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Communal narcissism: Social decisions and neurophysiological reactions ☆,☆☆,★

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ABSTRACT

Communal narcissists claim a saintly status, but are they fairer than non-narcissists? In Study 1, high (vs. low) communal narcissists did not make more equitable offers and were not more likely to reject inequitable offers in an ultimatum game. However, they reported being more altruistic, judging fairness as a more important moral value, and being more morally outraged at unfairness. Their self-views did not match their behavior. These results were replicated in Study 2, where in addition high (vs. low) communal narcissists exhibited larger P3 amplitudes to inequitable (than equitable) offers, suggesting that they were more emotionally sensitive to unfairness. Their neurophysiological reactions did not match their behavior. The findings clarify the construct of communal narcissism.

1. Introduction

Communal narcissism, as a construct, is founded in the interpersonal circle model (Leary, 1957), interpersonal circumplex models (Gurtman, 2009; Horowitz et al., 2006), and clinical views on narcissism that include a self-sacrificing self-enhancement component (e.g., the Pathological Narcissism Inventory; Pincus et al., 2009). Gebauer, Sedikides, Verplanken, and Maio (2012) differentiated this construct from agentic narcissism. Whereas agentic narcissists satisfy their core self-motives (i.e., grandiosity, self-esteem, entitlement, power) in the agentic domain (e.g., competence, drive, ambition), communal narcissists satisfy their core self-motives in the communal domain (e.g., interpersonal concern, warmth, cooperation). This conception of communal narcissism has been backed by other research (Barry, Lui, Lee-Rowland, & Moran, 2016; Giacomin & Jordan, 2015), which established distinct genetic pathways for communal (vs. agentic) narcissism (Luo, Cai, Sedikides, & Song, 2014).

Communal narcissists consider themselves saintly figures who harbor noble intentions toward others and the world. And yet they self-enhance (Gebauer & Sedikides, in press-a, in press-b). In particular, they ascertain their superiority by amplifying their prosocial traits (e.g., caring, helpful), emphasizing their relevance to others (e.g., enriching others' lives, leaving a legacy of benevolence), and underscoring their impact on the world at large (e.g., reducing inequality, bringing justice and peace). Communal narcissism is found both in Western (Barry et al., 2016; Gebauer et al., 2012; Giacomin & Jordan, 2015; Nehrlich, Gebauer, Sedikides, & Schoel, 2018; Żemojtel-Piotrowska, Czarna, Piotrowski, Baran, & Maltby, 2016) and East-Asian (i.e., Chinese; Gebauer, Zhu, Cai, Sedikides, & Gaertner, 2018; Luo et al. (2014)) cultures.

Communal narcissists think of themselves as other-oriented and pillars of fairness. We asked in this article how communal narcissists respond explicitly (i.e., behaviorally) and react implicitly (i.e., neurophysiologically) to fairness or unfairness. Do they behave more fairly, when given an opportunity to benefit the self?

☆ Huajian Cai, Ruolei Gu, Yu L. L. Luo, Yuqi Wang, Ziyan Yang and Constantine Sedikides designed the studies. Yuqi Wang, Ziyan Yang, Ying Yang and Mingzheng Wu collected the data. Ziyan Yang and Ruolei Gu analyzed the data. Ziyan Yang and Constantine Sedikides drafted the manuscript. Huajian Cai, Ruolei Gu, and Yu L. L. Luo added inputs.

☆☆ Data will not be shared because some data belong to a longitudinal study that has not been published.

★ The reported studies were not pre-registered.

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Do they tolerate being treated unfairly for the sake of others, when presented with a self-benefiting alternative? Do their subjective reports (i.e., self-views) match their behavior? And do their behavioral responses map onto their neurophysiological reactions to unfairness? We addressed these questions in two quasi-experiments. Study 1, involving an Ultimatum Game (UG), examined subjective reports and behavioral responses. Study 2, involving event-related potential (ERP), examined not only behavioral responses but also neurophysiological reactions.

1.1. Communal narcissism and social decision-making

We define social decision-making as making decisions in interdependent settings where the two parties' interests are not fully aligned (Rusbult & Van Lange, 2003). As such, one's decisions may reflect self-interest or other-interest (Gintis, Bowles, Boyd, & Fehr, 2003; Ruff & Fehr, 2014). Economic games, such as the UG (Güth, Huck, & Müller, 2001; Güth, Schmittberger, & Schwarze, 1982), are fitting examples of social decision-making. In the UG, participants play the roles of proposer and responder. The proposer splits an amount of reward (e.g., money, points) between the players, whereas the responder accepts or rejects the distribution (i.e., offer or deal). Proposer and responder will earn the specified reward if the offer is accepted, but will gain nothing if the offer is rejected. It is then to the proposer's self-interest to make inequitable offers,[1] and to the responder's self-interest to accept all offers regardless of perceived (un)fairness. This is what the principle of self-benefit maximization would suggest (Güth et al., 1982; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003). Evidence, though, indicates that players care about fairness. Proposers often make equitable offers (Güth & Tietz, 1990; Güth et al., 1982), especially when reputational information links the responder with trustworthiness (Nowak, Page, & Sigmund, 2000). Responders are more likely to reject inequitable than equitable offers (Nowak et al., 2000; Thaler, 1988), while reporting negative emotional reactions (e.g., anger) to unfairness (Sanfey et al., 2003).

1.1.1. Communal narcissists as proposers

We asked how communal narcissists would behave as proposers. Communal narcissists think of themselves as paragons of fairness (Gebauer & Sedikides, in press-a, in press-b). As such, they would be expected to make more equitable than inequitable offers (relative to lows). However, communal narcissists' social behavior is geared toward the satisfaction of core self-motives (Gebauer et al., 2012; Giacomin & Jordan, 2015), and, congruent with this viewpoint, their fairness rhetoric is not shared by observers, who fail to distinguish their benevolence from that of low communal narcissists (Barry et al., 2016; Gebaeur et al., 2012, Study 5; Nehrlich et al., 2018). As such, highs would not be expected to behave more equitably than lows. We tested these contrasting derivations in Studies 1–2.

1.1.2. Communal narcissists as responders

We also wondered how communal narcissists would behave as responders. Communal narcissists appear to be gravely concerned with fairness, claiming a considerable stake on other-directed fairness (e.g., others' wellbeing, self-sacrificial behavior; Gebauer & Sedikides, in press-a, in press-b). Rejecting an inequitable offer would imply zero gains for proposers, offending communal narcissists' sense of other-directed fairness. Hence, they may be particularly prone to accepting inequitable offers, reinforcing their self-views as martyrs. However, assuming communal narcissists' social behavior is guided by self-motives, as observers seem to believe (Gebauer & Sedikides, in press-a, in press-b), acceptance of inequitable offers would also offend their sense of self-directed fairness. As such, they may be concurrently prone to rejecting inequitable offers. This friction between other-directed and self-directed fairness may manifest itself as a null effect (i.e., no difference between responses of highs and lows to offers). We tested these contrasting derivations in Studies 1–2.

1.2. Communal narcissism and neurophysiological reactions

A premise of our work involves the putative tension between communal narcissists' self-views and behavior (Study 1) and, more importantly, between their self-directed fairness (i.e., core self-motives) and their behavior (Studies 1–2). We sought to capture the latter tension via electroencephalogram (EEG), which we recorded among UG responders only (for a similar practice, see: Gu et al., 2016; Luo, Wu, et al., 2014) in Study 2. Given their high temporal resolution, ERP techniques have the potential to offer insights into the temporal dynamics of decision-making (Luck, 2014). Such techniques can be regarded as indices of implicit reactions to stimuli (i.e., UG offers; for a use of the term implicit in conjunction with neurophysiological or ERP reactions, see Lust & Bartholow, 2010). If so, ERP techniques are suitable for addressing an explicit-implicit dissociation among high (vs. low) communal narcissists. We relied on two ERP components most commonly used in decision-making research: feedback-related negativity (FRN) and P3 (San Martín, 2012). These components could allow us to capture neurophysiological reactions that precede behavioral responses to UG offers.

1.2.1. Feedback-related negativity

The FRN component is a fronto-central negativity that peaks at approximately 200–300 ms following an outcome (e.g., UG offer; Gehring & Willoughby, 2002). The FRN is linked to rapid evaluation of outcome valence (Holroyd, Hajcak, & Larsen, 2006; Yeung & Sanfey, 2004). In economic decision-making tasks, the FRN automatically encodes the monetary value of feedback, such that losses elicit a larger FRN than gains (San Martín, 2012). In social decision-making tasks (e.g., the UG), inequitable offers also elicit a larger FRN than equitable offers (Boksem & De Cremer, 2010; Hewig et al., 2011; Van der Veen & Sahibdin, 2011). Given that the FRN is an automatic monitor of unfairness, we expected that it would be more pronounced under inequitable than equitable offers. Our main interest, though, was in the role of communal narcissism. If high (vs. low) communal narcissists were more likely to encode automatically the inequitable (than equitable) offers as more unfair, then we would observe a larger FRN. On the other hand, if they did not discriminate at encoding the unfairness (vs. fairness) value of offers, then we would observe no differences in FRN. We put these possibilities to test in Study 2.

1.2.2. P3

The P3 component is a centro-parietal positivity that appears at about 300–600 ms following outcome presentation (San Martín, 2012). The P3 is linked to the emotional significance of an outcome (Nieuwenhuis, Aston-Jones, & Cohen, 2005; Olofsson, Nordin, Sequeira, & Polich, 2008), such that increased P3 amplitude reflects higher emotional sensitivity. Intriguingly, emotional sensitivity may stem from inequitable offers (accompanied by elicitation of larger P3; Gu et al., 2016; Hewig et al., 2011; Luo, Wu, et al., 2014), but may also stem from equitable offers (likewise accompanied by elicitation of larger P3; Qu, Wang, & Huang, 2013; Riepl, Mussel, Osinsky, & Hewig, 2016; Wu, Leliveld, & Zhou, 2011). Yet, we thought we could still use P3 as an index of emotional sensitivity in Study 2 in order to distinguish between responses of

[1] We use the term "(in)equitable" to refer to raw offers or the offer category. We use the term "(un)fair" to describe participants' subjective judgments.

high (vs. low) communal narcissists to unfairness (vs. fairness). Our reasoning was as follows. If highs (relative to lows) were more sensitive to unfairness, we would observe larger P3 for inequitable than equitable offers. Equivalent sensitivity to these two kinds of offers would be reflected in equivalent P3.

2. Study 1

Study 1 represented our foray into the social decision-making of communal narcissists. First, participants played a slightly modified UG: They made or received offers from one of three co-players (rather than a single player), simulating the sociality of decision-making. Here, we addressed the following questions. As proposers, will high (vs. low) communal narcissists make more equitable than inequitable offers, or will they make equivalent offers? As responders, will highs (vs. lows) reject more inequitable than equitable offers, or will they be equally likely to reject these offers?

Next, participants completed several self-report measures. Here, we sought to validate the notion that communal narcissists maintain saintly self-views and to explore discrepancies between their self-views and behavior. At the dispositional level, we examined if communal narcissists imbued morality in their judgments of fairness and reported moral outrage to unfairness. At the state level, we examined how angry each offer made them feel (as responders) and if they perceived their social decision-making as altruistic.

2.1. Method

2.1.1. Participants

We capitalized on a mass-test administration of the 16-item Communal Narcissism Inventory (Gebauer et al., 2012) to 2452 Zhejiang Ocean University undergraduates (M = 4.67, SD = 0.91; α = 0.93). Sample items are: "I am the most helpful person I know" and "I am going to bring peace and justice to the world." The Chinese version of the Communal Narcissism Inventory has been used successfully in Chinese samples (Gebauer et al., 2018; Luo, Cai, et al., 2014). According to power analysis (G*Power 3.1), we needed 54 participants to ensure 95% statistical power for a medium effect size (i.e., f = 0.25; Vazire, 2016), that is, the interaction between communal narcissism and offer (see below). Given that this was our empirical foray, we opted conservatively for a somewhat larger sample.

From the 2452 respondents to the Communal Narcissism Inventory, we selected the 30% top scorers (high communal narcissists) and 30% bottom scorers (low communal narcissists). Then, we randomly invited to the laboratory 41 highs (31 men, 10 women; M_{age} = 19.66 years, SD_{age} = 1.15 years) and 40 lows (20 men, 20 women; M_{age} = 19.65 years, SD_{age} = 1.05 years). The highs (M = 5.87, SD = 0.51) and lows (M = 3.11, SD = 0.68) differed significantly on their Communal Narcissism Inventory scores, $t(79) = 20.57$, $p < .001$, d = 4.59. The practice of selecting high and low scorers on a personality scale for subsequent testing has been defended on psychometric and pragmatic grounds (Asendorpf et al., 2013). For similar selection procedures, see: Li and Yang (2013), Li, Zeigler-Hill, Luo, Yang, and Zhang (2012), Luo, Wu, et al. (2014).

All participants signed informed consent forms prior to the commencement of our study and were remunerated at the end of it (see below). The study protocol was approved by the Institutional Review Board of Institute of Psychology, Chinese Academy of Sciences.

2.1.2. Procedure

In the spirit of fostering a social environment, participants learned that they would play the UG with three (bogus) peers. (For a similar procedure, see: Gu et al., 2016; Luo, Wu, et al., 2014; Wu, Luo, Broster, Gu, & Luo, 2013.) They would play the UG in two stages, as proposers and responders. The proposer would make an offer on how to split 100 points, and the responder would accept or reject it. If the responder accepted it, the players would earn the number of points suggested by the offer; if the responder rejected it, the players would earn no points. Given that participants played the UG with three ostensible others, they were led to believe that they made offers (as proposers) to one of the three co-players at any given time, and that they received offers (as responders) from one of the three co-players at any given time. Participants were told that they would receive (1) a standard fee of 20 Chinese renminbi (RMB; approximately $3), plus (2) the UG cumulative pay, which would be commensurate to their game choices. In actually, all participants received an identical remuneration.

2.1.2.1. Proposers. As proposers, participants made 10 offers. They could choose as few or as many offers from the following distribution: 50:50, 60:40, 70:30, 80:20, 90:10 (i.e., proportion of points allocated to self:proportion of points allocated to other). Proposers learned that the offers would be presented to other three players in the responder stage. When they played as responders, they would receive offers from other three proposers (30 in total). Prior research (Gu et al., 2016; Luo, Wu, et al., 2014; Wu et al., 2013) has considered the first two (equitable) offers (50:50, 60:40) as fair, and the last two (inequitable) offers (80:20, 90:10) as unfair. Also, prior findings indicate that UG players disagree on whether the middle offer (70:30) is fair or unfair (Halko, Hlushchuk, Hari, & Schurmann, 2009). Given that the middle offer is ambiguous or nondiagnostic of equitability, and for greater clarity, we excluded it from data analyses, as per standard practice (Gu et al., 2016; Luo, Wu, et al., 2014; Wu et al., 2013).

2.1.2.2. Responders. As responders, participants made accept or reject decisions to offers. Recall that this stage comprised 30 trials, given that each responder received 10 offers from each of three proposers. Twelve of the 30 trials represented equitable offers (6 of 50:50, 6 of 40:60), 12 represented inequitable offers (6 of 10:90, 6 of 20:80), and 6 represented nondiagnostic offers (30:70), as per prior research (Gu et al., 2016; Luo, Wu, et al., 2014; Wu et al., 2013). Each trial began with the presentation of a central fixation cross for 1.5–2 s. (Randomized time intervals can optimize the efficiency of ERP studies; Luck, 2014) Next, an offer appeared for 2 s. Responders decided to accept or reject it by pressing the F or J buttons, respectively, on the keyboard with their left or right index fingers. The button assignments were counterbalanced. Afterwards, responders waited for 0.8–1.2 s to receive the outcome, which informed them of the amount of reward (i.e., points) earned (Fig. 1). Responders learned that (1) a given offer was selected randomly from one of the three proposers, (2) they would be unable to identify which proposer made the offer, and (3) the proposer could not know whether the responders accepted or rejected the offer (Boksem & De Cremer, 2010). Immediately after each trial, participants filled out a measure of anger. Finally, they completed fairness manipulation checks, as well as a state altruism measure and two dispositional measures (i.e., moral judgment of fairness, moral outrage to unfairness).

2.1.3. Measures

2.1.3.1. Manipulation check. Participants rated the offers (in a separate random order each) on "how fair do you think it was?" (1 = *not at all*, 5 = *very much*). Specifically, they rated all offers they made (50:50, 60:40, 70:30, 80:20, 90:10) and all offers they received (50:50, 40:60, 30:70, 20:80, 10:90).

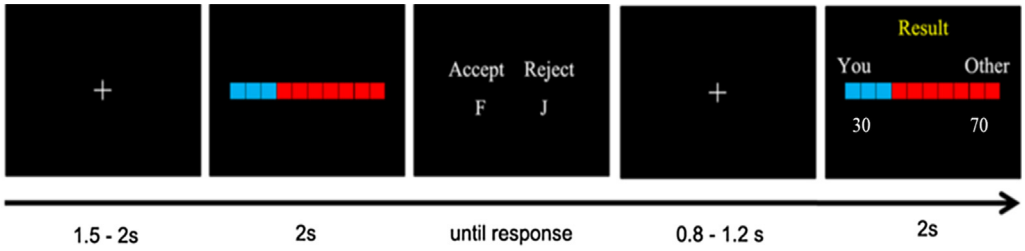

Fig. 1. Schematic depiction of a single trial setting at *Responder* stage. In this exemplar trial, the responder accepts the offer proposed by another player or a computer, thus the money is split between the two as proposed.

2.1.3.2. Anger. We assessed participants' anger toward the offer they had received immediately following their decision to it (as responders). In particular, responders answered the question: "How angry did this offer make you feel?" (1 = *not at all*, 7 = *very much*).

2.1.3.3. Altruism. We assessed participants' perceptions of altruism by asking them: "How altruistic were you in this game?" (1 = *not at all*, 7 = *very much*).

2.1.3.4. Moral judgment of fairness. We assessed whether participants regarded fairness as moral using the 4-item fairness subscale of the moral judgment items (Graham, Haidt, & Nosek, 2009). Sample items are: "If a friend wanted to cut in with me on a long line, I would feel uncomfortable because it wouldn't be fair to those behind me" and "Justice, fairness and equality are the most important requirements for a society" (1 = *strongly disagree*, 6 = *strongly agree*; $\alpha = 0.45$).

2.1.3.5. Moral outrage to unfairness. We assessed outrage over injustice or unfairness with the 10-item moral outrage scale (Montada, Schmitt, & Dalbert, 1986). Sample items are: "I feel really angry when I learn about people who are suffering from injustice" and "I feel morally outraged by social injustice" (1 = *strongly disagree*, 6 = *strongly agree*; $\alpha = 0.83$).

2.2. Results and discussion

We analyzed the data using 2 (communal narcissism: high, low) × 2 (offer: equitable, inequitable) Analyses of Variance (ANOVAs). Communal narcissism was a between-subjects factor, and offer was a within-subjects factor. (For intercorrelations among measures, see Online Supplement.)

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jrp.2018.07.003.

2.2.1. Manipulation check

A significant offer main effect indicated that proposers regarded equitable offers ($M = 3.62$, $SD = 0.70$) as fairer than inequitable ones ($M = 1.44$, $SD = 0.66$), $F(1, 79) = 638.09$, $p < .001$, $\eta_p^2 = 0.890$. Crucially, this main effect was unqualified by the Communal Narcissism × Offer interaction, $F(1, 79) = 0.06$, $p = .81$, $\eta_p^2 = 0.001$: High and low communal narcissists did not differ in their fairness perceptions of offers they made. The communal narcissism main effect was not significant, $F(1, 79) = 0.54$, $p = .46$, $\eta_p^2 = 0.007$.

A significant offer main effect also indicated that responders regarded equitable offers ($M = 3.72$, $SD = 0.70$) fairer than inequitable ones ($M = 1.48$, $SD = 0.54$), $F(1, 79) = 608.88$, $p < .001$, $\eta_p^2 = 0.885$. Importantly, this main effect was unqualified by the Communal Narcissism × Offer interaction, $F(1, 79) = 0.14$, $p = .71$, $\eta_p^2 = 0.002$: High and low communal narcissists did not differ in their fairness perceptions of offers they received. As above, the communal narcissism main effect was not significant, $F(1, 79) = 0.45$, $p = .50$, $\eta_p^2 = 0.006$.

2.2.2. Social decision-making

For proposers, we analyzed the number of equitable offers and the number of inequitable offers made. For responders, we analyzed the rejection rate of inequitable to equitable offers received.

2.2.2.1. Proposers. We tested whether high (relative to low) communal narcissists would be more likely versus equally likely to make equitable than inequitable offers. Replicating past findings (Güth & Tietz, 1990; Güth et al., 1982), the offer main effect was significant, $F(1,79) = 66.82$, $p < .001$, $\eta_p^2 = 0.466$: Proposers made more equitable ($M = 6.25$, $SD = 3.48$) than inequitable ($M = 1.60$, $SD = 2.15$) offers. This main effect was qualified by a marginal interaction, $F(1,79) = 3.31$, $p = .073$, $\eta_p^2 = 0.040$. Highs were more likely to make equitable ($M = 5.51$, $SD = 3.61$) than inequitable ($M = 1.88$, $SD = 2.16$) offers, $t(40) = 4.44$, $p < .001$, $d = 1.29$, but lows were much more likely to make equitable ($M = 7.00$, $SD = 3.21$) than inequitable offers ($M = 1.33$, $SD = 2.13$), $t(39) = 7.41$, $p < .001$, $d = 2.27$. We proceeded to view the interaction from an alternative angle, namely, by breaking it down on the basis of communal narcissism. Highs tended to make fewer equitable offers than lows, $t(79) = -1.96$, $p = .054$, $d = 0.44$, but highs and lows did not differ in the inequitable offers they made, $t(79) = 1.16$, $p = .249$, $d = 0.26$. The results indicate that communal narcissists are not fairer than their non-narcissistic counterparts, and may even be unfairer.

2.2.2.2. Responders. We examined whether high (relative to low) communal narcissists would be more likely versus equally likely to reject inequitable than equitable offers. The offer main effect was significant, $F(1, 79) = 266.91$, $p < .001$, $\eta_p^2 = 0.772$: Responders rejected more inequitable (74.2% ± 32.6%) than equitable (12.1% ± 19.4%) offers, consistent with prior findings (Güth & Tietz, 1990; Nowak et al., 2000; Thaler, 1988). Of importance, this main effect was unqualified by the interaction, $F(1, 61) = 0.59$, $p = .44$, $\eta_p^2 = 0.007$: Highs were as likely to reject inequitable ($M = 73.0\%$, $SD = 34.7\%$) than equitable ($M = 13.8\%$, $SD = 22.4\%$) offers, $t(40) = 9.99$, $p < .001$, $d = 1.55$, as lows were to reject inequitable ($M = 75.4\%$, $SD = 30.7\%$) than equitable ($M = 10.4\%$, $SD = 15.8\%$) offers, $t(39) = 13.75$, $p < .001$, $d = 2.15$. We proceeded to break down the interaction by communal narcissism. Highs and lows did not differ in the rejection of equitable offers, $t(79) = 0.79$, $p = .432$, $d = 0.21$, and inequitable offers, $t(79) = -0.34$, $p = .738$, $d = 0.06$. Finally, the communal narcissism main effect was not significant, $F(1, 79) = 0.01$, $p = .92$, $\eta_p^2 = 0.001$. Taken together, high and low communal narcissists did not differ in their propensity to reject inequitable (vs. equitable) offers.

2.2.3. Self-reports[2]

2.2.3.1. Anger. We tested if, as responders, high (compared to low) communal narcissists would be more likely versus equally likely to express anger at inequitable (than equitable) offers. The offer main effect was significant, $F(1, 79) = 62.32$, $p < .001$, $\eta_p^2 = 0.441$: Responders felt angrier at inequitable ($M = 4.27$, $SD = 1.42$) than equitable ($M = 2.88$, $SD = 1.15$) offers. Critically, this main effect was unqualified by the Communal Narcissism × Offer interaction, $F(1, 79) = 1.47$, $p = .23$, $\eta_p^2 = 0.018$: Highs were as angry at inequitable ($M = 4.29$, $SD = 1.63$) than equitable ($M = 2.68$, $SD = 1.25$) offers, $t(40) = 5.92$, $p < .001$, $d = 0.92$, as lows were angry at inequitable ($M = 4.26$, $SD = 1.19$) than equitable ($M = 3.08$, $SD = 1.01$) offers, $t(39) = 5.27$, $p < .001$, $d = 0.83$. The communal narcissism main effect was not significant, $F(1, 79) = 0.69$, $p = .41$, $\eta_p^2 = 0.009$.

2.2.3.2. Altruism. Highs ($M = 4.46$, $SD = 1.69$) reported greater state altruism than lows ($M = 3.75$, $SD = 1.30$), $F(1, 79) = 4.53$, $p = .036$, $\eta_p^2 = 0.054$. Altruism did not mediate the relation between communal narcissism and fairness of offers made (with a 5000 bootstrap re-sample), $\beta = -0.04$, $p = .72$.

2.2.3.3. Moral judgment of fairness. Highs ($M = 4.35$, $SD = 0.77$) were more likely to base their fairness judgments on morality than lows ($M = 3.96$, $SD = 0.88$), $F(1, 79) = 4.53$, $p = .036$, $\eta_p^2 = 0.054$.[3] Moral judgment on the fairness did not mediate the relation between communal narcissism and fairness of offers made (with a 5000 bootstrap re-sample), $\beta = -0.04$, $p = .73$.

2.2.3.4. Moral outrage. Highs ($M = 4.55$, $SD = 0.89$) expressed greater moral outrage than lows ($M = 4.02$, $SD = 0.75$), $F(1, 79) = 8.28$, $p = .005$, $\eta_p^2 = 0.095$. Moral outrage did not mediate the relation between communal narcissism and fairness of offers made (with a 5000 bootstrap re-sample), $\beta = 0.03$, $p = .83$.

2.3. Summary

Participants played the UG and completed several self-report measures. As proposers, high communal narcissists were not fairer than lows, and, indeed, tended to be unfairer. This behavior contrasts sharply with their self-views as saintly figures (Gebauer et al., 2012; Gebauer & Sedikides, in press-a, in press-b). More to the point, this behavior contrasts sharply with their self-reports of being altruistic in the UG, of judging fairness as an important moral value, and of being morally outraged at unfairness. As responders, high (relative to low) communal narcissists were not more likely to turn their back on unfairness. Although this behavior contrasts with their claims for fairness as a moral value and for being morally outraged at unfairness, it is consistent with them not experiencing heightened anger in comparison to low communal narcissists.

3. Study 2

One objective of Study 2 was to test the replicability of the social decision-making results (i.e., UG) of Study 1. A more important objective was to foray into the neurophysiology of communal narcissists' social decision-making. In Study 1, highs (relative to lows) did not report feeling angrier at inequitable offers. We asked whether their neurophysiological reactions align with their verbal reports and with their behavior. We explored whether they evince a larger FRN, and a larger P3, under inequitable than equitable offers.

The literature suggests that behavioral responses and P3 amplitudes are influenced not only by fairness, but also by social context. In particular, responders are more likely to reject human-proposed than computer-proposed offers (Sanfey et al., 2003; Van't Wout, Kahn, Sanfey, & Aleman, 2006; Wu et al., 2013), and to manifest a larger P3 for human-proposed than computer-proposed offers (Luo, Wu, et al., 2014). Replicability of these findings would validate our behavior and neurophysiological paradigm. Unbeknownst to participants, all offers were made by the computer in predetermined pseudorandom sequences.

3.1. Method

3.1.1. Participants

The study consisted of two sessions. In the first, we administered the Communal Narcissism Inventory to 236 Zhejiang University undergraduates ($M = 4.72$, $SD = 0.82$; $\alpha = 0.93$). The sampling requirements to achieve the desired statistical power for the interaction between communal narcissism and offer were the same as in Study 1 (Vazire, 2016).

From the 236 respondents to the Communal Narcissism Inventory, we selected the top 30% and bottom 30% scorers. Then, we randomly invited to the laboratory 31 high (24 men, 7 women; $M_{age} = 22.56$ years, $SD_{age} = 0.88$ years) and 31 low (21 men, 10 women; $M_{age} = 22.48$ years, $SD_{age} = 0.85$ years) communal narcissists. The highs ($M = 5.80$, $SD = 0.39$) and lows ($M = 3.46$, $SD = 0.59$) differed significantly on their scores, $t(60) = 18.39$, $p < .001$, $d = 4.68$.

All participants were right-handed, had normal vision (with correction), and were free of regular use of any substance that might influence the central nervous system. Also, none had a history of neurological disease. Finally, all participants signed informed consent forms and were remunerated. The Institutional Review Board of Institute of Psychology, Chinese Academy of Sciences, approved the study protocol.

3.1.2. Procedure

3.1.2.1. Ultimatum Game. We followed the same procedure as in Study 1, with some notable exceptions. Specifically, the proposer stage comprised 50 trials, with the offer distribution being the same as in Study 1 (i.e., 50:50, 60:40, 70:30, 80:20, 90:10). The responder stage comprised 300 trials in blocks of six. In each block, 20 offers were equitable (10 of 50:50, 10 of 40:60), 20 were inequitable (10 of 10:90, 10 of 20:80), and 10 were nondiagnostic (30:70). Participants were led to believe that, of the six blocks of offers, three were made by a human proposer and three by a computer proposer. We randomized the sequence of six blocks separately for each participant.

3.1.2.2. Electrophysiological recording and preprocessing. We recorded brain electrical activity at 32 scalp sites using tin electrodes mounted in an elastic cap (Brain Products), with the reference on the left and right mastoids. We recorded the vertical electrooculogram (EOG) with electrode placed above the left eye. We maintained all interelectrode impedance below 5 kΩ. We amplified the EEG and EOG using a 0.05–100 Hz bandpass, and we continuously sampled them at 500 Hz/channel for offline analysis.

We conducted the EEG analysis via the Brain Vision Analyzer software (Brain Products). We corrected the EEG on each trial for blinks and eye movements using an independent components analysis (ICA) approach. After 0.05–30 Hz band-pass digital filtering, we segmented the EEG for each trial, beginning 200 ms before the onset of offer presentation and continuing for 1000 ms. We corrected the data by subtracting the average activity of that channel during the baseline period from each sample. We excluded from further analysis any trial in which EEG voltages exceeded a threshold of ± 100 μV during the recording epoch. We constructed

[2] We report in Online Supplement analyses exploring the relation between self-reports and social decision-making via separate analyses for high and low communal narcissists.

[3] The low alpha (0.45) invites cautionary interpretation of this finding. We proceeded to conduct separate analyses for each item. The results were significant ($ps < .035$) for two items, but non-significant for the other two ($ps < .91$).

the ERP waveforms by averaging epochs of the remaining trial in each condition for each participant.

3.2. Event-related potential analysis

We determined the time windows for ERP analysis through visual inspection of grand-averaged waveforms. Accordingly, we calculated FRN amplitudes and P3 amplitudes as the mean value within the 300–400 ms and 400–700 ms window following the onset of offer presentation, respectively. We chose the electrodes at which the ERP components reached their maximum for further analysis (see below).

3.3. Results and discussion

For intercorrelations among measures, see Online Supplement.

3.3.1. Social decision-making

We analyzed the number of equitable offers and the number of inequitable offers that proposers made, and the rejection rate of inequitable to equitable offers that responders received.

3.3.1.1. Proposers. We tested whether, as proposers, highs and lows would differ in the fairness of their offers, using a 2 (communal narcissism: high, low) × 2 (offer: equitable, inequitable) ANOVA. We obtained an offer main effect: Proposers made more equitable (M = 24.35, SD = 15.16) than inequitable (M = 13.16, SD = 13.57) offers, $F(1, 60) = 11.14$, $p < .001$, $\eta_p^2 = 0.157$. Crucially, this main effect was unqualified by the interaction, $F(1, 60) = 0.05$, $p = .82$, $\eta_p^2 = 0.001$: Highs and lows did not differ in the fairness of their offers. Specifically, highs were roughly as likely to make equitable (M = 25.35, SD = 16.92) than inequitable (M = 14.94, SD = 13.98) offers, $t(30) = 2.03$, $p = .051$, $d = 0.86$, as lows were to make equitable (M = 23.35, SD = 13.38) than inequitable (M = 11.39, SD = 13.11) offers, $t(30) = 2.77$, $p = .010$, $d = 1.19$. We broke down the interaction by communal narcissism as well. Highs and lows did not differ in equitable offers, $t(60) = 0.52$, $p = .608$, $d = 0.13$, and inequitable offers, $t(60) = 1.03$, $p = .307$, $d = 0.26$, they made. The results are consistent with those of Study 1 in that communal narcissists are not fairer than non-narcissists.

3.3.1.2. Responders. We tested if, as responders, highs and lows differ in their rejections of inequitable (vs. equitable) offers. We used a 2 (communal narcissism) × 2 (offer) × 2 (proposer: human, computer) ANOVA. The first factor was between-subjects, and the last two factors were within-subjects.

The communal narcissism main effect was not significant, $F(1, 60) = 0.05$, $p = .94$, $\eta_p^2 = 0.001$. The offer main effect was significant, $F(1, 60) = 261.71$, $p < .001$, $\eta_p^2 = 0.813$: Responders rejected more inequitable (73.9% ± 30.6%) than equitable (5.5% ± 14.8%) offers. The proposer main effect was significant as well, $F(1, 60) = 18.30$, $p < .001$, $\eta_p^2 = 0.234$: Responders rejected more offers proposed by a human (44.9% ± 18.5%) than by the computer (34.4% ± 21.2%), thus replicating prior findings (Luo, Wu, et al., 2014; Sanfey et al., 2003; Van't Wout et al., 2006). We also obtained an ordinal Offer × Proposer interaction, $F(1, 60) = 15.20$, $p < .001$, $\eta_p^2 = 0.202$. Responders rejected more inequitable (82.8% ± 30.4%) than equitable (7.0% ± 17.3%) offers when proposed by a human, $t(61) = 18.16$, $p < .001$, and, to a lesser extent, rejected more inequitable (65.9% ± 38.7%) than equitable (3.9% ± 13.9%) offers when proposed by the computer, $t(61) = 12.17$, $p < .001$. The interaction, and its ordinal pattern, replicated prior findings (Luo, Wu, et al., 2014; Sanfey et al., 2003; Van't Wout et al., 2006).

Of importance, the Communal Narcissism × Offer interaction was not significant, $F(1, 60) = 0.51$, $p = .48$, $\eta_p^2 = 0.008$: Highs were as likely to reject inequitable (M = 75.2% ± 30.0%) over equitable (3.8% ± 8.0%) offers, $t(30) = 13.21$, $p < .001$, $d = 2.35$, as lows were to reject inequitable (72.6% ± 31.6%) over equitable (7.2% ± 19.3%) offers, $t(30) = 10.07$, $p < .001$, $d = 1.81$. When we broke down the interaction by communal narcissism, we found that highs and lows did not differ in the rejection rate of either equitable offers, $t(60) = -0.89$, $p = .378$, $d = 0.21$, or inequitable offers, $t(79) = 0.34$, $p = .736$, $d = 0.06$. This pattern replicates that of Study 1. No other interaction was significant, $Fs < 0.51$, $ps > .48$.

3.3.2. Event-related potential[4]

3.3.2.1. Feedback-Related Negativity. Based on visual detection on the scalp topographies, we determined the FRN amplitude to be maximal at electrode Fz (M = −1.09 μV, SD = 0.47 μV). Accordingly, we calculated the mean value of the electrodes around the Fz (i.e., Fz, F3, F4, FP1, FP2, FC1, and FC2) and entered it in a 2 (communal narcissism) × 2 (offer) × 2 (proposer) ANOVA. We obtained null results (Fig. 2): communal narcissism main effect $F(1, 60) = 0.01$, $p = .93$, $\eta_p^2 = 0.001$; offer main effect $F(1, 60) = 0.48$, $p = .49$, $\eta_p^2 = 0.008$; proposer main effect: $F(1, 60) = 0.41$, $p = .52$, $\eta_p^2 = 0.007$; all interactions, $Fs < 2.28$, $ps > .14$.

3.3.2.2. P3. On the basis of a visual inspection of scalp topographies, we determined for the P3 amplitude to be maximum at electrode Pz (M = 4.05 μV, SD = 0.39 μV). Accordingly, we entered the mean value of the electrodes around the Pz (i.e., Pz, CP1, CP2, P3, P4, O1, O2 and Oz) into a 2 (communal narcissism) × 2 (offer) × 2 (proposer) ANOVA. The communal narcissism main effect was not significant, $F(1, 60) = 0.14$, $p = .71$, $\eta_p^2 = 0.002$. However, the offer main effect was significant, $F(1, 60) = 5.25$, $p = .025$, $\eta_p^2 = 0.081$: inequitable offers (M = 3.73, SD = 2.77) elicited an enlarged P3 compared to equitable offers (M = 3.12, SD = 2.51), replicating prior findings (Gu et al., 2016; Hewig et al., 2011; Luo, Wu, et al., 2014). In this context, then, it is inequitable, not equitable, offers that bear emotional significance. The proposer main effect was also significant, $F(1, 60) = 11.23$, $p < .001$, $\eta_p^2 = 0.158$: Human-proposed offers (M = 3.77, SD = 2.70) elicited an enhanced P3 compared to computer-proposed offers (M = 3.08, SD = 2.37), replicating prior findings (Luo, Wu, et al., 2014).

Of note, the theoretically relevant Communal Narcissism × Offer interaction was significant, $F(1, 61) = 4.15$, $p = .046$, $\eta_p^2 = 0.065$ (Fig. 3). For highs, inequitable offers (M = 3.89, SD = 3.23) elicited larger P3 amplitudes than equitable offers (M = 2.73, SD = 2.57), $t(30) = 3.32$, $p = .002$, $d = 0.60$; however, for lows, inequitable (M = 3.58, SD = 2.26) and equitable (M = 3.51, SD = 2.43) offers elicited equivalent P3 amplitudes, $t(30) = 0.17$, $p = .87$, $d = 0.03$. Yet, a visual inspection of the interaction suggested that it may be driven by decreased emotional reactivity of highs in response to equitable offers (i.e., the reactions of highs to inequitable offers appeared to be similar to the reactions of lows to inequitable and equitable offers). This was not the case, though. Highs and lows differed neither in their reactions to inequitable offers, $t(60) = 0.44$, $p = .66$, nor in their reactions to equitable offers, $t(60) = 0.60$, $p = .23$. No other interaction reached significance, $Fs < .73$, $ps > .40$.

3.4. Summary

Participants engaged in an UG as proposers and responders, with the responders' EEG being recorded. We replicated the Study 1 behavioral findings. As proposers, high communal narcissists did not differ from their low counterparts in the fairness of their offers. As responders, highs were roughly as likely as lows to reject inequitable than equitable offers. The novel aspect of Study 2

[4] We report in Online Supplement analyses exploring the relation between neurophysiological reactions and social decision-making via separate analyses for high and low communal narcissists.

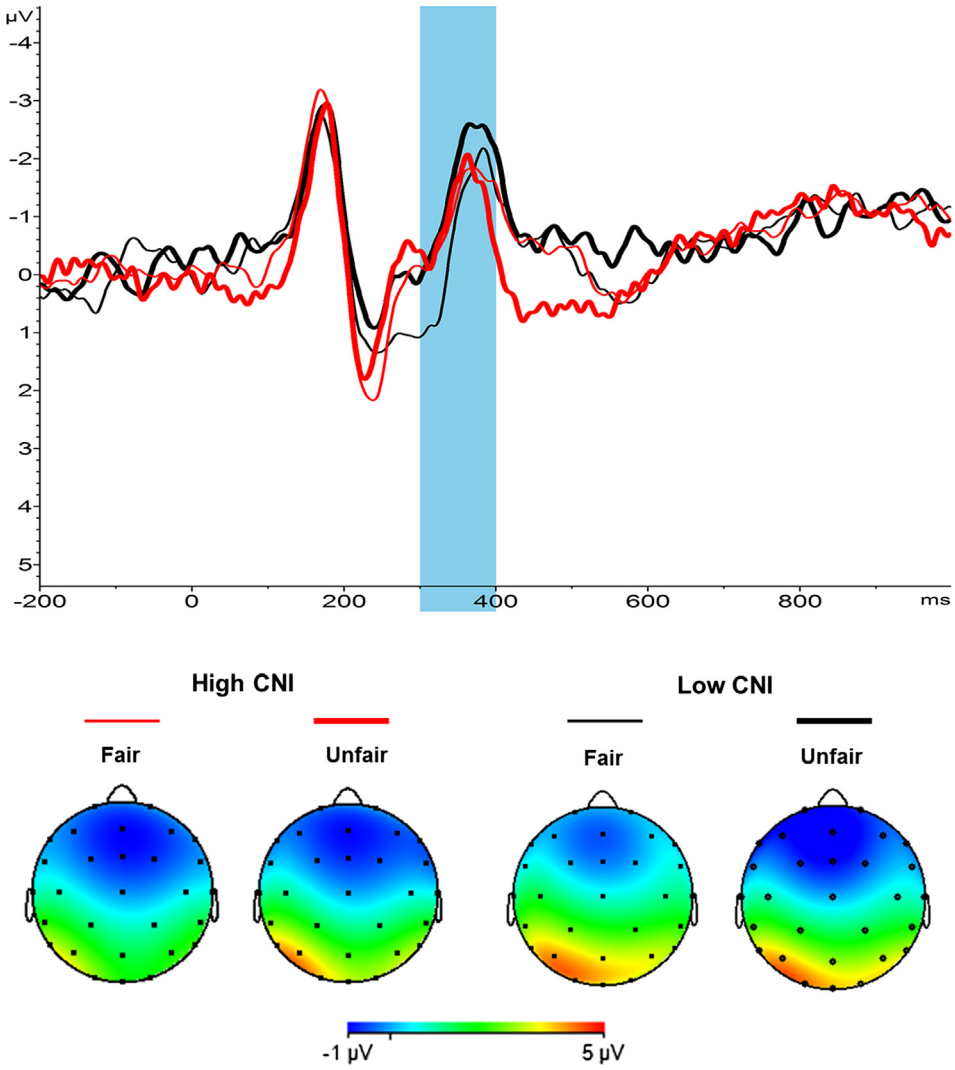

Fig. 2. Grand-average ERPs evoked by offer presentation at the Fz recording site, where the FRN component was measured. The time point 0 indicates the onset of outcome presentation. The shaded blue areas indicate the 300–400 ms time window for the calculation of the mean value of the FRN. The scalp topographies of each condition are presented beneath.

was the neurophysiological results. Highs were more emotionally sensitive to inequitable (than equitable) offers, as indicated by a larger P3. Lows, on the other hand, did not differ in their sensitivity to inequitable and equitable offers, as indicated by an equivalent P3. In regards to the FRN, we did not find that inequitable offers elicit a larger FRN than equitable ones. This was unexpected. Given that the FRN occured relatively late (300–400 ms following outcome) in our study, effects may have shifted to and manifested on P3, a phenomenon that has been observed in previous studies (Gu et al., 2016; Luo, Wu, et al., 2014). Indeed, several authors have suggested that the FRN and P3 overlap temporally, and that the two components be considered as the "FRN/P3 complex" (Foti, Weinberg, Dien, & Hajcak, 2011; Mathewson, Dywan, Snyder, Tays, & Segalowitz, 2008). Regardless, the implications of FRN for communal narcissism are unclear in the absence of a more substantive body of evidence.

4. General discussion

4.1. Overview of findings

Communal narcissists may consider themselves a boon to the world (Gebauer & Sedikides, in press-a, in press-b), but they self-enhance in the prosocial domain (Barry et al., 2016; Gebauer et al., 2012, 2018; Giacomin & Jordan, 2015; Nehrlich et al., 2018; Żemojtel-Piotrowska et al., 2016). We launched an exploratory investigation, using UG and ERP, in an effort to clarify the social decision-making of high communal narcissists and the neurophysiological correlates of it.

The results revealed discrepancies among their self-views or claims on the one hand, and their behavior or neurophysiological reactions on the other. Communal narcissists reported being more altruistic, considered fairness a particularly important moral value, and declared being more morally outraged at unfairness in the context of the UG (Study 1), thus reflecting self-motives (e.g., grandiosity, esteem, entitlement) in their prosocial domain (Gebauer & Sedikides, in press-a, in press-b; Nehrlich et al., 2018). However, their social decision-making did not match their self-views or their claims (Studies 1–2). As proposers, communal narcissists did not make more equitable offers than non-narcissists in the UG (see also Nehrlich et al., 2018); if anything, they appeared to make fewer equitable offers (Study 1). As responders, communal narcissists were not more likely to reject inequitable (than equitable) offers than non-narcissists in the UG; that is, they were not more intolerant of being treated unfairly. More importantly, communal narcissists exhibited a larger P3 amplitude to inequitable (than

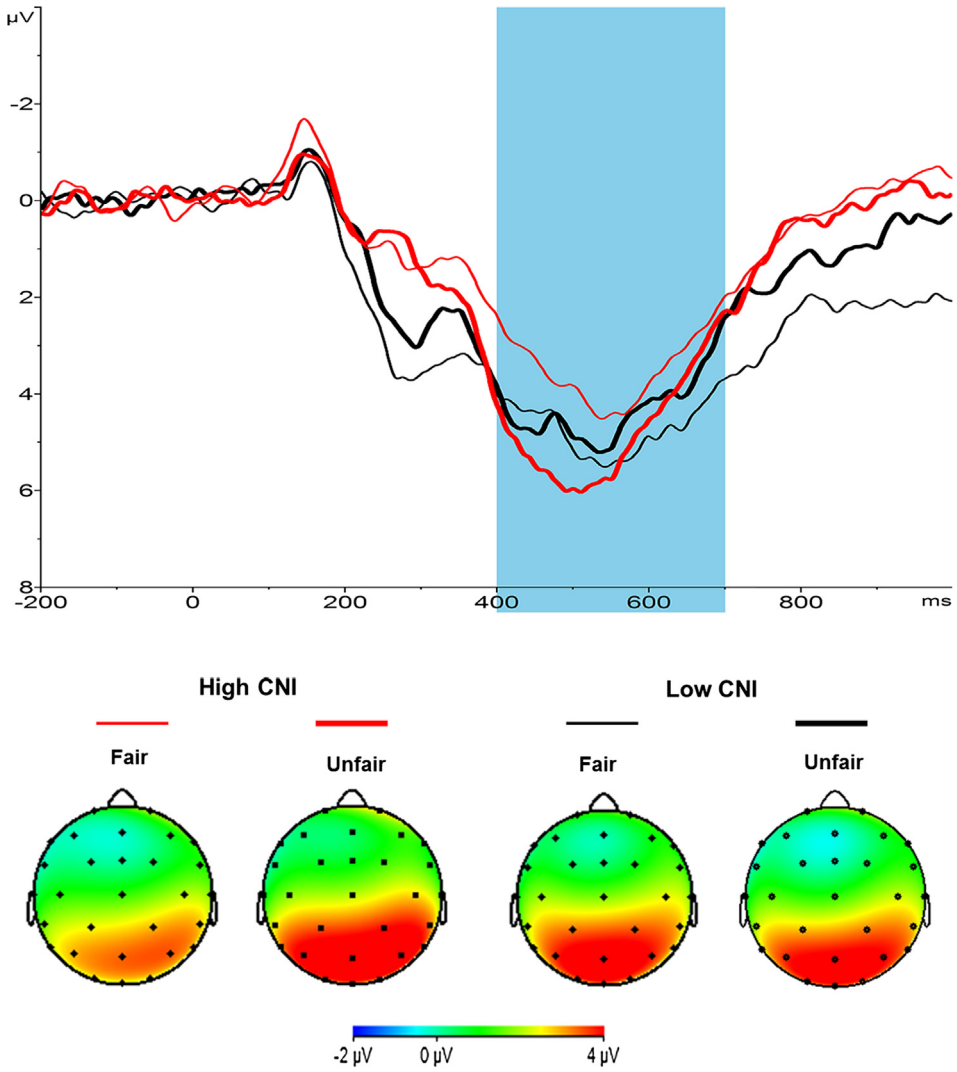

Fig. 3. Grand-average ERPs evoked by offer presentation at the Pz recording site, where the P3 component was measured. The time point 0 indicates the onset of offer presentation. The shaded blue areas indicate the 400–700 ms time window for the calculation of the mean value of the P3. The scalp topographies of each condition are presented beneath.

equitable) offers (Study 2): They were more emotionally sensitive to inequitable offers. This heightened neurophysiological reaction may be indicative of more intensified self-directed unfairness (likely underlain by self-motives). Although highs explicitly strive to maintain and promote their grandiose self-views on pro-sociality, implicitly they are more intolerant than lows to self-directed unfairness. Viewed from another vantage point, lows were not differentially sensitive to inequitable and equitable offers (i.e., P3 amplitudes were equivalent), reflecting subdued self-motives.

4.2. Implications

Our research links communal narcissism with social decision-making and fairness. Although highs are particularly likely to envelop fairness in morality, report greater moral outrage, and assert altruism in the UG, they make social decisions that are not different from those of lows. As we noted above, high communal narcissists manifested increased emotional sensitivity to inequitable (than equitable) offers, a finding that points to discrepancies among self-views, overt behavior, and neurophysiological reactions. Future research may consider the replicability of the results with different social dilemma games. For example, communal narcissists may be more emotionally sensitive to unfairness only when it is self-directed (as was presently the case). Also, future research may examine whether our results replicated with social dilemma games where communal narcissists are the third party or neutral observers. Do their neurophysiological reactions mimic the ones we currently obtained?

In Study 1, highs did not express more anger at inequitable (than equitable) offers compared to lows. Albeit preliminary, the heightened emotional sensitivity to unfairness in Study 2 suggests an explicit-implicit dissociation among communal narcissists. Highs may not express anger explicitly, but they may still be vulnerable implicitly. That is, their emotional sensitivity to inequitable offers may be a marker of reactivity to perceived interpersonal threat. Indeed, prior studies have shown that inequitable offers are perceived as a social threat (Gu et al., 2016), and that threat in the form of social exclusion manifests itself as hypersensitivity in brain systems (i.e., the social pain network: anterior insula and anterior cingulate cortex) in the absence of self-reported distress among agentic narcissists (Cascio, Konrath, & Falk, 2015). Future work will do well to test the replicability of the neurophysiological findings and also extend them to paradigms such as Cyberball (i.e., the social exclusion one). Communal narcissists may not express overt aggression against the perpetrator in the face of social exclusion (as, for example, agentic

narcissists do—see Sedikides & Campbell, 2017, for a review), but, in apparent effort to regulate their self-ascribed magnanimity or benevolence, may evince greater emotional sensitivity detected in brain systems than their low counterparts.

Although we did not assess agentic narcissism, our findings arguably help to delineate boundaries between communal and agentic narcissism. High (compared to low) agentics show lower generosity and greater punitiveness, with the latter being mediated by anger (Böckler, Sharifi, Kanske, Dziobek, & Singer, 2017). Also, high agentics are less likely to acquiesce and more likely to engage in revenge against the person who treated them unfairly (Brunell & Davis, 2016), and, if they happen to accumulate economic gain in negotiations, do so at interpersonal loss (Park, Ferrero, Colvin, & Carney, 2013). High (compared to low) communal narcissists do not propose or reject more inequitable offers, do not report heightened anger at inequitable offers, and, despite their neurophysiological reactions, may manage to regulate their overt behavior in a way that is prosocially acceptable.

4.3. Limitations

Our main conclusions (i.e., highs are neither fairer, nor less tolerant to unfairness, than lows) are based on null results. However, we had sufficient power to detect a medium effect size for the interaction effects. In addition, we replicated key findings in the literature: Proposers made more equitable than inequitable offers, responders rejected more inequitable than equitable offers, and responders rejected more human-generated than computer-generated offers. Nonetheless, the validity of our main conclusions will be strengthened by more powerful designs.

Moreover, the generalizability of our findings is constrained. We tested university students and, as mentioned above, used a specific version of the UG. Also, our measure of moral judgments of fairness had low internal consistency. Future research will need to address these issues.

Lastly, we note the selection of high versus low communal narcissists. Given the laboriousness of neurophysiological studies, researchers often resort to arbitrary cut-off points in dichotomizing the personality variable of interest (Li & Yang, 2013; Li et al., 2012; Luo, Wu, et al., 2014). This practice has been defended on pragmatic and psychometric grounds (Asendorpf et al., 2013). Yet, median splits can be problematic due to arbitrary grouping criteria that vary across studies. This is especially so when median splits are used in conjunction with small samples, because the distribution of participants high versus low on the relevant personality variable runs the risk of being uneven across the two groupings. Given that we used relatively small samples, we attempted to address this potential problem by randomly selecting participants within each grouping, thus aiming for maximal evenness. Indeed, the highs as a group evinced much greater scores on the Communal Narcissism Inventory than the lows. Regardless, follow-up research will do well, resources permitting, to use the full range of scores on the Communal Narcissism Inventory.

5. Coda

Communal narcissism, as a construct, is coming of age. The current research advanced understanding of it. High communal narcissists are not fairer than their low counterparts in their social decision-making, although they believe that they are. Further, high communal narcissists manifest heightened emotional sensitivity to unfairness, as indicated by a neurophysiological index. We hope that these findings spark interest in clarifying the behavioral, neurophysiological, and also brain responses of communal narcissists as juxtaposed by their self-views and claims.

Declaration of interest

None.

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