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Running head: COLLECTIVE NARCISSISM AND COVID-19 SOLIDARITY

Collective Narcissism, In-Group Satisfaction, and Solidarity in the Face of COVID-19

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Abstract

The present study explored the antecedents of solidarity amid the COVID-19 pandemic. Given that solidarity during mass emergencies involves the development of a social identity encompassing those facing a common fate, we examined how national *in-group satisfaction* (a belief that the national in-group and one's membership in it are of high value) versus national *collective narcissism* (a belief that the national in-group is exceptional and entitled to privileged treatment, but not sufficiently recognized by others) predicted solidarity with those affected by the pandemic in Poland. The results of cross-sectional and dynamic analyses from a panel study on a representative sample of Polish adults indicate that in-group satisfaction predicted greater COVID-19 solidarity, whereas collective narcissism predicted reduced COVID-19 solidarity.

Keywords: COVID-19, solidarity, collective narcissism, national in-group satisfaction

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"Across the European Union, countries, regions and cities are stretching out a helping hand to neighbours, helping those most in need. This is European solidarity in action," claims a recent document issued by the European Commission (European Commission, 2020). Indeed, the COVID-19 pandemic has inspired an outpouring of social solidarity, in the form of help for those in need and at risk, support for front-line workers caring for the sick, and wider sharing of resources and expertise (Broom, 2020; Butler, 2020; Chakelian, 2020). This illustrates that mass emergencies often produce an uptick in solidarity and pro-social behavior (Kaniasty & Norris, 1999; Solnit, 2009; Tierney et al, 2006). At the same time, panic shopping, protests against stay-at-home orders, xenophobia, and ostracism of health workers have also been observed during the pandemic (Gebrekidan, 2020; McKeever, 2020; Rácz, 2020), suggesting a failure of solidarity (Mawson, 2005).

What factors determine solidarity in face of COVID-19? Previous research indicates that solidarity during mass emergencies involves the development of a social identity encompassing those facing a common fate (Drury, 2018). Thus, pandemic solidarity may depend on the way people construct important social identities (Norris & Alegria, 2008). In this context, we test the proposition that positive social identity may not be conducive of solidarity when construed in terms of *collective narcissism:* a belief that the national in-group is exceptional and entitled to privileged treatment, but insufficiently recognized by others (Golec de Zavala, Cichocka, Eidelson, & Jayawickreme, 2009).

National identity is especially relevant to solidarity in the context of COVID-19. Research points to two distinct ways in which people construe national identity, with opposite consequences for solidarity with others. The dichotomy has been conceptualized in several ways (see Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950; Blank & Schmidt, 2003; de Figueiredo & Elkins, 2003; Druckman, 1994; Kosterman & Feshbach, 1989). In this article, we focus on the distinction between collective narcissism and a second kind of positive belief about the national in-group:

national *in-group satisfaction*, a belief that the national in-group is of high value (Leach et al., 2008).

These forms of national identity may have different implications for solidarity with others. Prior

research suggests that in-group satisfaction is related to in-group solidarity and concern for national

welfare, whereas collective narcissism reflects an exaggerated concern about national image that

serves predominantly to satisfy individual needs for self-worth (Golec de Zavala & Keenan, 2020)

and has little to do with concern about others (Golec de Zavala, Dyduch-Hazar & Lantos, 2019;

Golec de Zavala & Lantos, 2020). On this basis, we expect that national in-group satisfaction will

predict greater solidarity in the face of the COVID-19 pandemic, whereas national collective

narcissism should predict lower solidarity.

Collective narcissism, in-group satisfaction, and group solidarity in face of mass emergency

Research suggests that collective narcissism may be negatively associated with concern for

the welfare of in-group members. First, research on narcissism as a personality variable emphasizes

the low communality and empathy displayed by narcissists (Hepper, Hart & Sedikides, 2014;

Campbell & Miller, 2011). In particular, collective narcissism is negatively associated with social

connectedness and when the positive correlation between collective narcissism and in-group

satisfaction is accounted for, it is *negatively* associated with gratitude and other prosocial emotions

(Golec de Zavala, 2019). Although collective narcissism is positively associated with a *general*

tendency to value group loyalty (Golec de Zavala & Federico, 2020), it does not have an

independent relationship with specific forms of loyalty to the nation once in-group satisfaction is

adjusted for. For example, controlling for in-group satisfaction, collective narcissism is *positively*

related to willingness to leave the country for good if paid better elsewhere (Marchlewska, Cichocka,

Jaworska, Golec de Zavala & Bilewicz, 2020).

In addition, collective narcissism is associated with outgroup hostility (Golec de Zavala &

Lantos, 2020), especially in response to actual (Golec de Zavala, Cichocka & Iskra-Golec, 2013;

Jasko et al., 2019) and imagined (Golec de Zavala, Guerra, Peker & Baran, 2016) threats to the in-group's image. When in-groupers are believed to 'contaminate' the in-group's image, they are also targeted. In this vein, collective narcissism is associated with rejection of vilified minorities (Golec de Zavala & Cichocka, 2012; Golec de Zavala, Cichocka & Bilewicz, 2013), immigrants (Golec de Zavala, Guerra & Simao, 2017), and sexual minorities (Mole, Golec de Zavala & Adraq, 2020; see also Golec de Zavala & Bierwiaczonek, 2020).[1]

These findings suggest that attention to differences between collective narcissism and other forms of in-group affinity may qualify existing accounts of the relationship between social identification and solidarity. For example, the hierarchical multicomponent model of social identification (Leach et al., 2008) posits that a belief in the in-group's high value should be positively associated with solidarity. However, we argue that this is only true when the value of the in-group is not exaggerated to boost self-image, as it is in collective narcissism (Golec de Zavala, Federico, et al., 2019; Jaworska, 2016). This suggests that self-image enhancement—rather than genuine concern for in-group members—may be the primary way social identity is consequential for collective narcissists. We propose that collective narcissism, unlike in-group satisfaction, may therefore be negatively associated with in-group solidarity, especially in the face of emergencies that require sacrifice for the sake of the community.

Indeed, since collective narcissism was first differentiated from other positive in-group beliefs, findings have indicated that non-narcissistic forms of in-group positivity have very different relationships with pro-social attitudes and behavior (Golec de Zavala, 2011; Golec de Zavala et al., 2019). In particular, in-group satisfaction has been the key comparison construct in research on

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[1] National collective narcissism has some overlap with nationalism (Blank & Schmidt, 2003). However, whereas nationalism reflects an offensive stance, collective narcissism reflects vulnerability and defensiveness (Golec de Zavala et al 2019). Nationalists use aggression to dominate others, collective narcissists use aggression to protect the in-group's image that they see as threatened. Though related, they are distinct (Federico & Golec de Zavala, 2020).

collective narcissism because it centers specifically on happiness with national identity itself, apart from feelings about national symbols (e.g., patriotism; Kosterman & Feshbach, 1989) or strength of identification with the national in-group (which pertains to *closeness* to the in-group versus how one evaluates it; Huddy & Khatib, 2007). It also taps positivity without concern that others insufficiently appreciate the in-group's greatness (Golec de Zavala et al., 2009). In-group satisfaction is not characterized by the focus on in-group image that is crucial to collective narcissism. Instead, it taps secure in-group positivity, which is associated with the belief that that individuals should use their positive characteristics to help their in-groups (Amiot & Sansfaçon, 2011; Legault & Amiot, 2014). When the variance it shares with collective narcissism is partialled out, in-group satisfaction does not predict hypersensitivity to in-group image threats (Golec de Zavala et al., 2016) or out-group hostility (Golec de Zavala & Cichocka, 2012; Dyduch-Hazar, Mrozinski, & Golec de Zavala, 2019; Golec de Zavala et al., 2019). Moreover, in-group satisfaction is associated with high self-esteem, positive emotionality, life satisfaction, prosociality, and social connectedness (Amiot & Aubin, 2013; Golec de Zavala, 2019). Given such findings, we expected that national in-group satisfaction would be associated with greater solidarity in the face of COVID-19, controlling for collective narcissism.

Overview

In this study, we examine national collective narcissism and in-group satisfaction as antecedents of solidarity in face the COVID-19 pandemic. Our analyses rely mainly on data from four waves of a panel study of Polish adults collected from 27 March to 18 May 2020. We test the following hypothesis: collective narcissism will be *negatively* related to COVID-19 solidarity adjusting for in-group satisfaction, whereas in-group satisfaction will be *positively* associated with solidarity adjusting for collective narcissism. We test this hypothesis in two ways. First, we estimate cross-sectional regressions predicting solidarity using collective narcissism and in-group satisfaction within waves. We also demonstrate that these relationships hold up using alternate estimation methods and

after accounting for covariates like moral foundations and individual narcissism. Second, we examine dynamic relationships between the variables across waves. We perform two analyses, one that examines combined *between-person* (e.g., whether in-group satisfaction predicts changes in the rank order of solidarity scores between individuals) and *within-person* (e.g., whether in-group satisfaction predicts changes in individuals' solidarity scores after accounting for trait-like stability in all variables) dynamic effects and one which specifically isolates within-person effects.

In the dynamic analyses, we also attend to the timeline of the COVID-19 pandemic in Poland. The first cases in Poland were reported on 4 March 2020, with the first reported death on 12 March. Around the same time, between 9-13 March, there was a sharp increase in coronavirus coverage in traditional and social media (Nowy Marketing, 2020). New cases increased most over the remainder of March, with a leveling-off thereafter (Worldometers, 2020). The government response followed a similar pattern, with the main increase in public-health restrictions occurring in March, followed by loosening in mid-April (Krakovsky, 2020). From 10-15 March, initial restrictions were implemented, including closures of schools, businesses, and cultural institutions, border controls, and prohibitions on public gatherings. An epidemic was declared on 20 March, and controls were tightened further (including a stay-at-home order) between 24-31 March. Officials announced relaxation of restrictions on 16 April, with the lockdown exit beginning on 20 April. Thus, given that the pandemic and the response to it intensified most in the second half of March, we expect our hypothesized relationships to be most evident in the earlier waves of our data (from late March and early April).

Method

Data

Our data come from a six-wave panel study of Polish adults collected online though the Ariadna Research Panel using a computer-assisted web interviewing (CAWI) method that presented

the respondent with the questionnaire and instructed them to respond online. All surveys were

conducted in Polish. *Wave 1* reached a representative sample of 1,060 Polish adults (568 women, 492

men) ranging in age from 18 to 94 years (*M*=45.09, *SD*=16.00) between 28 February 2020 and 4

March 2020. Age, gender, town were selected to reflect the population of Polish adults over 18 years

old. Five additional waves of data were collected via recontacts of these respondents (*Wave 2* from

13 to 18 March 2020, *Wave 3* from 27 March 2020 to 1 April 2020, *Wave 4* from 10 to 15 April 2020,

Wave 5 from 24 to 30 April 2020, and *Wave 6* from 8 May to 18 May 2020). The study was omnibus

in nature and broadly aimed at tracking public opinion during the 2020 Polish presidential election.

It was not fielded solely for the present study, and it included variables pertaining to hypotheses

other than the one examined here.[2]

Our primary analyses use Waves 3 (*N*=889), 4 (*N*=826), 5 (*N*=808), and 6 (*N*=785), which

included the solidarity measure. To estimate the power afforded by these sample sizes, we used the

`power pcorr` function in Stata 15 (StataCorp, 2017) to determine the estimated squared partial

correlation for a single coefficient that can be detected in a regression with four covariates for

α=0.05 and power=0.8 at *N*=889 and *N*=785.[3] These values were 0.0088 and 0.0099, respectively.[4]

Measures

Unless otherwise indicated, responses were given on a 11-point scale (0 = *I do not agree at all*,

10 = *I completely agree*). All variables were recoded to run from 0 to 1 before scales were created; the

descriptives below use the 0-1 recodings. Translations of all measures can be found in the

Supplemental Materials.

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[2] Given that the pandemic did not fully unfold until the study was already underway, the solidarity
items were not added until the third wave. Further detail on other measures included in the survey
can be found in the Supplemental Materials.
[3] These parameters correspond to the specification of the regression model in Table 2.
[4] Data can be found at https://osf.io/az4fc/?view_only=276c7d44ed994504a7d42508ca20723a.

Collective narcissism. This was assessed using the five-item Collective Narcissism Scale (Golec de Zavala et al., 2013). An example item is: "I will never be satisfied until Poland gets the recognition it deserves." Scores were averaged to form a scale in each wave. Higher scores indicate higher collective narcissism (Wave 3: α=0.92, *M*=0.49, *SD*=0.26; Wave 4: α=0.92, *M*=0.47, *SD*=0.25; Wave 5: α=0.92, *M*=0.47, *SD*=0.26; Wave 6: α=0.93, *M*=0.46, *SD*=0.26).

In-group satisfaction. This was measured using four items (Leach et al. 2008). An example is: "I am glad to be Polish." Item responses were averaged to form a scale in each wave, and higher scores indicate greater ingroup satisfaction (Wave 3: α=0.94, *M*=0.69, *SD*=0.23; Wave 4: α=0.94, *M*=0.68, *SD*=0.24; Wave 5: α=0.95, *M*=0.67, *SD*=0.24; Wave 6: α=0.95, *M*=0.67, *SD*=0.25).[5]

COVID-19 solidarity. Solidarity with others during the COVID-19 pandemic was assessed with six items. Examples include: "I have a feeling of solidarity with those who may be infected by coronavirus" and "I feel connected to others in the fight against the spread of the virus." Scores were averaged to form a scale in each wave; higher scores indicate greater solidarity (Wave 3: α=0.93, *M*=0.77, *SD*=0.19; Wave 4: α=0.92, *M*=0.76, *SD*=0.19; Wave 5: α=0.94, *M*=0.74, *SD*=0.20; Wave 6: α=0.93, *M*=0.72, *SD*=0.21).

Demographic covariates. These included: a dummy variable indicating *male* gender (1 = yes, 0 = no), *education* (six ordered categories, recoded to run from 0 to 1), *age* (in years). These measures were included as standard demographic controls.

Results

Bivariate Relationships

Bivariate correlations between the key variables are summarized in Table 1. Each construct was relatively stable across waves (*r*s>0.70; *p*s<0.001). Moreover, within each wave, in-group

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[5] In the Supplemental Materials, we report confirmatory factor analyses indicating that a two-factor structure best fits the collective-narcissism and ingroup-satisfaction items in each wave.

satisfaction was correlated with solidarity (ps<0.001). The bivariate correlations between collective

narcissism and solidarity were also positive but small (all rs=0.11 or below). This result is consistent

with prior research (Golec de Zavala, 2019) suggesting that collective narcissism is unrelated or

weakly positively related to prosocial outcome variables absent any correction for variance shared

with in-group satisfaction.

Table 1. Pairwise Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11
1. COVID-19 Solidarity (W3)	1.00										
2. Collective Narcissism (W3)	0.05	1.00									
3. In-group Satisfaction (W3)	0.46***	0.56***	1.00								
4. COVID-19 Solidarity (W4)	0.76***	0.04	0.45***	1.00							
5. Collective Narcissism (W4)	0.04	0.85***	0.53***	0.09*	1.00						
6. In-group Satisfaction (W4)	0.42***	0.50***	0.85***	0.49***	0.56***	1.00					
7. COVID-19 Solidarity (W5)	0.75***	0.06	0.42***	0.80***	0.09*	0.43***	1.00				
8. Collective Narcissism (W5)	0.03	0.85***	0.49***	0.04	0.87***	0.50***	0.08†	1.00			
9. In-group Satisfaction (W5)	0.42***	0.52***	0.83***	0.46***	0.54***	0.87***	0.45***	0.56***	1.00		
10. COVID-19 Solidarity (W6)	0.72***	0.09*	0.41***	0.77***	0.09*	0.43***	0.80***	0.08*	0.42***	1.00	
11. Collective Narcissism (W6)	0.03	0.83***	0.52***	0.04***	0.85***	0.52***	0.06	0.87***	0.54***	0.11**	1.00
12. In-group Satisfaction (W6)	0.38***	0.47***	0.81***	0.43***	0.53***	0.85***	0.41***	0.50***	0.85***	0.43***	0.58***

Note. All entries are Pearson correlations. N=667 for correlations involving all waves (†p<.10. *p<.05. **p<.01. ***p<.001.)

Predictors of COVID-19 Solidarity: Cross-Sectional Analysis

We began by carrying out a cross-sectional examination of the relationships between collective narcissism (CN) and in-group satisfaction (IS) and solidarity with those afflicted by COVID-19. We regressed Wave 3 solidarity on Wave 3 CN and IS using ordinary least-squares. The model also included male gender, education, and age as covariates to control for variation in solidarity due to standard demographic characteristics.[6] HC3 robust standard errors were used (Long & Ervin, 2000). These estimates are summarized in Table 2, and the relationships between CN and IS and solidarity in each wave are plotted in Figure 1. Consistent with our hypothesis, ingroup satisfaction was *positively* related to COVID-19 solidarity, controlling for CN (Wave 3: b=0.44, β=0.53, p<0.001). Given the 0-1 variable codings, the unstandardized coefficients indicate that going from the minimum to the maximum value of IS is associated with a 44% increase in solidarity in Waves 3 (Baguley, 2009). Also consistent with our hypothesis, CN was *negatively* associated with COVID-19 solidarity (b=-0.15, β=-0.19, p<0.001), once variance shared with IS was accounted for. As such, moving from the minimum to the maximum value of CN is associated with a 15% decrease in solidarity.

Thus, as predicted, only IS remains positively related to solidarity once the variance its shares with CN is accounted for. In contrast, CN becomes negatively related to solidarity once its overlap with IS is removed. We performed the same analysis in Waves 4-6 and obtained virtually identical results, suggesting a largely-consistent pattern of cross-sectional relationships. We report these results in the Supplemental Materials.

Robustness checks. In the Supplemental Materials, we provide robustness checks on these cross-sectional results. First, we estimate cross-sectional models that include measures of Graham,

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[6] All covariates were assessed in Wave 1. The estimates for IS and CN were similar when the covariates were excluded: b=0.50 (95% CI: 0.44, 0.57), β=0.60, p<0.001, for IS; and b=-0.21 (95% CI: -0.26, -0.17), β=-0.28, p<0.001, for CN.

Haidt, and Nosek's (2009) moral foundations. The results of these models are substantively similar, though we find that the relationships between IS and solidarity are somewhat weaker once moral foundations are accounted for. Second, we estimate cross-sectional models with individual-level narcissism (Crocker & Park, 2004; Morf, & Rhodewalt, 2001; Rhodewalt & Sorrow, 2003) included as a covariate, given that individual narcissism correlates with CN and may predict selfish behavior and low solidarity apart from CN (Marchlewska et al., 2020). These models produced results substantively similar to those in Table 2. Third, to address endogeneity, we re-estimated the main cross-sectional models using two-stage least squares, with measures of IS and CN from Waves 1 and 2 as instruments for IS and CN in Waves 3-6 (Wooldridge, 2013). These models produced results similar to the ordinary least-squares estimates.

Table 2. COVID-19 Solidarity as a Function of Collective Narcissism and Ingroup Satisfaction in Wave 3 (Cross-Sectional Estimates)

	Wave 3		
Predictor	*b*	95% CI	*P*
Male	-0.05	[-0.03, -0.07]	<0.001
Education	0.02	[-0.01, 0.06]	0.174
Age	0.003	[0.002, 0.004]	<0.001
Collective Narcissism	-0.15	[-0.19, -0.10]	<0.001
Ingroup Satisfaction	0.44	[0.37, 0.50]	<0.001
Intercept	0.41	[0.35, 0.46]	<0.001
F (degrees of freedom)	109.29 (5, 883), *p*<0.001		
R²	0.335		
N	889		

Note. Entries are ordinary least-squares regression coefficients and HC3 robust standard errors.

Wave 3 Estimates
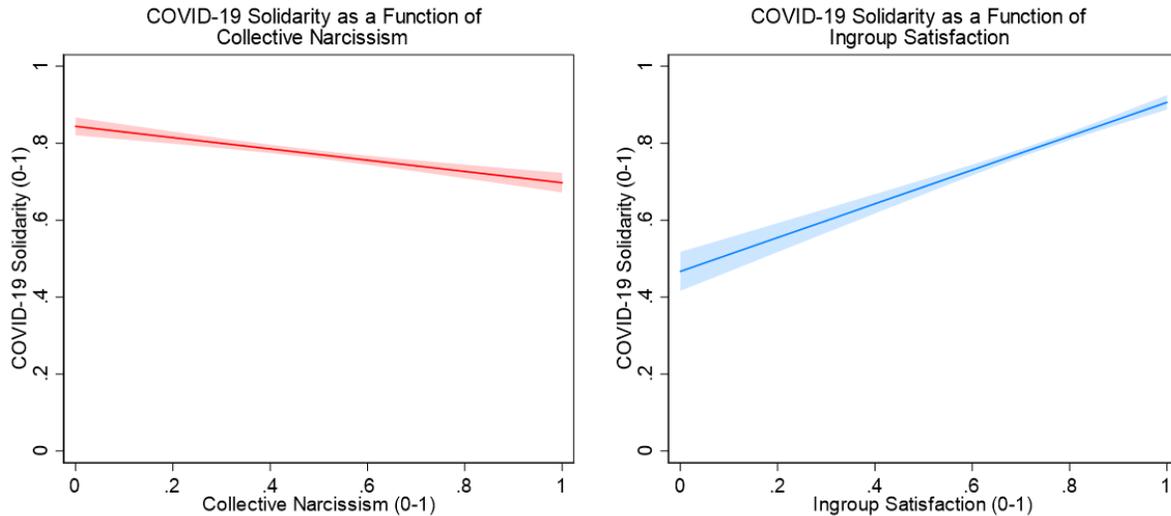
Figure 1. COVID-19 solidarity as a function of collective narcissism and ingroup satisfaction: Cross-sectional estimates for Wave 3. The error bands indicate 95% CIs around the predictions. Predicted values based on estimates in Table 2.

Dynamic Models of In-group Satisfaction, Collective Narcissism, and COVID-19 Solidarity

The above analyses examine the relationships between our study variables at single points in time. To expand on these findings, we examined our hypothesis from a dynamic perspective to see whether IS and CN predicted *changes* in solidarity over time. Using the measures of IS, CN, and COVID-19 solidarity from Waves 3-6, we estimated two dynamic models: a traditional cross-lagged panel model (CLPM) and a random-intercept cross-lagged panel model (RI-CLPM; Hamaker, Kuiper, & Grasman, 2015). These models allow us to examine dynamic relations between variables in two ways. The CLPM tracks total change in the study variables, consisting of change *between persons* (relative to sample means) as a function of other variables *and* change *within persons* relative to their stable level of each construct. The RI-CLPM specifically isolates within-person change by adding random intercepts for each variable to the CLPM to account for stable individual differences.

A conceptual diagram of the CLPM and RI-CLPM is shown in Figure 2. [7] To estimate both models in the same framework, each variable in each time period was entered as a latent variable with its observed value as a single indicator with its loading fixed to 1 and its residual variance fixed to 0. Both models share the following: (1) in Waves 4-6, each construct in that wave was regressed on all three constructs in the prior wave; (2) the disturbances for the constructs in Waves 4-6 were all allowed to correlate within each wave; and (3) the Wave 3 measures of the constructs were also allowed to correlate. The RI-CLPM adds a random intercept for each construct in the form of a latent variable with the measures of the construct at the four waves serving as its indicators; the loadings are fixed to 1. The random intercepts were allowed to correlate, and each is equivalent to a person's average construct level over all waves. Importantly, the CLPM is nested within the RI-CLPM, and can be obtained by fixing the variances and covariances of the random intercepts to 0. All models estimated in R (version 3.6.3) with the `lavaan` package (version 0.6-5) using maximum likelihood with the Satorra-Bentler correction for non-normality (MLM; Rosseel, 2012; Satorra & Bentler, 1994). The models used only those respondents who provided complete data on all measures in all waves (N=667).

Estimates for both models are summarized in Table 3. The CLPM provided an adequate fit according to the CFI and SRMR (CFI=0.93, SRMR=0.05) but not the RMSEA (0.16), with $\chi^2(27)$=492.31, p<0.001. The auto-regressive parameters indicate that the three variables were stable over time between persons (all βs>0.65, ps<0.001). As expected, the predicted total dynamic effects of IS and CN on total variability in solidarity were strongest between Waves 3 and 4, when the coronavirus crisis was ramping up. Wave 3 IS was associated with higher levels of Wave 4 solidarity, adjusting for Wave 3 solidarity and CN (β=0.19, p<0.001). Wave 3 CN was associated with lower

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[7] Panel attrition was not associated with any of the three main variables. Details can be found in the Supplemental Materials.

levels of Wave 4 solidarity, controlling for Wave 3 solidarity and IS (β=-0.10, p=0.002). In contrast, the reverse paths from Wave 3 solidarity to Wave 4 IS (β=0.05, p=0.053) and CN (β=-0.04, p=0.077) were smaller in magnitude. The dynamic effects of IS and CN on total variability in solidarity between Waves 4 and 5 (IS, β=0.06; CN, β=-0.02) and between Waves 5 and 6 (IS, β=0.09; CN, β=-0.03) were weaker, as expected given the timeline of events in Poland.[8] Nevertheless, the dynamic effects of IS were marginal or significant across both periods. Interestingly, though not predicted, we find reverse effects of solidarity on total variability in IS and CN across these periods that are consistent in sign with expectations. For example, Wave 4 solidarity predicted greater Wave 5 IS (β=0.07, p=0.008) and reduced Wave 5 CN (β=-0.08, p=0.001).

As noted above, the CLPM does not specifically capture changes over time within individuals, since it does not account for trait-like stability in variables. Rather, it reveals changes in the rank ordering of individuals in solidarity within the sample as a function of how individuals score on IS and CN relative to the sample means of the latter (or vice versa) plus within-person change. To examine within-person dynamics, we turn to the RI-CLPM estimates in Table 3. The RI-CLPM provided a good fit (CFI=1.00, RMSEA=0.04, SRMR=0.02), with χ^2(21)=40.13, p=0.007. In contrast to the CLPM, the RI-CLPM reveals little evidence of within-person dynamic effects. IS and CN do not predict changes in solidarity within individuals across waves (ps>0.250 from Wave 3 to 4 and Wave 5 to 6; ps>0.10), and solidarity does not predict changes in IS and CN within individuals (ps>0.250 across all wave transitions). However, the random intercepts—representing between-persons variation in each construct—were correlated in the expected fashion. Between-persons IS was highly correlated with between-persons solidarity (φ=0.53, p<0.001), whereas between-persons

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[8] Consistent with idea that solidarity would be most dynamic during the late-March period between Waves 3 and 4, between-person stability in solidarity was lower between Waves 3 and 4 (β=0.68) than Waves 4 and 5 (β=0.78) and Waves 5 and 6 (β=0.76).

CN was not ($\varphi=0.07$, $p=0.136$).[9] Constraining these correlations to equality reduced model fit, suggesting a stronger relation between IS and solidarity than CN and solidarity, $\Delta\chi^2(1)=207.94$, $p<0.001$.

Thus, whereas the CLPM estimates provide support for the predicted over-time effects with respect to combined between-person and within-person changes, the RI-CLPM does not suggest statistically reliable within-person effects once trait-like stability variability stability is modeled.

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[9] The random intercepts for CN and IS were also positively correlated ($\varphi=0.61$, $p<0.001$).

Table 3. CLPM and RI-CLPM Estimates, Waves 3 through 6

	CLPM Estimates (Between + Within)				RI-CLPM Estimates (Within Only)			
	b	95% CI	β	p	b	95% CI	β	p
W4 Solidarity								
Solidarity (W3)	0.69	[0.63, 0.75]	0.68	<0.001	-0.16	[-0.33, 0.01]	-0.19	0.071
Collective Narcissism (W3)	-0.08	[-0.12, -0.03]	-0.10	<0.001	-0.09	[-0.25, 0.08]	-0.11	>0.250
In-group Satisfaction (W3)	0.16	[0.11, 0.22]	0.19	<0.001	0.07	[-0.12, 0.25]	0.08	>0.250
W4 Collective Narcissism								
Solidarity (W3)	-0.05	[-0.11, 0.01]	-0.04	0.077	-0.01	[-0.19, 0.17]	-0.01	>0.250
Collective Narcissism (W3)	0.78	[0.73, 0.83]	0.80	<0.001	-0.03	[-0.24, 0.18]	-0.04	>0.250
In-group Satisfaction (W3)	0.11	[0.05, 0.18]	0.10	<0.001	-0.08	[-0.28, 0.12]	-0.09	>0.250
W5 In-group Satisfaction								
Solidarity (W3)	0.06	[-0.001, 0.12]	0.05	0.053	-0.06	[-0.25, 0.13]	-0.07	>0.250
Collective Narcissism (W3)	0.85	[0.01, 0.10]	0.05	0.025	0.01	[-0.17, 0.19]	0.01	>0.250
In-group Satisfaction (W3)	0.82	[0.76, 0.88]	0.80	<0.001	-0.02	[-0.25, 0.20]	-0.03	>0.250
W5 Solidarity								
Solidarity (W4)	0.80	[0.74, 0.86]	0.78	<0.001	0.03	[-0.24, 0.30]	0.03	>0.250
Collective Narcissism (W4)	-0.02	[-0.07, 0.03]	-0.02	>0.250	0.14	[-0.08, 0.36]	0.13	0.105
In-group Satisfaction (W4)	0.05	[-0.01, 0.11]	0.06	0.088	-0.14	[-0.35, 0.06]	-0.12	0.176
W5 Collective Narcissism								
Solidarity (W4)	-0.11	[-0.17, -0.05]	-0.08	0.001	-0.04	[-0.23, 0.15]	-0.03	>0.250
Collective Narcissism (W4)	0.86	[0.81, 0.90]	0.83	<0.001	0.08	[-0.14, 0.30]	0.07	>0.250
In-group Satisfaction (W4)	0.09	[0.03, 0.15]	0.08	0.003	0.11	[-0.08, 0.29]	0.09	0.250
W5 In-group Satisfaction								
Solidarity (W4)	0.08	[0.03, 0.15]	0.07	0.008	0.04	[-0.16, 0.24]	0.03	>0.250
Collective Narcissism (W4)	0.09	[0.05, 0.13]	0.10	<0.001	-0.12	[-0.32, 0.09]	-0.11	>0.250

In-group Satisfaction (W4)	0.79	[0.73, 0.84]	0.79	<0.001	0.20	[0.02, 0.38]	0.17	0.034
W6 Solidarity								
Solidarity (W5)	0.78	[0.71, 0.85]	0.76	<0.001	0.31	[0.12, 0.49]	0.27	0.001
Collective Narcissism (W5)	-0.02	[-0.06, 0.02]	-0.03	>0.250	0.06	[-0.08, 0.19]	0.05	>0.250
In-group Satisfaction (W5)	0.08	[0.02, 0.14]	0.09	0.010	-0.05	[-0.20, 0.09]	-0.05	>0.250
W6 Collective Narcissism								
Solidarity (W5)	-0.07	[-0.12, -0.02]	-0.05	0.010	0.02	[-0.14, 0.18]	0.02	>0.250
Collective Narcissism (W5)	0.81	[0.75, 0.85]	0.80	<0.001	0.20	[0.04, 0.37]	0.19	0.017
In-group Satisfaction (W5)	0.12	[0.06, 0.18]	0.11	<0.001	0.02	[-0.14, 0.18]	0.02	>0.250
W6 In-group Satisfaction								
Solidarity (W5)	0.04	[-0.01, 0.10]	0.04	0.136	-0.03	[-0.19, 0.13]	-0.02	>0.250
Collective Narcissism (W5)	0.04	[-0.01, 0.08]	0.04	0.106	0.10	[-0.05, 0.25]	0.09	0.193
In-group Satisfaction (W5)	0.85	[0.79, 0.91]	0.91	<0.001	0.23	[0.04, 0.41]	0.20	0.016
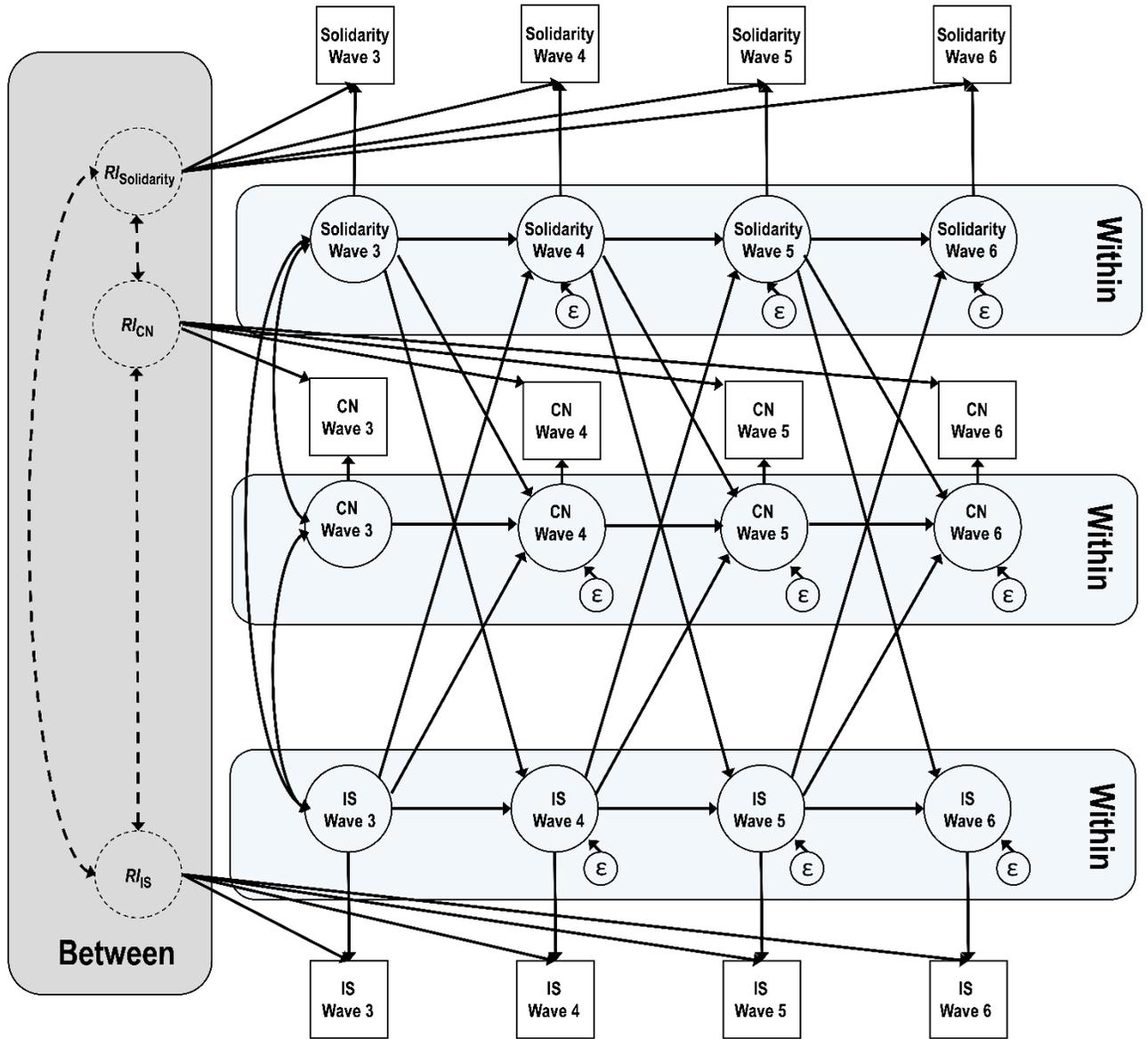
Figure 2. Conceptual diagram of cross-lagged panel (CLPM) and random-intercept cross-lagged panel

(RI-CLPM) models of the relationships between CN, IS, and COVID-19 solidarity. When the

variances and covariances shown with dotted lines are fixed to 0, the diagram represents the CLPM;

when they are freely estimated, the diagram represents the RI-CLPM. Disturbances within each of

Waves 4-6 are allowed to correlate; paths are not shown for visual clarity.

Discussion

The goal of the present study was to explore how two positive beliefs about one's nation relate to solidarity in the face of the COVID-19 pandemic: *in-group satisfaction* and *collective narcissism*. In-group satisfaction reflects a tendency to highly value the national in-group, but collective narcissism represents a belief that one's nation is extraordinary but insufficiently appreciated by others—a belief motivated by desires for self-importance (Golec de Zavala & Lantos, 2020). With this in mind, we hypothesized that in-group satisfaction (controlling for collective narcissism) would be positively associated with solidarity in the face of COVID-19, and that collective narcissism (adjusting for in-group satisfaction) would be negatively associated with such solidarity.

Using a representative panel study of Polish adults, we found support for this hypothesis. First, in cross-sectional regressions, in-group satisfaction had the expected positive relationship with solidarity (controlling for collective narcissism) and collective narcissism had the expected negative relationship with solidarity (controlling for in-group satisfaction) in all waves. This result held up in a variety of robustness checks. Second, in dynamic analyses, we found evidence that in-group satisfaction and collective narcissism predicted parallel overall changes in solidarity. These effects were strongest during the late-March period when the pandemic intensified most in Poland. Data from later waves also suggested reverse effects consistent in sign with expectations, such that solidarity was associated with increases in in-group satisfaction and decreases in collective narcissism. However, effects were not found specifically at the within-person level once trait-like stability in the study variables was accounted for using a random-intercept cross-lagged panel model. Together, these results indirectly suggest that changes in solidarity as a function of in-group satisfaction and collective narcissism mainly reflect between-person dynamics—that is, shifts in the between-person rank ordering of individuals' solidarity levels rather than within-person changes relative to individuals' average levels of each construct.

Thus, the results broadly support our hypothesis that in-group satisfaction and collective narcissism have divergent relationships with solidarity in face of COVID-19. Those who felt happy to be Polish were more likely to show solidarity in response to the pandemic, whereas those who felt Poland was exceptional but insufficiently recognized by others demonstrated lower solidarity. Echoing previous work (Golec de Zavala, 2019), the negative association between collective narcissism and solidarity was only observed when the overlap between in-group satisfaction and collective narcissism was accounted for. In this respect, the present findings add to a growing body of research suggesting that in-group satisfaction and collective narcissism have distinct relationships with prosocial behavior once their overlap is statistically accounted for (Golec de Zavala et al., 2013; Golec de Zavala & Bierwiaczonek, 2020; Marchlewska et al., 2020; Mole et al., 2020).

As such, our results indicate that not all positive beliefs about the national in-group are equivalent to one another or have the same consequences. Most importantly, they suggest that not all positive in-group beliefs facilitate social solidarity. In this respect, our findings further develop the theory of collective narcissism. The negative association between collective narcissism and solidarity supports previous theorizing that collective narcissists *objectify* their in-groups. Collective narcissism compensates for low self-esteem and reflects a desire for self-importance projected onto an in-group (Golec de Zavala et al., 2019; Golec de Zavala & Keenan, 2020). According to this account, collective narcissism is motivated by a shared perception of threat to self-importance, rather than a sense of common fate conducive to social solidarity. This lack of concern for others is thus a defining feature of narcissism, whether it be at the individual or collective level.

Though not our main focus, the supplemental analyses were also instructive. First, analyses including the five moral foundations (Graham et al., 2009) indicated that the hypothesized relationships were not reducible to basic moral concerns. Though the moral foundations of care and fairness had strong relationships with solidarity, both in-group satisfaction and collective narcissism

continued to have the predicted associations with solidarity after the former variables were accounted for. To be sure, the relationships between in-group satisfaction and collective narcissism and solidarity were smaller once moral foundations were added. This was especially the case for in-group satisfaction. Given the strong relationships between care and fairness and solidarity, this result suggests that the impact of in-group satisfaction might be accounted for in part by its relationship with moral concerns focused on the well-being and rights of other people (Haidt, 2012).

Second, analyses including individual narcissism indicated that the relationships between collective narcissism and in-group satisfaction and COVID-19 solidarity were unchanged once individual feelings of exaggerated excellence and entitlement were accounted for. It is especially noteworthy that negative relationship between collective narcissism and solidarity was robust to the inclusion of individual narcissism in the models, given that the latter is a negative predictor of prosocial behavior in interpersonal contexts (Konrath & Tian, 2018). This suggests that the negative implications of collective narcissism for solidarity cannot be explained by the correlation between collective and individual narcissism.

Our study does leave us with a few unresolved questions. One of these centers on the discrepancy between the overall dynamics in the CLPM and the within-person dynamics isolated by the RI-CLPM. Our results here may reflect a general absence of within-person dynamic effects once trait-like individual differences in in-group satisfaction, collective narcissism, and solidarity are accounted for (Hamaker et al., 2015). This interpretation is consistent with the strong stability estimates for our variables, which are often thought of as stable individual-difference constructs (Golec de Zavala et al., 2019). However, the discrepancy may also reflect the relatively-small number of waves in our study and the short lags between them (1-2 weeks); our study may not have covered a sufficient period of time to detect within-person dynamics. A second question arises from that fact that our data are from a single national context: Poland. Though our sample benefits from its large

size and panel design, its focus on a sole nation raises questions about how well our results are likely to generalize to other national contexts. Though findings suggesting that in-group satisfaction and collective narcissism have distinct effects replicate in multiple nations (Golec de Zavala et al., 2019), it is possible that the dynamics of the relationship between the two forms of group attachment and pandemic solidarity may differ outside Poland.

Despite these questions, our results shed important light on how national identity is linked with social solidarity in the face of a global pandemic. As our analysis suggests, different forms of positive in-group belief relate in distinct ways to solidarity in the face of the current crisis. Generalized feelings of national pride are associated with greater solidarity, but an exaggerated, fragile view of the national in-group's worth appears to impede a willingness to unite and work together with others to face a global public-health challenge.

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Supplemental Materials

1. Additional Sample and Measure Information

Sample Characteristics

Wave 3 respondents (465 women, 424 men) ranged between 18 and 93 years in age (M=45.81, SD=15.85), Wave 4 respondents (427 women, 399 men) ranged between 18 and 93 years in age (M=46.15, SD=15.75), Wave 5 respondents (421 women, 387 men) ranged between 18 and 93 years in age (M=46.15, SD=15.75), and Wave 6 respondents (405 women, 380 men) ranged between 18 and 93 years in age (M=45.99, SD=15.76).

Question Wordings for Key Measures

Collective narcissism. This was assessed using the five-item version of the Collective Narcissism Scale (Golec de Zavala et al., 2013). The items were: "If Poland had a major say in the world, the world would be a much better place," "Poland deserves special treatment," "It really makes me angry when others criticize Poland," "Not many people seem to fully understand the importance of Poland," and "I will never be satisfied until Poland gets the recognition it deserves."

In-group satisfaction. This was measured using four items (Leach et al. 2008). The items included: "I am glad to be Polish," "I think that Poles have a lot to be proud of," "It is pleasant to be Polish," and "Being Polish gives me a good feeling."

COVID-19 solidarity. Solidarity with others during the COVID-19 pandemic was assessed with six items: "I have a feeling of solidarity with those who may be infected by coronavirus," "We should be united because we all can be infected by coronavirus," "We should unite in the face of the pandemic," "Each of us can play a positive role in the fight against the spread of the coronavirus," "It is our common responsibility to fight the spread of the virus," and "I feel connected to others in the fight against the spread of the virus."

Additional Measures Included in the Panel Study

The panel study was omnibus in nature and aimed at examining a variety of hypotheses in the context of the campaign leading up to the 2020 Polish presidential election (originally scheduled for 10 May but postponed due to COVID-19). Thus, the panel study as a whole was not focused on or fielded solely for the purpose of testing the hypothesis we examine in the present study. As such, it contained many variables not pertinent to the study we report here. Though collective narcissism, in-group satisfaction, moral foundations, individual narcissism, and the demographic variables were included for use in a variety of studies to be conducted with the panel data, COVID-19 solidarity was included only for the purposes of the present analysis.

A list of the other measures included in various waves of the study is as follows: ambivalent sexism (i.e., benevolent sexism and hostile sexism), attitudes toward Syrians (positive and negative emotions), attitudes toward Ukrainians (positive and negative emotions, social distance), attributions of mind to groups, attributions of mind to individual group members, church attendance frequency, emotional resilience, rejection of non-traditional women, rejection of lesbians and gay men, traditional gender beliefs, individual aggressiveness, intention to vote in the presidential election, desire for national cohesiveness, hedonic value of revenge, left-right self-placement, liberal-conservative identification, life satisfaction, modern homophobia, nationalism, partisan vote preference, presidential-vote preference, perception of individual, family's and country's material situation , religiosity, right-wing authoritarianism, personal self-esteem, social dominance orientation, trust in government's reactions to the pandemic, trust in people during the pandemic, and vulnerable narcissism.

2. Attrition Analysis for Panel Models

To determine whether panel attrition was associated with any of our three main constructs from Wave 3 to Wave 6, Wave 3 respondents who also completed Wave 6 were compared with respondents who completed only Wave 3 on Wave 3 collective narcissism, in-group satisfaction, and solidarity. Respondents who completed the Wave 3 only and those who completed Wave 6 did not differ on ingroup satisfaction, *diff*=0.004, $t(887)$=0.21, $p>0.250$, d=0.019; CN, *diff*=0.008, $t(887)$=0.32, $p>0.250$, d=0.029; or solidarity, *diff*=0.011, $t(887)$=0.65, $p>0.250$, d=0.056. Thus, our data provides little evidence for significant panel attrition across the two key waves used in our analysis.

3. Measurement Models for Collective Narcissism and In-group Satisfaction

To confirm that our two key independent variables were distinct constructs in empirical terms, we estimated a two-factor measurement model in Waves 3, 4, 5, and 6. In the model estimated in each wave, the individual collective narcissism (CN) and in-group satisfaction (IS) items were specified as indicators of separate but correlated latent factors corresponding to each construct. The models were estimated in R (version 3.6.3) with the `lavaan` package (version 0.6-5) using maximum likelihood with the Satorra-Bentler correction for non-normality (MLM; Rosseel, 2012; Satorra & Bentler, 1994). The fit statistics for the three-factor measurement models are summarized in Table A1; all statistics incorporate the Satorra-Bentler correction. The fit of this model was adequate in each wave. Despite the relatively large chi-squares (a function of the large sample sizes in each wave), the fit of the model was good according to both the CFI (0.97 in Wave 3, 0.98 in Wave 4-6) and RMSEA (0.07 in all waves). In all waves, CN and IS were correlated ($\varphi = 0.58$, in Wave 3; $\varphi = 0.60$, in Wave 4; $\varphi = 0.59$, in Wave 5; $\varphi = 0.60$, in Wave 6; all ps<0.001). The standardized loadings of each item on its corresponding latent factor were all greater than 0.75.

For comparison, we also estimated a one-factor model in each wave, where the CN and IS items were all allowed to load on a single group-attachment dimension. These models are also summarized in Table A1. As the fit statistics for the one-factor model in each wave indicate, this model fit the data poorly compared to the two-factor model. The two-factor model provided a significantly superior fit relative to the one-factor model in Wave 3, $\Delta \chi^2(1) = 444.17$, $p<0.001$; Wave 4, $\Delta \chi^2(1) = 596.62$, $p<0.001$; Wave 5, $\Delta \chi^2(1) = 529.87$, $p<0.001$; and Wave 6, $\Delta \chi^2(1) = 1174.20$, $p<0.001$. Within each wave, a comparison of the Akaike Information Criterion (AIC) indices for the models also suggested a superior fit for the two-factor model relative to the one-factor model: the former consistently has a lower AIC than the latter. Thus, our data suggest that CN and IS are distinct but related variables.

Table A1. Confirmatory Measurement Models for Collective Narcissism and Ingroup Satisfaction in

Waves 3-6

	Wave 3 Estimates				
Model	χ^2 (df)	CFI	RMSEA	AIC	SRMR
One factor	1419.67 (27)	0.71	0.24	-2641.30	0.18
Two factors	154.01 (26)	0.97	0.07	-4651.24	0.06
	Wave 4 Estimates				
Model	χ^2 (df)	CFI	RMSEA	AIC	SRMR
One factor	1264.98 (27)	0.73	0.24	-2521.57	0.18
Two factors	129.86 (26)	0.98	0.07	-4291.83	0.05
	Wave 5 Estimates				
Model	χ^2 (df)	CFI	RMSEA	AIC	SRMR
One factor	1375.83 (27)	0.72	0.25	-2709.28	0.18
Two factors	118.88 (26)	0.98	0.07	-4622.58	0.05
	Wave 6 Estimates				
Model	χ^2 (df)	CFI	RMSEA	AIC	SRMR
One factor	1408.15 (27)	0.72	0.26	-2342.36	0.18
Two factors	138.53 (26)	0.98	0.07	-4247.78	0.05

Note. The one-factor model specifies all items from both scales as indicators of a single factor; the

two-factor model specifies the collective-narcissism and ingroup-satisfaction items as indicators of

two separate but correlated factors. All fit indices are Satorra-Bentler corrected statistics. $N = 889$,

for Wave 3; $N = 826$, for Wave 4; $N = 808$, for Wave 5, $N = 785$, for Wave 6.

4. Main Cross-Sectional Models

Results for Waves 4-6

To replicate the cross-sectional results reported for Wave 3, we repeated the same analysis summarized in Table 2 in Waves 4-6. Model specifications were the same, and the analyses used the CN, IS, and solidarity measures from the corresponding wave; the covariates were all measured in Wave 1. All models were estimated using ordinary least-squares with HC3 robust standard errors.

The results of these analyses are summarized in Table A2. As the unstardardized estimates in the table indicate, the cross-sectional relationships between IS and CN (on one hand) and solidarity (on the other) were similar to those reported for Wave 3. The standardized estimates tell a similar story: β=0.52 for IS and β=-0.17 for CN, in Wave 4; β=0.51 for IS and β=-0.20 for CN, in Wave 5; and β=0.48 for IS and β=-0.12 for CN, in Wave 6.

As in Wave 3, the estimates and conclusions for IS and CN were similar when the demographic covariates were excluded from the analyses in Waves 4-6. In Wave 4, these estimates were: b=0.49 (95% CI: 0.42, 0.56), β=0.61, p<0.001, for IS; and b=-0.19 (95% CI: -0.25, -0.14), β=-0.25, p<0.001, for CN. In Wave 5, these estimates were: b=0.51 (95% CI: 0.43, 0.58), β=0.59, p<0.001, for IS; and b=-0.21 (95% CI: -0.27, -0.15), β=-0.27, p<0.001, for CN. In Wave 6, these estimates were: b=0.47 (95% CI: 0.40, 0.54), β=0.57, p<0.001, for IS; and b=-0.17 (95% CI: -0.22, -0.11), β=-0.21, p<0.001, for CN.

Thus, the cross-sectional relationships between our core study variables remain consistent across time periods, reinforcing the evidence presented in Table 2 and Figure 1.

Sensitivity Analyses for Waves 3-6

As a check on our results, we also conducted sensitivity analyses using Frank et al.'s (2013) method. In Wave 3, these checks indicated that 85.25% of the estimate for IS would have to be due to bias and that 758 observations would need to be replaced with observations whose effect was 0 to

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invalidate its effect. For CN, they indicated that 70.43% of the estimate would have to be due to bias and that 626 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. In Wave 4, this analysis indicated that 83.30% of the estimate for IS would have to be due to bias and that 688 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. For CN, it indicated that 57.20% of the estimate would have to be due to bias and that 472 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. In Wave 5, the sensitivity checks indicated that 82.56% of the estimate for IS would have to be due to bias and that 667 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. For CN, they indicated that 60.99% of the estimate would have to be due to bias and that 493 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. Finally, in Wave 5, the sensitivity analysis indicated that 81.61% of the estimate for IS would have to be due to bias and that 641 observations would need to be replaced with observations whose effect was 0 to invalidate its effect. For CN, they indicated that 33.17% of the estimate would have to be due to bias and that 260 observations would need to be replaced with observations whose effect was 0 to invalidate its effect.

Table A2. COVID-19 Solidarity as a Function of Collective Narcissism and Ingroup Satisfaction in Waves 4-6 (Cross-Sectional Estimates)

Predictor	Wave 4			Wave 5			Wave 6		
	b	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*
Male	-0.03	[-0.06, -0.01]	0.002	-0.04	[-0.06, -0.01]	0.002	-0.04	[-0.07, -0.02]	0.001
Education	-0.01	[-0.04, 0.03]	>0.250	-0.02	[-0.06, 0.02]	0.246	0.004	[-0.04, 0.04]	>0.250
Age	0.003	[0.003, 0.004]	<0.001	0.003	[0.002, 0.004]	<0.001	0.003	[0.002, 0.004]	<0.001
Collective Narcissism	-0.13	[-0.19, -0.08]	<0.001	-0.16	[-0.22, -0.09]	<0.001	-0.09	[-0.16, -0.03]	0.004
Ingroup Satisfaction	0.42	[0.35, 0.49]	<0.001	0.44	[0.36, 0.52]	<0.001	0.39	[0.32, 0.47]	<0.001
Intercept	0.40	[0.34, 0.46]	<0.001	0.41	[0.35, 0.48]	<0.001	0.37	[0.30, 0.44]	<0.001
F (df)	92.46 (5, 820), *p*<0.001			77.48 (5, 802), *p*<0.001			67.64 (5, 779), *p*<0.001		
R^2	0.337			0.296			0.291		
N	826			808			785		

Note. Entries are ordinary least-squares regression coefficients and HC3 robust standard errors.

5. Cross-Sectional Models with Moral Foundations as Covariates

A first set of robustness checks re-estimated the models presented in Table 2 with five additional covariates added: Graham, Haidt, and Nosek's (2009) five moral foundations: *care for others*, *fairness*, *ingroup loyalty*, *respect for authority*, and *purity*. The moral foundations represent intuitive bases of moral judgment focused on protecting the well-being and rights of individuals (i.e., the 'individualizing' foundations of care and fairness foundations) and cohesion in group life (i.e., the 'binding' foundations of ingroup loyalty, authority, purity). Given that solidarity with others in the face of adversity has a moral component, we might expect several of the moral foundations to be associated with COVID-19 solidarity; their effects may also be confounded with those of in-group satisfaction (IS) and collective narcissism (CN). In particular, care for others may increase solidarity by boosting concern for those affected by COVID-19, while ingroup loyalty may increase solidarity by supporting group cohesion. Similarly, fairness and respect for authority may indirectly reflect solidaristic concerns by promoting concern for just treatment of individuals and deference to leaders in a crisis. On the other hand, given that purity is often associated with fears of contamination, it may possibly be negatively associated with solidarity in the face of a disease (Graham et al., 2009; Haidt, 2012).

The five moral foundations were assessed in both Waves 3 and 4 using a Polish version of the Moral Foundations Questionnaire, consisting of the Moral Relevance and Moral Judgments subscales (Graham et al. 2009). For Moral Relevance, respondents were given the prompt "When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?" when evaluating the relevance of 15 concerns pertaining to the 5 moral foundations (e.g., "whether or not someone was harmed"). These items used a scale ranging from 0 (*I do not consider this concern relevant*) to 10 (*I consider this concern particularly relevant*). For Moral Judgments, respondents indicated agreement or disagreement with 15 statements pertaining to 5 moral

foundations (e.g., "It is more important to be a team player than to express oneself "). Participants responded using a scale from 0 (*totally disagree*) to 10 (*totally agree*). Items from both subscales were recoded to run from 0 to 1 and then averaged to form 5 scales corresponding to moral foundations of care (α =.82, M = 0.75, SD = 0.17, in Wave 3; α =.84, M = 0.74, SD = 0.18, in Wave 4; α =.85, M = 0.75, SD = 0.18, in Wave 5; α =.85, M = 0.74, SD = 0.18, in Wave 6), fairness (α =.74, M = 0.71, SD = 0.15, in Wave 3; α =.77, M = 0.71, SD = 0.16, in Wave 4; α =.76, M = 0.71, SD = 0.16, in Wave 5; α =.77, M = 0.70, SD = 0.16, in Wave 6), ingroup loyalty (α =.74, M = 0.64, SD = 0.16, in Wave 3; α =.75, M = 0.62, SD = 0.17, in Wave 4; α =.77, M = 0.62, SD = 0.17, in Wave 5; α =.76, M = 0.62, SD = 0.17, in Wave 6), authority (α =.73, M = 0.61, SD = 0.17, in Wave 3; α =.78, M = 0.60, SD = 0.18, in Wave 4; α =.76, M = 0.59, SD = 0.18, in Wave 5; α =.76, M = 0.59, SD = 0.18, in Wave 6), and purity (α =.76, M = 0.68, SD = 0.17, in Wave 3; α =.77, M = 0.68, SD = 0.18, in Wave 4; α =.76, M = 0.67, SD = 0.17, in Wave 5; α =.79, M = 0.67, SD = 0.18, in Wave 6).

The estimates for these expanded models in Waves 3 and 4 are summarized in Table A3. Looking at the estimates for IS and CN, we see results that are substantively similar to those in Table 2. In Wave 3, IS was positively related to COVID-19 solidarity (b=0.18, β=0.21, p<0.001), and CN was negatively related to solidarity (b=-0.10, β=-0.13, p<0.001). In Wave 4, IS was positively related to solidarity (b=0.21, β=0.25, p<0.001), whereas CN was negatively related to COVID-19 solidarity (b=-0.11, β=-0.14, p<0.001). In Wave 5, IS was positively related to COVID-19 solidarity (b=0.21, β=0.24, p<0.001), and CN was negatively related to solidarity (b=-0.10, β=-0.12, p=0.009). Finally, in Wave 6, IS was again positively related to COVID-19 solidarity (b=0.18, β=0.22, p<0.001). However, while the relationship between CN and solidarity was negative as predicted in Wave 6, it was relatively weak an did not reach significance (b=-0.06, β=-0.07, p=0.107). Though the magnitudes of the coefficients for IS and CN are both reduced once the moral foundations are considered, the estimates for IS are more attenuated in magnitude than those for CN. This suggests

that consequences of in-group satisfaction for solidarity may be more bound up with morality than the consequences of collective narcissism are. Given that we treat them as covariates in the analyses, we do not interpret the coefficients for the moral foundations in detail. However, it is worth noting that the individualizing foundations are especially strong predictors of solidarity in both waves (all ps<0.01), implying that concerns about the well-being and fair treatment of individuals are especially relevant for solidarity in the face of the COVID-19 pandemic.

Table A3. COVID-19 Solidarity as a Function of Collective Narcissism and Ingroup Satisfaction in Waves 3-6, with Moral Foundations as Covariates (Cross-Sectional Estimates)

Predictor	Wave 3			Wave 4			Wave 5			Wave 6		
	b	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*
Male	-0.02	[-0.04, -0.01]	0.009	-0.01	[-0.03, 0.004]	0.129	-0.01	[-0.03, 0.01]	>0.250	-0.02	[-0.04, 0.01]	0.156
Education	0.03	[-0.001, 0.06]	0.060	-0.01	[-0.04, 0.02]	>0.250	-0.03	[-0.06, 0.01]	0.101	-0.001	[-0.03, 0.03]	>0.250
Age	0.001	[0.001, 0.002]	<0.001	0.001	[0.001, 0.002]	<0.001	0.001	[0.0004, 0.002]	0.003	0.001	[0.0003, 0.002]	0.006
CN	-0.10	[-0.15, -0.05]	<0.001	-0.11	[-0.16, -0.05]	<0.001	-0.09	[-0.17, -0.02]	0.009	-0.06	[-0.12, 0.01]	0.107
IS	0.18	[0.12, 0.23]	<0.001	0.21	[0.14, 0.27]	<0.001	0.21	[0.13, 0.28]	<0.001	0.18	[0.11, 0.25]	<0.001
Care	0.35	[0.23, 0.47]	<0.001	0.33	[0.22, 0.44]	<0.001	0.32	[0.18, 0.47]	<0.001	0.34	[0.21, 0.47]	<0.001
Fairness	0.23	[0.12, 0.33]	<0.001	0.29	[0.18, 0.40]	<0.001	0.27	[0.14, 0.41]	<0.001	0.23	[0.08, 0.37]	0.002
Ingroup	0.10	[-0.004, 0.21]	0.059	0.02	[-0.08, 0.12]	>0.250	-0.03	[-0.17, 0.09]	>0.250	0.03	[-0.10, 0.16]	>0.250
Authority	-0.07	[-0.18, 0.03]	0.177	0.01	[-0.09, 0.11]	>0.250	0.01	[-0.10, 0.13]	>0.250	-0.04	[-0.17, 0.09]	>0.250
Purity	0.18	[0.06, 0.29]	0.002	0.10	[-0.01, 0.21]	0.078	0.17	[0.03, 0.31]	0.016	0.17	[0.05, 0.29]	0.007
Intercept	0.07	[0.01, 0.12]	0.014	0.09	[0.03, 0.15]	0.002	0.08	[0.02, 0.14]	0.009	0.07	[-0.001, 0.13]	0.052
F (df)	146.80 (10, 878), *p*<0.001			120.32 (10, 815), *p*<0.001			124.98 (10, 797), *p*<0.001			97.84 (10, 774), *p*<0.001		
R²	0.588			0.597			0.532			0.515		
N	889			826			808			785		

Note. Entries are ordinary least-squares regression coefficients and HC3 robust standard errors.

6. Cross-Sectional Models with Individual Narcissism as a Covariate

A second set of robustness checks re-estimated the models presented in Tables 2 and A2 with a measure of individual-level narcissism added as a covariate. The analysis summarized in Table 2 suggests that collective narcissism is negatively associated with solidarity in the face of COVID-19 once in-group satisfaction is accounted for. However, a potential further complication is that CN is positively correlated with *individual narcissism* (i.e., a desire for continual external validation of the personal or individual self-concept; see Crocker & Park, 2004; Morf, & Rhodewalt, 2001; Rhodewalt & Sorrow, 2003). Since individual narcissism is also a robust predictor of selfishness and competitiveness, we additionally sought to disambiguate the specific relationship between CN and group solidarity in face of the emergency by controlling for individual narcissism in supplementary analyses. In this respect, it is worth noting that previous studies have not clearly demonstrated that the association between CN and selfishness cannot be explained by the positive overlap between CN and individual narcissism (Marchlewska, et al., 2020).

Individual narcissism was assessed in both Waves 3-6 using a modified Polish-language version of the Narcissistic Personality Inventory-13 (NPI-13; Gentile et al., 2013). The original version of the NPI-13 asks participants to indicate which of two statements about the self—a "narcissistic" one or a "non-narcissistic" one—best characterizes them. In the version used here (e.g., Golec de Zavala et al., 2009), participants were simply presented with the narcissistic statement option from each item and asked to indicate how much they agreed or disagreed that it characterized them on a scale ranging from 0 (*totally disagree*) to 10 (*totally agree*). Items were recoded to run from 0 to 1 and then averaged to form a scale in each wave; higher scores indicated greater individual narcissism ($\alpha =.92$, $M = 0.45$, $SD = 0.19$, in Wave 3; $\alpha =.91$, $M = 0.45$, $SD = 0.18$, in Wave 4; $\alpha =.92$, $M = 0.44$, $SD = 0.19$, in Wave 5; $\alpha =.91$, $M = 0.45$, $SD = 0.18$, in Wave 6). Consistent with earlier findings (Golec de Zavala et al., 2009), individual narcissism was positively correlated with

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CN in Wave 3 (r=0.47, p<0.001), Wave 4 (r=0.46, p<0.001), Wave 5 (r=0.43, p<0.001), and Wave 6 (r=0.45, p<0.001).

The estimates for these models in Waves 3-6 are summarized in Table A4. Looking at the estimates for IS and CN, we see results that are substantively similar to those in Table 2. These estimates are virtually unchanged in magnitude compared to their equivalents in the models reported in Tables 2 and A2, despite the correlation between CN and individual-level narcissism. Moreover, individual narcissism was only weakly and inconsistently predictive in the models. It was virtually unrelated to solidarity in Wave 3 (b=-0.01, β=-0.01, p>0.250), marginally related to greater solidarity in Wave 4 (b=0.07, β=0.06, p=0.095) and Wave 5 (b=0.09, β=0.08, p=0.081), and positively but non-significantly related to solidarity in Wave 6 (b=0.07, β=0.06, p=0.103).

Table A4. COVID-19 Solidarity as a Function of Collective Narcissism and Ingroup Satisfaction in Waves 3-6, with Individual Narcissism as a Covariate (Cross-Sectional Estimates)

Predictor	Wave 3			Wave 4			Wave 5			Wave 6		
	b	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*
Male	-0.05	[-0.07, -0.03]	<0.001	-0.04	[-0.06, -0.01]	0.002	-0.04	[-0.06, -0.01]	0.003	-0.04	[-0.07, -0.02]	0.002
Education	0.03	[-0.01, 0.06]	0.164	-0.01	[-0.05, 0.03]	>0.250	-0.03	[-0.07, 0.01]	0.160	0.001	[-0.04, 0.04]	>0.250
Age	0.003	[0.002, 0.004]	<0.001	0.004	[0.003, 0.004]	<0.001	0.003	[0.002, 0.004]	<0.001	0.003	[0.002, 0.004]	<0.001
CN	-0.14	[-0.19, -0.09]	<0.001	-0.15	[-0.22, -0.09]	<0.001	-0.19	[-0.26, -0.11]	<0.001	-0.12	[-0.19, -0.05]	0.001
IS	0.44	[0.37, 0.50]	<0.001	0.43	[0.36, 0.50]	<0.001	0.45	[0.37, 0.53]	<0.001	0.39	[0.32, 0.47]	<0.001
NPI	-0.01	[-0.09, 0.06]	>0.250	0.07	[-0.01, 0.14]	0.095	0.09	[-0.01, 0.18]	0.081	0.07	[-0.01, 0.16]	0.103
Intercept	0.41	[0.35, 0.48]	<0.001	0.37	[0.30, 0.44]	<0.001	0.38	[0.29, 0.46]	<0.001	0.34	[0.26, 0.42]	<0.001
F (df)	90.92 (6, 882), *p*<0.001			77.27 (6, 819), *p*<0.001			64.73 (6, 801), *p*<0.001			56.75 (6, 778), *p*<0.001		
R²	0.335			0.340			0.301			0.294		
N	889			826			808			785		

Note. Entries are ordinary least-squares regression coefficients and HC3 robust standard errors.

7. Cross-Sectional Models: Two-Stage Least Squares

A third set of robustness checks focuses on the possibility cross-sectional nature of the analyses presented in Tables 2 and A2 means that the crucial estimates for collective narcissism (CN) and in-group satisfaction (IS) may be biased by endogeneity (i.e., a bias-inducing correlation between predictors and the error term in the regression) due to feedback effects of the dependent variable on one or more of the independent variables or to omitted independent variables. To address this concern, we re-estimated the models for Waves 3-6 in Tables 2 and A2 using two-stage least squares (2SLS; Wooldridge, 2013). This procedure replaces the potentially-endogenous predictors (CN and IS) with 'instrumental variables' that do not share variance with the error term in the original ordinary least-squares equations reported in Tables 2 and A2. As instruments in the Waves 3-6 analyses, we used the Wave 1 and Wave 2 measurements of CN and IS. These variables were measured using the same items as in Waves 3 and 4 (Wave 1 CN: $\alpha = 0.90$, $M = 0.49$, $SD = 0.25$; Wave 2 CN: $\alpha = 0.91$, $M = 0.50$, $SD = 0.25$; Wave 1 IS: $\alpha = 0.93$, $M = 0.70$, $SD = 0.23$; Wave 2 IS: $\alpha = 0.95$, $M = 0.70$, $SD = 0.23$).

The 2SLS estimates for Waves 3-6 are summarized in Table A5. Shea's (1997) partial R^2 indicated that the instruments were strong with respect to both endogenous variables in Wave 3 (0.62 for CN, 0.63 for IS), Wave 4 (0.58 for CN, 0.59 for IS), Wave 5 (0.58 for CN, 0.56 for IS), and Wave 6 (0.55 for CN, 0.53 for IS). Looking at the estimates for the two key variables, we see results similar to those produced by the ordinary least-squares models in Tables 2 and A2, and consistent with our hypothesis. Thus, 2SLS estimation largely confirms our ordinary least-squares results.

Table A5. COVID-19 Solidarity as a Function of Collective Narcissism and Ingroup Satisfaction in Waves 3-6 (Cross-sectional Estimates, Two-Stage Least Squares)

Predictor	Wave 3			Wave 4			Wave 5			Wave 6		
	b	*95% CI*	*p*	*b*	*95% CI*	*p*	*b*	*95% CI*	*p*	*B*	*95% CI*	*p*
Male	-0.05	[-0.07, -0.03]	<0.001	-0.04	[-0.06, -0.01]	0.002	-0.04	[-0.06, -0.02]	0.001	-0.04	[-0.06, -0.01]	0.003
Education	0.02	[-0.01, 0.05]	>0.250	-0.01	[-0.05, 0.03]	>0.250	-0.02	[-0.06, 0.012]	0.233	-0.001	[-0.04, 0.04]	>0.250
Age	0.003	[0.002, 0.004]	<0.001	0.003	[0.003, 0.004]	<0.001	0.003	[0.002, 0.003]	<0.001	0.003	[0.002, 0.004]	<0.001
CN	-0.16	[-0.23, -0.10]	<0.001	-0.17	[-0.24, -0.10]	<0.001	-0.20	[-0.28, -0.13]	<0.001	-0.14	[-0.22, -0.06]	0.001
IS	0.47	[0.39, 0.54]	<0.001	0.45	[0.37, 0.53]	<0.001	0.52	[0.43, 0.60]	<0.001	0.46	[0.36, 0.54]	<0.001
Intercept	0.40	[0.34, 0.45]	<0.001	0.41	[0.35, 0.46]	<0.001	0.40	[0.34, 0.46]	<0.001	0.36	[0.30, 0.42]	<0.001
F (df)	72.62 (5, 843), $p<0.001$			66.26 (5, 782), $p<0.001$			59.85 (5, 773), $p<0.001$			52.58 (5, 751), $p<0.001$		
R^2	0.329			0.331			0.301			0.283		
N	849			788			779			757		

Note. Entries are two-stage least-squares regression coefficients and standard errors. In each wave, collective narcissism and ingroup satisfaction are treated as endogenous variables, and Wave 1 collective narcissism, Wave 1 ingroup satisfaction, Wave 2 collective narcissism, and Wave 2 ingroup satisfaction are used as instruments.