Greenwash yourself: The relationship between communal and agentic narcissism and pro-environmental behavior

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ABSTRACT

People’s pro-environmental behavior (PEB) can reflect their concern for the environment, but it can also have selfish reasons. The present study (N = 261) addresses the relationship between communal and agentic narcissism on the one hand, and altruistic and egoistic PEB on the other. To assess participant’s PEB, a general self-report questionnaire and a diary approach were employed. For the general questionnaire, linear regression models revealed a significant positive correlation between communal narcissism and egoistic PEB. For the diary data, multilevel models showed that communal narcissism was positively linked to both egoistic and altruistic PEB, whereas agentic narcissism and altruistic PEB were negatively related. We discuss possible reasons for why results of the general and multilevel diary approach differ and how leveraging narcissism could be used to enhance PEB.

1. Introduction

It is undeniable that climate change is real, human-made, and one of the most challenging issues of humankind (IPBES, 2019). Although more and more people are aware of the need to act to prevent further impacts of climate crisis, it is challenging to turn good intentions into action. In fact, pro-environmental attitudes only explain around 20% of pro-environmental behavior (Bohlen, Schlegelmilch, & Diamantopoulos, 1993). This attitude-behavior-gap has been widely acknowledged (Baumgartner, 2005; Fuhrer, 1995; van Liere & Dunlap, 1980), suggesting that there are further determinants of ‘green’ behavior. Which circumstances and psychological factors enhance or diminish pro-environmental behavior (PEB) has been an important research question.

Among the investigated factors have been personality traits (e.g., Markowitz, Goldberg, Ashton, & Lee, 2012) and personal values (e.g., Pinto, Nique, da Silva Ahaña, & Herter, 2011). Importantly, a theoretical duality of personal values evolved, with social values in the aim of self-transcendence on the one side of the continuum and self-enhancement values on the other (Pinto, Nique, Ahaña, & Herter, 2011; Schwartz, 1994). PEB can reflect both of these motives. The first means to ‘go green’ for altruistic reasons. For example, a person chooses a vegetarian nutrition due to its impact on the environment. In contrast, egoistic PEB is driven by the ultimate desire to increase one’s own welfare. Here, we focus on PEB motivated by a desire to impress others by making a statement about one’s environmental awareness. For example, a meat eater chooses a vegetarian meal so that she/he is positively perceived by others.

People differ in the extent to which their behavior is affected by how they believe they are seen by others. Especially narcissists are aware of their impression on others in terms of self-promotion (e.g., Hart, Adams, & Burton, 2016). In fact, previous research has established a link between self-enhancing PEB and narcissism (e.g., Naderi, 2018; Naderi & Strutton, 2015). Recently, the agency-communion model has been proposed (Gebauer, Sedikides, Verplanken, & Maio, 2012), according to which narcissism may manifest in terms of agentic or communal means. In the present study, we examined the associations between egoistic and altruistic PEB on the one hand and agentic and communal narcissism on the other. We employed two methodologies: a self-report scale, assessing participants’ general daily PEB, and diary reports of participant’s actual behavior.

Based on the review of the literature we summarize below, we expected that agentic narcissism would be negatively associated with both measures of altruistic PEB. In contrast, agentic narcissism should be positively associated with the general measure of egoistic PEB, but negatively associated with the diary reports of egoistic PEB. For communal narcissism, we predicted positive associations with the general measures of both egoistic and altruistic PEB, but there should be no
significant associations with the corresponding diary reports. **Narcissism.** Narcissism is defined as a pattern of grandiosity, self-importance, and self-focus (American Psychiatric Association, 2013), related to heightened self-interest (Pulver, 1970). Importantly, there are different types of narcissists. For example, one can differentiate between vulnerable and grandiose narcissism (American Psychiatric Association, 2013). Whereas vulnerable narcissists tend to be introverted and reacting particularly sensitively to personal criticisms, grandiose narcissists tend to be extroverted and display extraordinary self-esteem (Rohmann, Neumann, Herner, & Bierhoff, 2012). Moreover, an agentic and a communal type can specify grandiose narcissism. Both are located on a sub-pathological continuum; that is, individual manifestations of agentic and communal narcissism are personality traits instead of clinical disorders. Nehrlich and colleagues (Nehrlich, Gebauer, Sedikides, & Schoel, 2019) explained the agentic narcissism type in relation to overestimated intelligence, creativity, and professional skills, whereas communal narcissism characterizes an overestimation of pro-social traits such as agreeableness, prosocial behavior, fairness, and cooperation skills. In general, communal narcissists claim to be ‘kind’ to ‘give’, whereas agentic narcissists like to show off what they have (Malkin, 2015; Naderi, 2018). The role of narcissism in daily PEB is not yet clear. By intuition, one might assume that narcissistic values, such as individualism, self-enhancement, and self-promotion, hinder people to behave in a pro-environmental manner. However, as reasoned below, narcissism could be also positively related to PEB.

**Narcissism as a psychological factor influencing PEB.** The situation of current climate change can be seen as a specific type of socio economical dilemma (Ernst, 1997), as the environment is a shared common good and therefore of ‘communal’ value. An individual’s behavior might harm the interest of the common, when acting in self-interest. Narcissists might therefore neglect the wellbeing of society and nature for egoistic reasons. As especially agentic narcissists tend to focus on their own well-being to the detriment of shared commons in socio-economic dilemmas (Campbell, Bush, Brunell, & Shelton, 2005), they might simply not care about the environment (Naderi & Strutton, 2014).

However, research has shown that ‘green’ purchase decisions do not always reflect a person’s pro-environmental attitude, but often are driven by motives that seem to be unrelated to the extent to which this person is concerned about the environment. One of these motives is self-enhancement. For example, Griskevicius and colleagues (Griskevicius, Tybur, & van den Bergh, 2010) showed that participants that were primed by a story focusing on status were more likely to buy a pro-environmental product (as compared to participants in a control condition). This effect was especially pronounced when the ecological product was more expensive than an alternative product and the purchase highly visible. The authors concluded that how one might be perceived by others could be a central factor influencing PEB. Some researchers even argued that the act of green consumption might be positioned as high-status on purpose, to improve marketing success (Ottman, Stafford, & Hartman, 2006).

Subsequent research (Naderi & Strutton, 2015) suggests that especially people with narcissistic tendencies are influenced by status values. Narcissistic participants made similar purchase decisions as status-primed participants did in the study by Griskevicius et al. (2010). This suggests that trait narcissism chronically makes status-thoughts salient. In fact, narcissism is known to be associated with emphasizing a symbol of their status through the rational route of an object (Sedikides, Cikle, & Hart, 2011). If pro-ecological products are more expensive, narcissistic people could possibly favor them when they believe they will be evaluated by others. In that case, the motive underlying green behavior is narcissistic self-interest, rather than reflecting a pro-environmental attitude. Narcissists want to show off their ability to afford higher prices for pro-ecological products (Naderi & Strutton, 2015).

In previous research, agentic narcissism was measured broadly, whereas the communal type was mainly neglected. Agentic narcissism was seen as ‘normal’ narcissism by Naderi and Strutton (2014), who showed that this type of narcissist “do not intrinsically value green behavior or its potential societal benefits” (Naderi & Strutton, 2014, p. 375). Importantly, their pro-environmental purchase behavior could be enhanced to the same level as the behavior of their non-narcissistic counterparts, by increasing the product attractiveness, changing from private to public purchasing setting, or an increasing price of product, reflecting higher status. It was concluded that pro-environmental purchase behavior of narcissists could be enhanced by the visibility of status. Further, Naderi (2018) investigated the relationship between communal narcissism and PEB. Communal narcissists claimed to be ‘nice’ and therefore ‘green’. In reality, they did not behave in a pro-environmental manner, as observations of fictive consumer decisions showed.

Nehrlich et al. (2019) detected similar differences between self-reports and behavior measures. Whereas communal narcissists claimed to be extremely prosocial, their behavior did not correspond to this self-description. These findings illustrate that a distinction between objective and subjective behavior is needed when investigating narcissism and PEB. In this case, the attitude-behavior gap probably reflects self-interest rather than altruistic motivation. However, communal and agentic narcissism effects on daily ‘green’ behavior such as recycling, dealing with energy, and water resources, as well as travel or nutrition habits are yet to be examined.

Importantly, daily PEB has so far been primarily assessed via general self-report questions concerning an unspecified long period of time. Such methodology is problematic because people typically tend to align attitude and behavior when questions are phrased generally (Bohlen et al., 1993). Results of a meta-analysis (Kormos & Gifford, 2014) suggest an overlap of self-reported behavioral intentions and actual PEB of only 20%, primarily due to recall biases and subjectivity in self-reports. In some studies (e.g., Naderi, 2018), concrete behavior was operationalized through hypothetical consumer decisions or the self-reported willingness to pay or donate. Moreover, it is especially “our daily routine activities [that] appear to have catastrophic consequences that should be addressed” for environmental reasons (Quimby & Angeline, 2011, p. 3). In fact, household behaviors, for example, can save an estimated seven percent of the total American national carbon emissions (Dietz, Gardner, Gilligan, Stern, & VanDenbergh, 2009). For these reasons, we deemed it important to assess participant’s actual daily PEB.

**The present investigation.** The aim of the present study was to examine the relationship between communal and agentic narcissism and PEB for altruistic and egoistic motives. We also addressed whether PEB for egoistic or altruistic reasons would show similar relations with an individual’s level of narcissism when PEB is assessed either generally or specifically. Therefore, we used the daily reconstructing method (DRM), which can reduce recall bias of general measures and has additional advantages compared to experience sampling methods or field observations (Kaheman, Krueger, Schkade, Schwarz, & Stone, 2004). For instance, DRM offers less burden for participants who do not want to be disturbed throughout the day. Additionally, no observer effects occur. We obtained up to 14 diary entries per participant, as well as responses to a general measure of PEB. The comparison of data across general self-reports and DRM may illuminate why previous findings of objective and subjective PEB measures are inconclusive (Nehrlich et al., 2019).

We assumed communal narcissism to positively correlate with general measures of both altruistic and egoistic PEB. Communal narcissists are expected to overestimate communal values, such as PEB, what their actions, however, often do not verify (Naderi, 2018). Therefore, we assume that communal narcissism might not correlate with any PEB reported in the DRM. On the other hand, agentic narcissism is expected to positively correlate with egoistic PEB when measured generally. Agentic narcissists might use the possibility to enhance their self by social status-seeking through egoistic PEB. However, agentic narcissism should negatively relate to altruistic PEB both generally and in daily life, as highly agentic narcissistic people should not value PEB or...
prioritize nature as a shared resource as people do with lower scores on agentic narcissism (Campbell et al., 2005; Naderi & Strutton, 2014). Agentic narcissism is also expected to negatively correlate with egoistic PEB, because agentic narcissists are less concerned about social approval in terms of communal values and hence PEB (Gebauer et al., 2012). Concretely, we pre-registered the following hypotheses (https://aspredicted.org/9369q.pdf).

Concerning a subjective, general assessment of PEB, we anticipated:

I) a negative correlation between agentic narcissism and altruistic PEB,
II) a positive correlation between agentic narcissism and egoistic PEB.
III) a positive correlation between communal narcissism and altruistic PEB.
IV) a positive correlation between communal narcissism and egoistic PEB.

Concerning the daily reconstruction method, we anticipated:

V) a negative correlation between agentic narcissism and altruistic PEB,
VI) a negative correlation between communal narcissism and egoistic PEB.
VII) no correlation between communal narcissism and altruistic PEB.
VIII) no correlation between communal narcissism and egoistic PEB.

2. Method

Two-hundred and sixty-five individuals took part in an online study. The required number of participants was calculated a priori in an analysis of power by using the program “G-Power” (Erdfelder, Faul, & Buchner, 1996). It determined a target sample size of 240 participants with an expected correlation coefficient of \( r = 0.18 \), \( \beta = 0.20 \) and \( \alpha \) (two-tailed) = 0.05, based on reported correlation coefficients of pro-social behavior and narcissism in previous research (Nehrlich et al., 2019).

Four individuals were excluded because they failed to produce a consistent code to track diaries. No participant was excluded because of an anomaly in observed variables by the criterion of exceeding the mean by three standard deviations. The valid cases included 204 female participants, 54 males and three individuals who stated another gender. The total number of diaries assessed was \( N = 2728 \). On average, participants completed 10.31 (SD = 3.86) out of 14 diaries. Each of them was structured equally. An introduction including examples for egoistic and altruistic PEB was given first. Then we asked participants for the frequency of both types of behaviors during the past day. In addition, participants described these behaviors with keywords. We assessed frequencies of each type of PEB per day and person. Only adequately described behaviors were counted. On average, participants reported 0.34 (SD = 0.58) egoistic and 2.71 (SD = 1.67) altruistic PEB behaviors per day. All entries were tracked anonymously using an individual code.

Finally, participants had the opportunity to give feedback. They were also asked for possible changes in behavior due to their participation and the correctness of the answers given.

3. Results

**Descriptive analyses.** Data were analyzed using the open source

| Questionnaire | Items | Example Item | Scale |
|---------------|-------|--------------|-------|
| Political Attitude | 1 | “How would you describe your political attitude?” | Slider: 1 to 101 (political left to right) |
| Self-Esteem (Collani & Herzberg, 2003; Rosenberg, 1965; German version from) | 10 | “I found a positive attitude about myself.” | 4-point-Likert-Scale: 0 (not at all) to 3 (fully correct) |
| Communal Narcissism Inventory (CNI; Gebauer et al., 2012) | 16 | “I am an excellent listener” | 7-point-Likert-Scale: 1 (absolutely wrong) to 7 (absolutely right) |
| Narcissistic Personality Inventory-16 (NPI-16; Ames et al., 2005; German Version: Schütz et al., 2004) | 16 | “I don’t want to stand out in the crowd” | Forced Choice format between two counterparts |
| Belief in human-made climate change | 1 | “How strong is your belief in human-made climate change?” | Slider ranged from 1 to 101 (not believe at all to totally believe) |
| New Environmental Paradigm Scale (NEP; Schleyer-Lindenmann et al., 2018) | 15 | “Humans are born to rule over nature” | 5-point-Likert-Scale: 1 (don’t agree at all) to 5 (fully agree) |
| questionnaire on general egoistic (13 items) and altruistic (9 items) PEB | 22 | “I set a good example for others in terms of environmental awareness.” | 5-point-Likert-Scale: 1 (not at all) to 5 (always/fully agree) |
calculated by summing up the values of the given answers in a forced choice format \( (1 = \text{less narcissistic alternative chosen}, \ 2 = \text{narcissistic alternative chosen}; \ a = 0.69, 95\% CI [0.63, 0.74]) \). Concerning the other scales, arithmetic means were calculated. Reliability of the scales was sufficient (CNI \( \alpha = 0.89 \ CI_{95\%} [0.87, 0.89] \), NPE \( \alpha = 0.71 \ CI_{95\%} [0.66, 0.76] \), self-esteem \( \alpha = 0.89 \ CI_{95\%} [0.87, 0.91] \), NPE \( \alpha = 0.71 \ CI_{95\%} [0.66, 0.76] \), egoistic PEB general \( \alpha = 0.79 \ CI_{95\%} [0.75, 0.82] \), altruistic PEB general \( \alpha = 0.69 \ CI_{95\%} [0.63, 0.74] \), egoistic PEB diary \( \alpha = 0.91 \ CI_{95\%} [0.89, 0.93] \), altruistic PEB diary \( \alpha = 0.93 \ CI_{95\%} [0.92, 0.94] \)). To test the assumption of normal distribution, Shapiro Wilk tests were calculated. The following variables did not fulfill the assumption: political attitude, NPI score, self-esteem, belief in climate change, NPE mean, and age. A nonparametric Spearman rho correlation test was used for these cases. Table 2 presents the correlations matrix for all observed variables, as well as means and standard deviations.

For validation reasons, the narcissism measures were correlated with the self-esteem scale. As theory suggests (Rohmann et al., 2012), the NPI score showed a significant positive correlation with self-esteem (\( r = 0.30, p = 0.001 \)). However, the correlation with the CNI mean was only marginally significant (\( r = 0.16, p = 0.087 \)). All covariates correlated with both types of PEB (egoistic and altruistic) in the general assessment and were therefore included in the following analyses.

Results showed that 74.7% (\( N = 148 \)) of the participants who filled out a feedback questionnaire in the end (\( N = 198 \)) stated that their behavior did not change due to their participation. Another 23.7% (\( N = 47 \)) reported to behave more environmentally aware throughout the 14 days of the survey. Overall, 84.8% (\( N = 168 \)) stated that all given answers adequately reflect the reality of their real PEB. 12.1% (\( N = 24 \)) stated a more negative picture of their behavior in the survey compared to reality, whereas only 2.5% (\( N = 5 \)) stated that they claimed a more positive picture in the survey, compared to how they actually behaved.

To investigate the accordance of diary and general PEB measurements, intraclass correlations (ICCs) were calculated by comparing variance estimations in multilevel and regression models. This method, using R (R Core Team, 2019), was described by Hoyt and Kenny (2013). For egoistic and altruistic PEB, ICC was lower than 0.01 when comparing both methods, meaning that less than 1% of the variance in daily reconstructions can be explained by the general assessment. However, beta coefficients of a multilevel model showed a significant positive relationship between generally and daily assessed egoistic PEB (\( b = 0.07 \ CI_{95\%} [0.04, 0.10], t(2685) = 4.27, p < 0.001 \)), as well as between both measurements of altruistic PEB (\( b = 0.65 \ CI_{95\%} [0.53, 0.78], t(2685) = 10.16, p < 0.001 \)). Whereas general altruistic PEB and daily altruistic PEB were unrelated, a significant positive relation of general egoistic PEB and daily altruistic PEB was found (\( b = 0.38 \ CI_{95\%} [0.53, 0.78], t(2685) = 8.03, p < 0.001 \)).

ICCs were also calculated to compare the explained variance of PEB by pro-environmental attitude (NPE mean), in order to investigate the attitude-behavior gap. Less than 1% of variance of the egoistic and altruistic PEB reported in diaries (DRM) could be explained by environmental attitude (ICC < 0.01). This indicates a large attitude-behavior-gap. For the general assessment of PEB, this gap was smaller with 6.3% explained variance of general egoistic and 7.8% explained variance of general altruistic PEB by pro-environmental attitude (NPE mean).

**General PEB questionnaire.** To examine if communal and/or agentic narcissism predict general altruistic and egoistic PEB, multiple linear models were conducted including all covariates (age, gender, political attitude, belief in climate change, NPE mean, CNI and NPI, respectively).

Contrary to hypothesis I, stating a negative correlation between agentic narcissism and altruistic PEB, the Spearman’s rank correlation was not significant (Table 2). In addition, a linear regression revealed no significant relationship (\( b = -0.02, t(253) = -1.34, p = .182 \)) when all covariates were taken into consideration. Only the NPE mean (corresponding pro-environmental attitude) had a significant influence as a

| Table 2. Zero-order correlations among all variables (\( N = 261 \)). |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                | 1. CNI (mean) | 2. CNI (score) | 3. NPI (score) | 4. NPI (mean) | 5. Altruistic PEB general | 6. Altruistic PEB diary | 7. NEP (mean) | 8. Belief in climate change | 9. Age | 10. Political | 11. Attitude | 12. NPI (score) | 13. NPI (mean) |
| M              | 20.11        | 2.83           | 2.34           | 2.90           | 1.47             | 0.65            | 3.24           | 3.04           | 5.99           | 3.04           | 5.55           | 2.83           | 20.11           |
| SD             | 2.83         | 0.50           | 0.22           | 0.65           | 0.65             | 0.65            | 0.50           | 0.22           | 0.65           | 0.65           | 0.65           | 0.22           | 0.65           |
| r              | -0.02        | 0.42           | 0.33**         | 0.30**         | 0.47**           | 0.33**          | 0.45**         | 0.22**         | 0.44**         | 0.44**         | 0.44**         | 0.53**         | 0.22**         |
| r (b)          | -0.23        | 0.33**         | 0.33**         | 0.30**         | 0.47**           | 0.33**          | 0.45**         | 0.22**         | 0.44**         | 0.44**         | 0.44**         | 0.53**         | 0.22**         |
| r (p)          | -0.28        | 0.36**         | 0.36**         | 0.33**         | 0.47**           | 0.33**          | 0.45**         | 0.22**         | 0.44**         | 0.44**         | 0.44**         | 0.53**         | 0.22**         |

Note. Pro-Environmental Behavior (PEB). Communal Narcissism Inventory (CNI). 16 Item NPI: Narcissistic Personality Inventory (NPI). New Environmental Paradigm (NPE) scale, measuring pro-environmental attitude, \( r = \text{Spearman’s rank correlation rho}. \) \( b = \text{beta coefficient in multilevel linear model}. \) Brackets indicate 95% confidence intervals. Level of significance: * \( p < 0.05 \), ** \( p < 0.01 \), *** \( p < 0.001 \).
Contrary to hypothesis II, the Spearman’s rank correlation of the NPI mean and egoistic PEB did not reveal a significant effect (Table 2). A multiple linear regression showed no relation between agentic narcissism and egoistic PEB (β = 0.25, t(253) = 0.86, p = .383). Communal narcissism, age, political attitude, belief in climate change, and gender significantly influenced the relation between NPI mean and egoistic PEB (CNI mean: β = -0.12, t(253) = 2.81, p < .05; age: β = 0.01, t(253) = 2.69, p < .05; political attitude: β = -0.01, t(253) = -2.91, p < .05; belief in climate change: β = 0.01, t(253) = 3.67, p < .001; gender male vs. female: β = -0.23, t(253) = -2.48, p < .05).

Contrary to hypothesis III, a Pearson’s product moment correlation showed no significant relation of communal narcissism and altruistic PEB (Table 2), neither did a multiple linear regression (β = 0.04, t(253) = 1.24, p = .217). Pro-environmental attitude was the only significant covariate (NEP mean: β = -0.25, t(253) = 2.81, p < .05).

A Pearson’s product moment correlation revealed a significant positive correlation of communal narcissism and egoistic PEB (r = 0.20, p < .05; Table 2), regarding hypothesis IV. In a linear regression model, the relationship remained significant (β = 0.12, t(253) = 2.81, p < .005). Furthermore, there was a significant influence of gender, age, political attitude, and belief in climate change as covariates (gender male vs. female: β = -0.23, t(253) = -2.48, p < .05; age: β = 0.01, t(253) = 2.69, p < .05; political attitude: β = -0.01, t(253) = -2.91, p < .05; belief in climate change: β = 0.01, t(253) = 3.67, p < .001).

Daily reconstruction. To find the most efficient model for hypotheses V to VIII, different multilevel models were conducted. As before, the covariates age, gender, political attitude, belief in climate change, environmental attitude (NEP mean), as well as NPI score or CNI mean, respectively, were included. We compared possible models for each hypothesis by their multiplied log-likelihood (-2LL) using the full maximum likelihood estimation of the models. On top of the resulting level of significance, Bayesian-Information-Criterions (BICs) were compared to find the best model fit. For all models, varying slopes for individuals were assumed to adjust an efficient model. Results are reported including beta regression coefficients (β), approximate 95% confidence intervals (in brackets), significance levels (two-sided α = 0.05) and (t(df))-values. By this approach, preliminary assumptions of relevant covariates could be used to find the best fitting model.

To examine hypothesis V, a multilevel model with two additional predictors (age and CNI-mean) yielded the best fit, compared to every other model including other combinations of covariates ($X^2(6) = 13.37$, $p < .01$; $BIC = 10421.93$). Agentic narcissism negatively correlated with altruistic PEB ($b = -0.04$ [-0.06, -0.01], t(2683) = -2.96, $p < .05$). Fig. 1 illustrates this relation.

Concerning hypothesis VI, a multilevel model including gender and the CNI mean as additional predictors yielded the best fit ($X^2(7) = 5.41$, $p < .05$, $BIC = 4722.81$). A significant main effect of gender was found concerning the relation between agentic narcissism (NPI score) and egoistic PEB ($r = -0.46$, t(2679) = -5.30, p < .001). There was a significant positive correlation of NPI and egoistic PEB in diaries for men ($b = 0.04$ [0.02, 0.05], t(533) = 4.94, $p < .001$), but no significant correlation for women ($b = -0.01$ [-0.02, 0.00], t(2104) = -1.17, $p = .242$; Fig. 2).

Investigating hypothesis VII, a multilevel model regarding age as an additional predictor yielded the best fit ($X^2(5) = 14.09$, $p < .01$; $BIC = 10422.80$). A positive correlation of communal narcissism and altruistic PEB was found ($b = 0.08$ [0.01, 0.15], t(2684) = 2.30, $p < .05$). Fig. 3 illustrates this relation.

A multilevel model to predict egoistic PEB from communal narcissism (hypothesis VIII) was conducted using gender as an additional predictor. This model yielded the best fit, compared to models including any other possible combination of predictors ($X^2(6) = 29.91$, $p < .001$; $BIC = 4710.54$). Communal narcissism positively correlated with egoistic PEB, $b = 0.04$ [0.02, 0.06], t(2683) = 3.25, $p < .05$ (Fig. 4.). The influence of gender as a covariate was also significant, with male participants reporting less egoistic PEB than female participants ($b = -0.15$ [-0.20, -0.09], t(2683) = -5.33, $p < .001$). There was no significant interaction between gender and communal narcissism.

4. Discussion

The current climate crisis requires pro-environmental changes in our daily behavior. Especially changes on an individual level have the potential to considerably reduce greenhouse gas emissions and to therefore prevent further impacts of climate change (Vandenbergh, Barkenbus, & Gilligan, 2007). Based on previous research (Griskevicius et al., 2010; Naderi, 2018), a comparison of agentic and communal narcissism in the context of general and daily PEB was the aim of the present study. Two
types of underlying goals of PEB were considered, namely, altruistic and egoistic, and we employed two different ways to measure participant’s PEB. In line with our reasoning, the results of the general assessment and the daily reconstruction of PEB were associated in different ways with the two types of narcissism.

**Agentic narcissism and altruistic PEB.** Although we expected a negative correlation of agentic narcissism and altruistic PEB based on a general measure, a multiple linear regression did not reveal a significant effect. In contrast, in diary reports, agentic narcissists indeed cared less: as predicted, agentic narcissism and altruistic PEB were negatively related. Narcissists behaved less environmentally friendly for altruistic reasons than others, as they “do not intrinsically value green behavior or its potential societal benefits” (Naderi & Strutton, 2014, p. 375).

Although the measures of general and diary PEB were positively correlated, it appears to be important to differentiate between subjective and objective measures of PEB in that only the latter was significantly related to the participant’s level of agentic narcissism.

**Agentic narcissism and egoistic PEB.** For the relation between agentic narcissism and egoistic daily PEB, we expected a positive correlation, but there was only a positive trend in the general measure. In daily reconstructions, we expected a negative correlation, as PEB requires self-sacrifice and agentic narcissists are less concerned about social approval in terms of its communal values (Gebauer et al., 2012). However, there was no significant correlation of agentic narcissism and egoistic PEB in diaries. Notably, one could have also predicted a positive relationship between agentic narcissism and egoistic PEB. Agentic narcissists are characterized by focusing on maximizing their own interest. Because egoistic PEB has self-directed benefits, it should have a particular appeal for agentic narcissists. Indeed, agentic narcissism even enhanced egoistic daily PEB for men who typically show higher levels of agentic narcissism compared to women (Gebauer et al., 2012).

**Communal narcissism and altruistic PEB.** We expected a positive relation of communal narcissism and altruistic PEB in general measures, but no significant relation was found (contradicting findings of Naderi, 2018). This might be due to the different way how PEB was measured, as Naderi’s work (2018) investigated consumers’ fictive pro-environmental purchase decisions and how they were associated with status, whereas we assessed daily altruistic PEB. In contrast, in daily reconstructions, although we expected no meaningful correlation between communal narcissism and altruistic PEB, a significant positive relation was found. One possible explanation is that communal narcissists overestimated their altruistic PEB in diaries. Self-promoting memory biases, consciously or unconsciously, might have accumulated over the 14-day assessment. At least, it is known that communal narcissists overestimate their self in communal values (Naderi, 2018; Nehrlich et al., 2019). The close link between communal narcissism and self-enhancement in terms of communal values might therefore have a biased impact on the present findings. In contrast, for agentic narcissists, for whom communal values are of less importance, such a self-promoting bias should be less likely to occur.

**Communal narcissism and egoistic PEB.** We expected (and found) a positive correlation of communal narcissism and egoistic PEB in general measures. However, a positive correlation was also found in daily reconstruction, although no meaningful correlation was expected. Contrary to our expectations, it seems that communal narcissists knowingly aim to impress others by their PEB. It is important to keep in mind that communal narcissists do have grandiose self-related needs that they aim to satisfy. It appears that self-directed motives associated with egoistic PEB (e.g., saving money) could also be used to meet these grandiose needs.

**A comparison of methods.** As outlined, the use of the daily reconstruction method (DRM) led to markedly different results than the so far widely common general assessment of PEB. Perhaps most striking, less than 1% of the variance of daily reconstructions could be explained by general assessments, although both types of measurements of egoistic and altruistic PEB were significantly correlated to each other. As findings of previous research suggested (Bohlen et al., 1993), attitude and behavior are approximately equated in general assessments, whereas this occurs to a lesser extent when using the DRM. That is, when recent, concrete measures are used instead of general self-reported PEB, their variation is less likely to be explained by pro-environmental attitudes (Bohlen et al., 1993). This might explain the big attitude-behavior gap. When self-reported PEB is being aligned with pro-environmental attitudes, it might not reflect actual behavior. On the one hand, it is therefore questionable if a general assessment is suitable as an objective measurement of PEB. On the other hand, even the DRM can be flawed, as it also depends on participant’s self-reports. Although daily reports target a smaller period of time than general assessments, they can still be subject of overestimation. However, when asking for the correctness of
answers given in the present study, only 2.5% (N = 5) of participants admitted that they claimed a hugely positive picture on purpose.

Implications. Sub-pathological narcissism might enhance especially egoistic PEB when social circumstances allow narcissist to show off environmental awareness. This might imply a way to target people with higher levels of agentic narcissism to behave in an environmentally friendly manner. As they are seeking for self-enhancement, these benefits could be heightened by interventions to enhance PEB. Thus, interventions to enhance PEB in society could address these egoistic motivations. However, previous interventions showed that egoistic information about climate change is not more or less successful in enhancing PEB than egoistic information (Kesenheimer & Greitemeyer, 2020).

One example, how to make daily PEB socially rewarding (rather than providing information), is the success of the social media challenge “plogging.” Plogging is a neologism composed of the Swedish word plocka, which means to “pick something up” and the word jogging. To collect trash during jogging became a famous social media trend with already more than one hundred thousand tagged posts uploaded on Instagram (Instagram.com). Given that it does not really matter for formation about climate change is not more or less successful in long-lasting behavior changes (Ryan, Patrick, Deci, & Williams, 2008; van Dorsten, 2007). Motives then fit to personal values, and behaviors result from an integration of behavior patterns forming a consistent lifestyle. Therefore, altruistic PEB, being independent of external reasons, might be favorable in terms of long-term consistency. Egoistic PEB is rather a consequence of self-interest than of autonomous motivation. Hence, it would be more beneficial to enhance altruistic PEB in society.

Limitations. This study has some limitations. First, even the daily reconstruction of PEB is based on self-reports, which might be the reason why some pre-registered hypotheses had to be rejected. Especially communal narcissists might have overestimated their daily PEB in daily reconstructions. Memory biases might then have occurred in a self-enhancing manner. In addition, due to possible social desirability biases, communal narcissists more than others might have been more inclined to present themselves in a positive light in terms of their PEB. Future research may observe PEB in an even more objective manner, e.g. in field observations, without relying on self-reports at all.

Second, the imbalance of genders and specifications of our sample, and potential selection biases might diminish generalizability, as participants were mainly young (89.3% ≤ 30 years age), female (78.2%), and highly educated (94% with a minimum of high school degree). Previously, it has been shown that women are more likely to behave in an environmentally friendly way than are men (Vicente-Molina, Fernández-Sainz, & Izagirre-Olaizola, 2018) and that education has a positive impact on PEB (Meyer, 2015). This is important insofar as there are potential ceiling effects that are likely to reduce the relationship between PEB and the measures of narcissism. In addition, participants were mainly highly convicted of a climate crisis taken place and generally showed a strong pro-environmental attitude. A bigger variation in demographics and pro-environmental attitude might alter the correlations found in this study.

Future research. Our findings raise issues for future research. As just noted, a clearly objective observation of daily PEB in an experimental or field-experimental context could clarify the reasoning why relatively few of the hypotheses received support from the data in the present study. Especially when considering communal narcissism and PEB, observable behavior measures should be employed in future research to avoid potential self-enhancement biases.

In addition, future research should investigate the influence of gender, because of the observed difference between women and men concerning agentic narcissism. In general, balancing socio-demographics and pro-environmental attitude in samples would be favorable. Another issue for future research could be the further statistical validation of the duality of egoistic and altruistic underlying motives for PEB. Additionally, the success of interventions to enhance PEB should be elaborated depending on narcissism traits.

Conclusion. People are the problem as well as the solution to climate change. The value of self-enhancement seems to work against the prosocial and cooperative behaviors we need. By intuition, narcissism might act as a barrier for pro-environmental behavior. However, the present study shows how sub-pathological types of narcissism can ironically even increase daily life pro-environmental behavior, for predominantly egoistic reasons. Most importantly, the findings of the present study raise some doubts about claimed pro-environmental behavior of communal narcissists. For the prevention of further impacts of environmental degradation, underlying motives may not matter. Nevertheless, it is important to differ between pro-environmental claims and actual behavior, especially when it comes to narcissism. People might sometimes just greenwash their self.

Ethical

No ethical issues have been found to apply.

Author statement

Conceptualization, T.G. and J.S.K.; methodology, J.S.K. and T.G.; formal analysis, J.S.K.; data curation, J.S.K.; writing—original draft preparation, J.S.K.; writing—review and editing, T.G.; All authors have had and agreed to the published version of the manuscript.

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Declarations of competing interest

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Appendix

Table 3

Self-conducted general questionnaire on socially egoistic daily pro-environmental behavior (translated, originally in German language). Answers were given on a 5-point Likert-scale. Overall Cronbach’s alpha reliability: .79 [.75, .82].

| Item                                                                                            | M     | SD    | r     |
|------------------------------------------------------------------------------------------------|-------|-------|-------|
| I like to show off that I am behaving more environmentally friendly than most other people are. | 2.33  | 1.04  | .72   |
| I set a good example for others in terms of environmental awareness.                           | 3.15  | 0.98  | .69   |
| I like to own products that convey a message about my own environmental awareness to others.    | 2.64  | 1.11  | .69   |

(continued on next page)
Table 3 (continued)

| Item                                                                 | M   | SD  | r   |
|---------------------------------------------------------------------|-----|-----|-----|
| I regularly drink coffee made with a capsule machine. (inverse)     | 1.32| 0.82| .29 |
| I keep my money in an ethically fair bank account (e.g. "Umwelt Bank" (Environment Bank)) | 1.74| 1.10| .47 |
| My house/flat uses eco-electricity.                                 | 2.63| 1.37| .40 |
| I forgo taking the car and use alternatives producing less emissions (e.g. bus, train, bicycle), even if this is more uncomfortable. | 3.70| 1.06| .53 |
| I buy used clothes, shoes or sport-equipment instead of new ones.   | 2.62| 1.24| .50 |
| Whenever possible, I forgo travels by plane.                        | 3.66| 1.20| .50 |
| I do not buy products containing palm oil.                          | 2.96| 1.12| .55 |
| I only buy fruits and vegetables out of regional and organic agriculture. | 3.21| 0.99| .48 |
| I always turn off the light, when it is not needed.                | 4.45| 0.81| .38 |
| I try, whenever possible, to avoid buying plastic.                 | 3.91| 0.78| .50 |
| In winter, I do not heat a room while the windows are open for ventilation. | 4.08| 1.20| .45 |
| Because of the environment, my nutrition is vegetarian or vegan.    | 3.10| 1.47| .58 |

Table 4

Self-conducted general questionnaire on socially altruistic daily pro-environmental behavior. Overall Cronbach’s alpha reliability: .69 [.63, .74].

| Item                                                                 | M   | SD  | r   |
|---------------------------------------------------------------------|-----|-----|-----|
| I do not care if ones can see, how environmentally aware I am. (inverse) | 1.86| 1.18| .67 |
| It is important to me to show my friends that I am not a polluter.  | 3.37| 1.90| .61 |
| An environmentally aware lifestyle is a big part of me – I like people to know me for that. | 2.51| 1.17| .73 |
| I like to decorate my profile pictures on Facebook, Instagram and other social media channels with environmental signs, like the green one of Fridays for future. | 1.16| 0.52| .41 |
| I like to share with others, that I am attending Fridays for future demonstrations or other public events engaging for nature. | 2.03| 1.18| .61 |
| I do not care if ones can see, how environmentally aware I am. (inverse) | 2.58| 1.23| .35 |

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