 2016). However, the current results specify that threats

to specific state self-esteem motivate intergroup aggression. The direct, negative association between state self-esteem and aggression may be explained by a broader association of low self-esteem with aggressiveness reported in the literature (Donnellan et al., 2005; Locke, 2009; Paulhus et al., 2004). Future investigations should test whether the direct relationship with symbolic aggression is specific to state, rather than trait, self-esteem.

To the best of our knowledge, Studies 5 and 7 are the first that examined the links among self-esteem, collective narcissism, in-group satisfaction, and symbolic intergroup aggression. Although collective narcissism increased symbolic aggression just like it increased out-group derogation, in-group satisfaction did not reduce the association between self-esteem (trait or state) and symbolic aggression to the same extent that it reduced the association between self-esteem and out-group derogation. In-group satisfaction, then, is negatively related to out-group derogation, but is unrelated to intergroup aggression. Derogating out-groups and engaging in violence against them may be governed by distinct psychological processes, and collective narcissism may be involved in both of them.

### **Limitations**

Although our research generated compelling evidence in support of the hypotheses, it is not without limitations. Some of the obtained results are not consistent across all studies. As noted above, in Study 3 self-esteem was directly and negatively associated with out-group derogation, whereas in Study 4 it was not. In Study 5, trait self-esteem was not directly related to symbolic aggression, whereas in Study 7 lowered state self-esteem directly predicted symbolic aggression. Follow-up investigations should address those inconsistencies to better understand the relevance of self-esteem in intergroup processes beyond its indirect associations via collective narcissism and in-group satisfaction.

Another limitation may be linked to our estimation strategy in the two longitudinal studies (i.e., Studies 2 and 6). Traditional cross-lagged panel approaches have been criticized for accounting inadequately for trait-like stability in constructs, which may bias estimates of cross-lagged coefficients. To address this issue, Hamaker, Kuiper, and Grasman (2015) offered a “random-intercepts” variant of the cross-lagged panel model (the RI-CLPM). This model was not an option in Study 2, because the RI-CLPM requires at least three waves of



data. Given that Study 6 included four data waves, we attempted to estimate a RI-CLPM version of the Cole and Maxwell (2003) cross-lagged panel mediation model. However, the RI-CLPM is a complex model even in its simplest form, and it is often plagued by convergence issues or inadmissible solutions when expanded to include more than two constructs as well as lagged effects reaching across more than one wave (Osborne, Milojevic, & Sibley, 2017). Our version of the RI-CLPM featured this level of complexity, and we were unable to obtain an admissible solution as a result. This problem may be due to the complexity of the model relative to the effective sample size in the analyses ( $N = 410$ ; see Hamaker et al., 2015). Future investigations may wish to revisit the questions of Study 6 using a longitudinal study with a larger sample.

### Conclusions

Results of seven studies provided consistent support for both the seed proposal of the Frankfurt School and the status politics scholars' proposition that low self-esteem conduces to collective narcissism. Results of five studies also supported corollary two of the self-esteem hypothesis, namely, that low self-esteem conduces to out-group derogation. However, this effect was indirect, mediated by collective narcissism. In all, low and high self-esteem may motivate positive evaluation of the in-group, albeit in different ways (expressed as in-group satisfaction and collective narcissism), for different reasons, and with different consequences for attitudes and behavior towards out-groups. Individuals approach their in-group with divergent expectations depending on their self-esteem: Low self-esteem is uniquely related to collective narcissism, whereas high self-esteem is uniquely related to in-group satisfaction. Moreover, low self-esteem is related to out-group derogation and symbolic aggression uniquely via collective narcissism. In-group satisfaction suppressed the association between low self-esteem and collective narcissism, and between collective narcissism and out-group derogation. So, as long as collective narcissists are also satisfied and proud members of their groups, they are able to find other ways of achieving high self-esteem other than out-group derogation. Finally, the positive relationship between self-esteem and in-group satisfaction is reciprocal: High self-esteem conduces to more in-group satisfaction, and in-group satisfaction conduces to higher self-esteem.

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Table 1

*Testing Hypotheses 1 and 2 in Cross-Sectional Studies 1, 3, 4, and 5*

	Study 1		Study 3		Study 4		Study 5	
	Correlation with SE		Correlation with SE		Correlation with SE		Correlation with SE	
	Zero-order	Partial	Zero-order	Partial	Zero-order	Partial	Zero-order	Partial
CN	.01	-.16**	.01	-.19***	.01	-.18***	-.05	-.11*
IS	.29***	.33***	.27***	.33***	.26***	.31***	.20***	.20***
Intercorrelations	$r(427) = .48^{***}$		$r(506) = .60^{***}$		$r(1059) = .61^{***}$		$r(465) = .39^{***}$	
Regression Coefficients to Test Hypothesis 2								
SE – CN	-.18 (.06)**; $\beta = -.15$		-.20 (.05)**; $\beta = -.16$		-.20 (.03)**; $\beta = -.15$		-.36 (.14)**; $\beta = -.15$	
SE – IS	.36 (.05)**; $\beta = .29$		.34 (.04)**; $\beta = .27$		.32 (.03)**; $\beta = .24$		.69 (.16)**; $\beta = .25$	
CN – OD/SA	---		.26 (.08)**; $\beta = .19$		.24 (.05)**; $\beta = .20$		.93 (.25)**; $\beta = .91$	
IS – OD /SA	---		-.24 (.08)**; $\beta = -.17$		-.17 (.05)**; $\beta = -.14$		-.04 (.27); $\beta = -.05$	
Indirect Effects to Test Hypothesis 1 and 2								
SE–IS–CN	IE = .19(.04); CI95%[0.12;0.28]; $z = 5.54^{***}$		IE = .21(.04); CI95%[0.14;0.30] $z = 6.00^{***}$		IE = .22(.03); CI95%[0.16;0.29]; $z = 8.25^{***}$		IE = .23(.08); CI95%[0.08;0.39]; $z = 3.35^{***}$	
SE–CN–IS	IE = .004(.03); CI95%[-0.06;0.07]; $z = 0.14$		IE = .01(.04); CI95%[-0.07;0.09]; $z = 0.30$		IE = .01(.03); CI95%[-0.05;0.07]; $z = 1.65$		IE = -.06(.08); CI95%[-0.21;0.10]; $z = -0.85$	
SE–CN–OD/SA	---		IE = -.05(.02); CI95%[-0.12; -0.03]; $z = -2.66^{**}$		IE = -.05(.02); CI95%[-0.08;-0.03]; $z = 3.93^{***}$		IE = -.34(.18); CI95%[-0.65;-0.09]; $z = -1.99^*$	
SE–IS–OD/SA	---		IE = -.08(.03); CI95%[-0.14; -0.03] $z = -2.80^{***}$		IE = -.06(.02); CI95%[-0.08;-0.02] $z = 3.31^{***}$		IE = -.03(.19); CI95%[-0.32;0.32]; $z = -0.27$	

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ ; SE = Self-Esteem; CN = Collective Narcissism; IS = In-group Satisfaction; OD = Out-group derogation; SA = Symbolic Aggression. We conducted analyses for symbolic aggression (SA) by specifying a negative binomial distribution. In Study 5, we conducted analyses to test Hypothesis 1 controlling for condition and its interaction with self-esteem. We also carried out analyses to test Hypothesis 2 controlling for condition and its interaction with self-esteem (for path a), and additionally collective narcissism and in-group satisfaction (for path b).

Table 2

*Correlations Among Variables in Study 2 (N = 853)*

Variables	1.	2.	3.	4.	5.	6.
1. Self-esteem (T1)	---					
2. Self-esteem (T2)	.74***	---				
3. Collective narcissism (T1)	-.16***	-.16***	---			
4. Collective narcissism (T2)	-.18***	-.23***	.66***	---		
5. In-group satisfaction (T1)	.40***	.35***	-.52***	-.32***	---	
6. In-group satisfaction (T2)	.35***	.37***	-.23***	-.49***	.66***	---

*Note.* \*\*\*  $p < .001$ ; T = Time. All collective narcissism and in-group satisfaction measures are the residualized versions of the variables.



Table 3

*Estimates from Cross-Lagged Panel Analysis in Study 2 (N = 853)*

	<i>B</i>	<i>SE b</i>	$\beta$
<i>Predicting T2 Collective Narcissism (R<sup>2</sup> = .45):</i>			
Collective Narcissism (T1)	.76***	(.03)	.69
In-group Satisfaction (T1)	.09*	(.04)	.08
<b>Self-Esteem (T1)</b>	<b>-.10***</b>	<b>(.03)</b>	<b>-.10</b>
<i>Predicting T2 In-group Satisfaction (R<sup>2</sup> = .45):</i>			
Collective Narcissism (T1)	.14***	(.03)	.13
In-group Satisfaction (T1)	.69***	(.03)	.68
<b>Self-Esteem (T1)</b>	<b>.09***</b>	<b>(.02)</b>	<b>.10</b>
<i>Predicting T2 Self-Esteem (R<sup>2</sup> = .56):</i>			
<b>Collective Narcissism (T1)</b>	<b>-.01</b>	<b>(.03)</b>	<b>-.01</b>
<b>In-group Satisfaction (T1)</b>	<b>.06*</b>	<b>(.03)</b>	<b>.06</b>
Self-Esteem (T1)	.65***	(.02)	.72

*Note.* \*  $p < .05$ . \*\*\*  $p < .001$ ; T = Time. All collective narcissism and in-group satisfaction measures are residualized to remove variance shared with the other variable at the same time point.

Table 4

*Correlations Among Variables in Study 3 (N = 506)*

Variables	1.	2.	3.	4.	5.
1. Self-esteem	---				
2. Personal control	.61 <sup>***</sup>	---			
3. Collective narcissism	.01	.03	---		
4. In-group satisfaction	.27 <sup>***</sup>	.21 <sup>**</sup>	.60 <sup>***</sup>	---	
5. Out-group derogation	-.14 <sup>**</sup>	-.11 <sup>*</sup>	.08 <sup>+</sup>	-.09 <sup>*</sup>	---

*Note.* <sup>+</sup> $p = .06$ ; <sup>\*</sup> $p < .05$ ; <sup>\*\*</sup> $p < .01$ ; <sup>\*\*\*</sup> $p < .001$ .

Table 5

*Correlations Among Variables in Study 4 (N = 1059)*

Variables	1.	2.	3.	4.
1. Self-esteem	---			
2. Collective narcissism	.01	---		
3. In-group satisfaction	.26***	.61***	---	
4. Out-group derogation	.001*	.12***	-.01	---

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

Table 6

*Correlations Among Variables in Study 5 (N = 472)*

Variables	1.	2.	3.
1. Self-esteem	---		
2. Collective narcissism	-.05	---	
3. In-group satisfaction	.20***	.39***	---
4. Symbolic aggression	-.12**	.35***	.12**
5. Symbolic aggression (negative binomial distribution)	-56(.27)* $\chi^2(1, 470) = 4.30$	.71(.11)*** $\chi^2(1, 470) = 40.08$	31(.11)** $\chi^2(1, 470) = 7.59$

*Note.* \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . To ensure that correlations with symbolic aggression are not affected by its non-normal distribution, we repeated correlation analysis using negative binomial regression for each pair of variables. We present relevant results in row 5.

SELF-ESTEEM, COLLECTIVE NARCISSISM, INGROUP SATISFACTION

Table 7

*Correlations Among Variables in Study 6 (N = 410)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16
1. Out-group derogation (T1)	--														
2. Out-group derogation (T2)	.59***	--													
3. Out-group derogation (T3)	.68***	.66***	--												
4. Out-group derogation (T4)	.63***	.65***	.72***	--											
5. Collective narcissism (T1)	.38***	.35***	.30***	.36***	--										
6. Collective narcissism (T2)	.36***	.31***	.30***	.31***	.67***	--									
7. Collective narcissism (T3)	.42***	.38***	.36***	.40***	.73***	.74***	--								
8. Collective narcissism (T4)	.38***	.35***	.31***	.38***	.72***	.70***	.75***	--							
9. In-group satisfaction (T1)	-.08†	-.09†	-.06	-.16***	-.66***	-.43***	-.45***	-.39***	--						
10. In-group satisfaction (T2)	-.08†	-.03	-.06	-.12*	-.40***	-.71***	-.46***	-.39***	.69***	--					
11. In-group satisfaction (T3)	-.14**	-.11*	-.09†	-.19***	-.45***	-.51***	-.68***	-.45***	.73***	.73***	--				
12. In-group satisfaction (T4)	-.10*	-.11*	-.06	-.18***	-.43***	-.46***	-.46***	-.64***	.69***	.69***	.72***	--			
13. Self-esteem (T1)	-.01	-.01	-.01	-.06	-.14**	-.17***	-.18***	-.18***	.38***	.37***	.42***	.39***	--		
14. Self-esteem (T2)	.02	-.01	.002	-.06†	-.16***	-.24***	-.22***	-.22***	.36***	.39***	.41***	.40***	.80***	--	
15. Self-esteem (T3)	.02	.02	.04	-.03	-.15**	-.24***	-.24***	-.20***	.39***	.43***	.48***	.42***	.78***	.80***	--
16. Self-esteem (T4)	-.04	-.05	-.003	-.09†	-.17***	-.26***	-.21***	-.27***	.31***	.36***	.38***	.40***	.77***	.74***	.77***

*Note.* † $p < 0.10$ . \* $p < 0.05$ . \*\* $p < 0.01$ . \*\*\* $p < 0.001$ ; T = Time; All collective-narcissism and in-group-satisfaction measures are the residualized versions of the variables.

SELF-ESTEEM, COLLECTIVE NARCISSISM, INGROUP SATISFACTION

Table 8

*Structural Estimates from Cross-Lagged Panel Analysis in Study 6 (N = 410)*

	<i>b</i>	SE <i>b</i>	$\beta$
<i>Time 2 Outcomes:</i>			
Outgroup Derogation (T1) → Outgroup Derogation (T2)	.53***	(.05)	.51
Collective Narcissism (T1) → Outgroup Derogation (T2)	.36***	(.09)	.23
Ingroup Satisfaction (T1) → Outgroup Derogation (T2)	.17 <sup>†</sup>	(.09)	.11
Outgroup Derogation (T1) → Collective Narcissism (T2)	.07***	(.02)	.12
Collective Narcissism (T1) → Collective Narcissism (T2)	.58***	(.05)	.64
Ingroup Satisfaction (T1) → Collective Narcissism (T2)	.02	(.05)	.02
<b>Self-Esteem (T1) → Collective Narcissism (T2)</b>	<b>-.08*</b>	<b>(.03)</b>	<b>-.09</b>
Outgroup Derogation (T1) → Ingroup Satisfaction (T2)	-.05*	(.02)	-.08
Collective Narcissism (T1) → Ingroup Satisfaction (T2)	.11*	(.05)	.12
Ingroup Satisfaction (T1) → Ingroup Satisfaction (T2)	.66***	(.05)	.73
<b>Self-Esteem (T1) → Ingroup Satisfaction (T2)</b>	<b>.09**</b>	<b>(.03)</b>	<b>.11</b>
Collective Narcissism (T1) → Self-Esteem (T2)	-.02	(.05)	-.02
Ingroup Satisfaction (T1) → Self-Esteem (T2)	.07	(.05)	.05
Self-Esteem (T1) → Self-Esteem (T2)	.84***	(.04)	.77
<i>Time 3 Outcomes:</i>			
Outgroup Derogation (T2) → Outgroup Derogation (T3)	.59***	(.04)	.62
<b>Collective Narcissism (T2) → Outgroup Derogation (T3)</b>	<b>.25***</b>	<b>(.10)</b>	<b>.15</b>
<b>Ingroup Satisfaction (T2) → Outgroup Derogation (T3)</b>	<b>.09***</b>	<b>(.19)</b>	<b>.05</b>
Self-Esteem (T1) → Outgroup Derogation (T3)	.03	(.06)	.02
Outgroup Derogation (T2) → Collective Narcissism (T3)	.07**	(.02)	.10
Collective Narcissism (T2) → Collective Narcissism (T3)	1.12***	(.07)	.91
Ingroup Satisfaction (T2) → Collective Narcissism (T3)	.26***	(.07)	.21
<b>Self-Esteem (T2) → Collective Narcissism (T3)</b>	<b>-.08**</b>	<b>(.02)</b>	<b>-.09</b>
Outgroup Derogation (T2) → Ingroup Satisfaction (T3)	-.09***	(.02)	-.14
Collective Narcissism (T2) → Ingroup Satisfaction (T3)	.18***	(.06)	.16
Ingroup Satisfaction (T2) → Ingroup Satisfaction (T3)	.97***	(.07)	.86
<b>Self-Esteem (T2) → Ingroup Satisfaction (T3)</b>	<b>.10***</b>	<b>(.04)</b>	<b>.11</b>
Outgroup Derogation (T1) → Self-Esteem (T3)	-.01	(.02)	-.01
Collective Narcissism (T2) → Self-Esteem (T3)	.11*	(.06)	.09
Ingroup Satisfaction (T2) → Self-Esteem (T3)	.26***	(.06)	.21
Self-Esteem (T2) → Self-Esteem (T3)	.69***	(.03)	.74

SELF-ESTEEM, COLLECTIVE NARCISSISM, INGROUP SATISFACTION

*Time 4 Outcomes:*

Outgroup Derogation (T3) → Outgroup Derogation (T4)	.67 <sup>***</sup>	(.04)	.67
<b>Collective Narcissism (T3) → Outgroup Derogation (T4)</b>	<b>.18<sup>**</sup></b>	<b>(.07)</b>	<b>.13</b>
<b>Ingroup Satisfaction (T3) → Outgroup Derogation (T4)</b>	<b>-.06</b>	<b>(.08)</b>	<b>-.04</b>
Self-Esteem (T2) → Outgroup Derogation (T4)	-.01	(.05)	-.01
Outgroup Derogation (T3) → Collective Narcissism (T4)	-.01	(.03)	-.02
Collective Narcissism (T3) → Collective Narcissism (T4)	1.02 <sup>***</sup>	(.06)	.99
Ingroup Satisfaction (T3) → Collective Narcissism (T4)	.29 <sup>***</sup>	(.06)	.25
Self-Esteem (T3) → Collective Narcissism (T4)	-.08 <sup>*</sup>	(.04)	-.08
Outgroup Derogation (T3) → Ingroup Satisfaction (T4)	-.02	(.02)	-.04
Collective Narcissism (T3) → Ingroup Satisfaction (T4)	.09 <sup>†</sup>	(.05)	.11
Ingroup Satisfaction (T3) → Ingroup Satisfaction (T4)	.77 <sup>***</sup>	(.06)	.82
Self-Esteem (T3) → Ingroup Satisfaction (T4)	.05	(.05)	.06
Outgroup Derogation (T2) → Self-Esteem (T4)	-.03	(.02)	-.05
Collective Narcissism (T3) → Self-Esteem (T4)	-.0003	(.05)	-.0003
Ingroup Satisfaction (T3) → Self-Esteem (T4)	.002	(.05)	.002
Self-Esteem (T3) → Self-Esteem (T4)	.75 <sup>***</sup>	(.04)	.77

*Note.* <sup>†</sup> $p < 0.10$ ; <sup>\*</sup> $p < 0.05$ ; <sup>\*\*</sup> $p < 0.01$ ; <sup>\*\*\*</sup> $p < 0.001$ ; T = Time. Path estimates are from the model shown in Figure 2. We residualized all collective narcissism and in-group satisfaction measures to remove variance shared with the other group-attachment variable at the same time point. Bolded coefficients indicate estimates central to hypothesis tests.

SELF-ESTEEM, COLLECTIVE NARCISSISM, INGROUP SATISFACTION

Table 9

*Key Indirect Effects from Cross-Lagged Panel Analysis in Study 6 (N = 410)*

	Estimate	95% CI
<i>Self-Esteem to Outgroup Derogation via CN:</i>		
SE (T1) → CN (T2) → OD (T3) → OD (T4)	-.013	[-0.05, -0.0004]
SE (T1) → CN (T2) → CN (T3) → OD (T4)	-.016	[-0.04, -0.001]
SE (T1) → SE (T2) → CN (T3) → OD (T4)	-.012	[-0.04, -0.001]
Total	.041	[-0.10, -0.010]
<i>Self-Esteem to Out-group Derogation via IS:</i>		
SE (T1) → IS (T2) → OD (T3) → OD (T4)	.006	[-0.01, 0.03]
SE (T1) → IS (T2) → IS (T3) → OD (T4)	-.006	[-0.03, 0.01]
SE (T1) → SE (T2) → IS (T3) → OD (T4)	-.005	[-0.03, 0.01]
Total	-.005	[-0.04, 0.03]

*Note.* † $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . T = Time; SE = Self-Esteem; CN = Collective Narcissism; IS = In-group Satisfaction; OD = Out-group Derogation. We residualized all collective narcissism and in-group satisfaction measures to remove variance shared with the other group-attachment variable at the same time point. Estimates are based on the model shown in Figure 2.



SELF-ESTEEM, OUT-GROUP DEROGATION AND COLLECTIVE NARCISSISM

Table 10

*Means (and Standard Deviations) Corresponding to the Manipulation Check Measures of Each Condition in Study 7 (N = 253)*

Measure	Exclusion	Inclusion	F
1. What percentage of the time did your national team receive the ball?	20.30 (15.84)	40.10 (22.00)	57.00***
2. Personal exclusion	3.79 (1.33)	2.44 (1.45)	51.69***
3. Group exclusion	3.94 (1.20)	1.43 (.82)	333.54***
4. Self-esteem	2.54 (.78)	3.51 (.84)	76.01***
5. Symbolic aggression	11.84 (17.38)	4.64 (9.76)	9.71**
6. Collective narcissism	3.49 (1.73)	3.28 (1.50)	0.95, $p = .33$
7. In-group satisfaction	4.89 (1.65)	5.16 (1.49)	1.31, $p = .21$
8. Net collective narcissism	3.48 (0.12)	2.20 (0.11)	5.32*
9. Net in-group satisfaction	5.22 (0.11)	4.82 (0.12)	5.99*

*Note.* \*\*  $p < .01$ . \*\*\*  $p < .001$ . Rows 8 and 9 refer to residualized collective narcissism and in-group satisfaction. Those are adjusted means estimated from two univariate general linear models when in-group satisfaction and collective narcissism were used as covariates, respectively.

SELF-ESTEEM, OUT-GROUP DEROGATION AND COLLECTIVE NARCISSISM

Table 11

*Testing Hypotheses 1 and 2 in Study 7 (N = 253)*

Correlations	1.	2.
1. Collective narcissism	---	
2. In-group satisfaction	.63***	---
3. Symbolic aggression	.41***	.18***
4. Symbolic aggression (negative binomial)	.41*** (.09) $\chi^2(1, 220) = 26.20$	.20* (.09) $\chi^2(1, 220) = 5.14$
Regression Coefficients to Test Hypothesis 2		
Condition – CN	.39* (.17); $\beta = .24$	
Condition – IS	-.40* (.16); $\beta = -.25$	
CN – SA	.54*** (.14); $\beta = .90$	
IS – SA	-.08 (.14); $\beta = -.12$	
Indirect Effects to Test Hypothesis 1 and 2		
Condition –IS–CN	IE = -.18 (.14); CI95%[-0.45;0.10]	
Condition –CN–IS	IE = .13 (.14); CI95%[-0.13;0.41]	
Condition –CN–SA	IE = .21 (.11); CI95%[0.06;0.41]	
Condition –IS–SA	IE = .03 (.06); CI95%[-0.05, 0.16]	

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . To ensure that correlations with symbolic aggression are not affected by its non-normal distribution, we repeated the correlation analyses using negative binomial regression for each pair of variables. We present relevant results in row 4.

SELF-ESTEEM, OUT-GROUP DEROGATION AND COLLECTIVE NARCISSISM

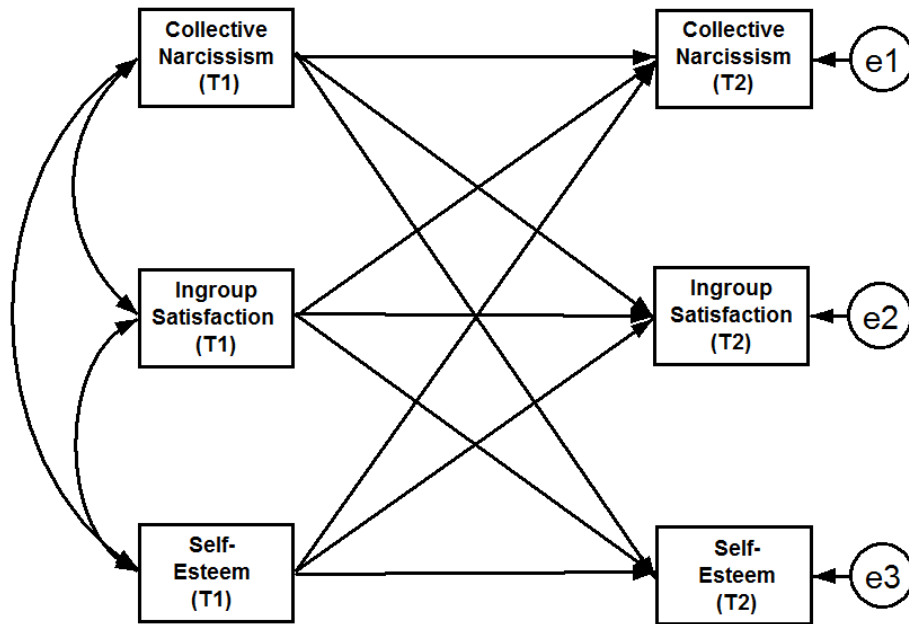
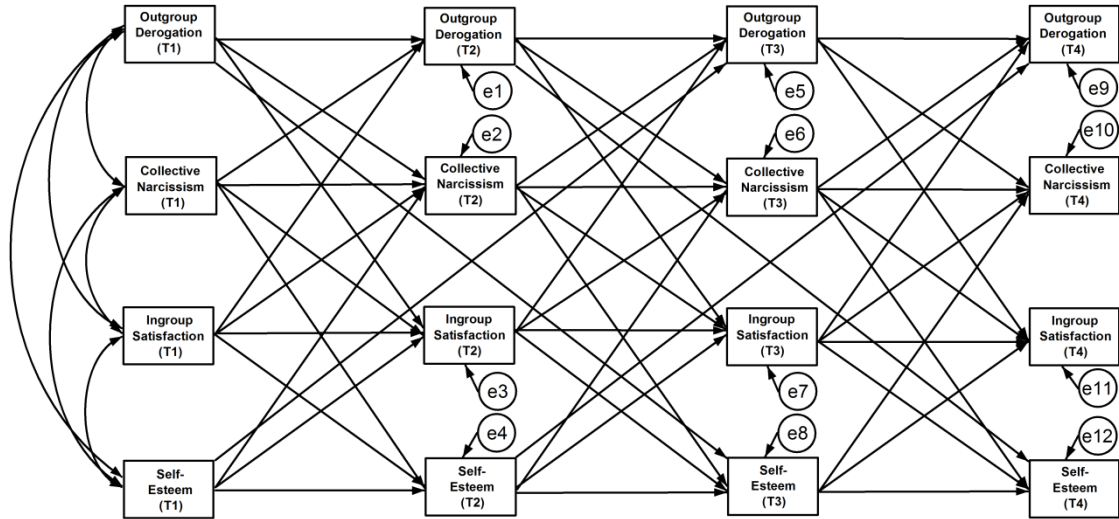


Figure 1. Cross-lagged panel model in Study 2. All T2 disturbances were allowed to correlate; correlations are not shown.

# SELF-ESTEEM, OUT-GROUP DEROGATION AND COLLECTIVE NARCISSISM



*Figure 2.* Cross-lagged panel model in Study 6. The four T2 disturbances are allowed to correlate with one another, and the four T3 disturbances were allowed to correlate with one another; correlations are not shown.