Self-persuading norms: Adding a self-persuasion technique strengthens the influence of descriptive social norms

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ABSTRACT
Social norms have been implemented to change a variety of behaviors. Yet, these studies show noticeable dispersion of effects. We suggest that such dispersion is partially due to people perceiving reasons for following a certain norm to be more or less appealing. In testing this proposition, we couple descriptive norms with a self-persuasion technique (i.e. the self-persuading norm). We propose that the self-persuading norm operate in two steps: 1) self-persuasion leads to value-matched information, 2) value-matched information is more self-relevant, making the norm more influential. Across three experiments, we consistently found that self-persuading norms are more influential than simple descriptive norms and a control condition. The practical applications are straightforward: adding self-persuasive content seems to strengthen the descriptive norm.

Introduction

Humans are sensitive to social norms. Adjusting ones’ behavior to others has been demonstrated for trivial behaviors such as looking up at the sky (Milgram et al., 1969), to complex decisions such as behavioral responses in social dilemmas (Biel & Thøgersen, 2007; Thøgersen, 2008). The social sciences have drawn on this fundamental tendency, reporting that information about other peoples’ choices or behaviors can be implemented to change a wide range of behaviors, such as choosing a healthy lunch (Sparkman & Walton, 2017; Thomas et al., 2017), reducing alcohol consumption (Mattern & Neighbors, 2004; Ridout & Campbell, 2014), saving household energy (Allcott, 2011; Schultz et al., 2007), encouraging voting (Gerber et al., 2008), and preventing HIV/AIDS risky behaviors (Chernoff & Davison, 2005). Meta-analyses on social norm-based interventions further demonstrated that, in general, social norms change behaviors (i.e., Bergquist et al., 2019; Borsari & Carey, 2003; Scheibeheine et al., 2016). It should however be noted that in primary studies, effects vary from substantial (e.g., Bator et al., 2014; Geller et al., 1977; Karp et al., 2016), to close to zero (e.g., Kurz et al., 2005; Peth et al., 2018) or even negative (e.g., Bohner & Schluter, 2014; Richter et al., 2018). Therefore, it is important to investigate how social norm messages can be crafted for persuasive impact for both theoretical and practical reasons.
As a primary conceptual distinction, social norms are often separated into injunctive norms, signaling what ‘ought to be done’ by others’ (dis)approval, and descriptive norms, signaling what most others do (Cialdini et al., 1990). Research suggests that injunctive and descriptive norms are most effective when aligned (Ajzen, 2006, 2012; Bator et al., 2014; Bergquist & Nilsson, 2016; Hamann et al., 2015; Oceja & Berenguer, 2009; Schultz et al., 2007, 2015, see also, Cialdini, 2003). Yet, even when aligned, some interventions report no effect of social normative information (e.g., Bergquist et al., 2019).

One possible explanation for these divergent effects is that people perceive reasons for following a certain norm as more or less appealing. Research has shown that conformity tends to increase when people identify with the group communicating the norm (Abrams & Hogg, 2001; Fielding et al., 2008). Put differently, norms are more influential when communicated across people holding similar values and attitudes (i.e., in-group norms; Tajfel & Turner, 1986; Versluis & Papiès, 2016). Nevertheless, simply restricting social norm-based information to in-group messages may not always be practically feasible, such as when the actual in-group norm is counter to the preferred behavior. In this study, we will investigate if social normative information can be strengthened when coupled with self-persuasion, a technique used to increase the self-relevance of an argument.

People are more persuaded by arguments that they generate themselves, termed self-persuasion, compared to arguments that are merely presented to them, termed direct persuasion (e.g., Aronson, 1999; Loman et al., 2018). Aronson (1999) suggests that self-persuasion is more effective than direct persuasion because direct persuasion enables people to detect that someone else is trying to persuade them whereas self-persuasion leads people to assume that the motivation to change behavior originates from within the individual. Consequently, research suggests that self-generated arguments are tailored to match each individuals’ values and attitudes (A. S. Baldwin et al., 2013), making the arguments more relevant to the self. The self-persuasion effect has been applied to a range of fields such as consumer psychology (Beth Lee & Yang, 2013), health psychology (A. Baldwin et al., 2017; Drążkowski et al., 2020; Stavrositu & Kim, 2018), and environmental psychology (Damen et al., 2015; Sivasubramaniyan et al., 2021). While no previous study, that we know of, has examined whether self-persuasion enhances the effectiveness of descriptive norms, there is some evidence that self-persuasive techniques can be used to influence rule compliance (Lemmen et al., 2020) and that self-persuasion has a larger effect on attitude change when people believe that a majority of other people hold the same attitude (Gordijn et al., 2001). Based on research suggesting that descriptive norms are indeed more influential when self-relevant (e.g., Tajfel & Turner, 1986), we suggest that descriptive norms will be more influential when coupled with a self-persuasion technique.

We propose that the psychological process driving this increased influence operate in two steps. First, self-persuasion manipulation makes people match reasons for following the norm to their values and attitudes (A. S. Baldwin et al., 2013). Second, a descriptive norm that matches people’s values and attitudes will be more self-relevant, and consequently more influential (e.g., Tajfel & Turner, 1986). In terms of practical applications, classic tailoring techniques, for example, matching information to people’s values, has shown to be effective (e.g., Nilsson et al., 2016). Yet, these value-matching techniques demand a priori knowledge of people’s values or attitudes. The self-persuading norm
approach serves as a candidate for solving this problem by making people tailor the information themselves. Hence, self-persuading norms have the potential to be an easily applied modification to increase the influence of descriptive norm-based interventions.

Across three experiments, we investigate if the effectiveness of descriptive norms can be improved by the additional use of self-persuasive techniques. In Experiment 1, we compare a ‘simple’ descriptive norm to a descriptive norm coupled with a self-persuasion technique. In Experiment 2, we replicate the findings from the first experiment while also adding a no information control condition and controlling for cognitive elaboration. In Experiment 3, we test the effect of the self-persuading norm in a pro-health choice and additionally compare the self-persuasive norm to a self-persuasion technique (without the descriptive norm).

**Experiment 1: Self-persuading descriptive norm**

Will descriptive norms be more influential if people first elaborate on why others are following the norm? In Experiment 1, we test if the self-persuading norm (coupling a descriptive norm with the self-persuasion technique) will be more influential than the simple descriptive norm.

*Hypothesis 1: We hypothesize that conformity to the promoted (i.e. normative) product will be higher for participants exposed to the self-persuading norm (combining the descriptive norm with the self-persuasion technique) compared to those exposed to the simple descriptive norm.*

*Explorative hypothesis:* We will explore if participants’ rating of their reason as good or bad moderates the effect of the self-persuading norm.

**Method**

**Power analysis.** Based on the meta-analytic main effect of social norms on behavior (Bergquist et al., 2019), reporting Cohen’s $d = 0.32$ for the effect of social norms versus control condition, we estimate a slightly lower effect size between the two descriptive norms conditions ($\varphi = 0.15$). A power calculation using G*Power ($\chi^2$: Goodness-of-fit, A priori: Tails = 1, $\varphi = 0.15$, $\alpha = .05$, $1-\beta = .95$, $df = 1$) indicate a total final sample of 578. Due to expected exclusion of participants based on failed attention checks, we opt for over-recruiting to reach our targeted final sample. Experiment 1 was preregistered on the Open Science Framework: [https://osf.io/pwgyq](https://osf.io/pwgyq).

**Participants.** Seven hundred and seventeen participants located in the USA or UK ($n = 65$) were recruited via Amazons Mechanical Turk and paid .30 USD for their participation (8.7 USD/hour based on median time of HIT). All participants were informed that the study was voluntary, anonymous, and used for research purposes. All participants gave their informed consent.105 participants failed either or both of the attention checks, resulting in a final analysis of 612 participants (49.6% females, 50.1% males, 0.3% other, Age: Median = 44, Range: 17–75). All experiments followed ethical guidelines in Sweden for survey data and were thus conducted in line with the declaration of Helsinki.
Procedure and measures. Experiment 1 was a choice task asking participants to choose between two fabric softeners. Participants were provided with the following instruction: ‘Imagine that you are in your local food store and intend to buy some products. You will be presented with one pair of products, and asked to choose one of the products. If no other information is provided, there are no cost difference between the products.’ Using Qualtrics, participants were randomly assigned to either a simple descriptive norm condition or a self-persuading norm condition. All participants were provided with descriptive normative information that ‘Most others buy the white fabric softener’, and were asked to choose between two fabric softeners. The fabric softeners were identical except that the packages were either white or pink. Before making the choice, participants in the self-persuading descriptive norm condition were asked ‘What do you think: why do most others buy the white fabric softener?’ and given the opportunity to provide a written reason. Participants in the descriptive norm condition were asked to provide a reason after they made their choice. Hence, the procedure for participants in the self-persuading norm condition was 1) exposure to the descriptive normative information 2) providing a reason (i.e. self-persuasion), 3) choosing between the two fabric softeners. The procedure for participants in the simple descriptive norm condition was: 1) exposure to the descriptive normative information 2) choosing between the two fabric softeners, and 3) providing a reason (i.e. self-persuasion). After making their choice, all participants were exposed to their written reason and asked if they thought this was either a good or a bad reason. Two attention-checks asked participants to state which product they were shown (fabric softener, bottled water, peanut butter, or other), and then to state which of the fabric softeners most others bought. Finally, participants provided their age and gender.

Results and discussion

Results of the chi-square test supported hypothesis 1. More participants in the self-persuading norm condition choose the white fabric softener compared to participants in the simple descriptive norm condition (75.1% vs. 60%, $\chi^2(1, n = 612) = 15.81$, $p < .001$, $\varphi = .16$, See, Figure 1). In exploring if quality of reason affected the influence of the self-persuading norm, we found no effect for participant stating that their reason was bad ($\chi^2(1, n = 94) = 0.19$, $p = .66$, $\varphi = .05$), while the effect of the self-persuading norm was obtained for participants stating that their reason was good ($\chi^2(1, n = 517) = 16.42$, $p < .001$, $\varphi = .18$). Hence, a precondition for the self-persuading norm to increase conformity appear to be that participants provide ‘a good’ reason for why others follow the descriptive norm. Interestingly, 84% of participants rated their provided reason as good. Although the generalizability of this finding is uncertain, is it nevertheless important in terms of applications, suggesting that when people are asked to generate a reason for why others follow social norms, the vast majority did provide a reason perceived as good to them. To further control for reason, we excluded all participants who provided ‘no clear reason’. More specifically, 16 participants were excluded due to providing one of the following reasons: nothing, not sure, white, support, th, no reasons, no, idk, I have no idea, yes, none, I’m not sure, and I don’t know. Excluding these participants did not alter the results (75.4% vs. 60.6%, $\chi^2(1, n = 595) = 14.87$, $p < .001$, $\varphi = .16$).
In sum, adding to past research on descriptive norms, we tested if asking participants to describe why others conform to a descriptive norm (i.e. self-persuasion) would increase conformity. First, when asked to generate a reason for why others follow a specific descriptive norm, the vast majority of participants provided a reason that they perceived as good. This suggests that participants tailored their motives to fit the descriptive norm. Second, conformity to this ‘self-persuading norm’ was 25% higher compared to the simple descriptive norm (75.2% compared to 60%).

Although this experiment shows that adding a self-persuasive technique to a descriptive norm was more influential than simply presenting a descriptive norm, we did not include a control condition. Thus, we do not know if the self-persuading norm increases conformity compared to a control condition.

This is remedied in Experiment 2, where we add a control condition. Secondly, the self-persuading technique prompts participants to come up with self-generated arguments for the promoted behavior. This is likely to increase cognitive elaboration about the descriptive norm compared to the simple descriptive norm condition. Hence, in Experiment 1, the self-persuading norm is confounded with cognitive elaboration. In Experiment 2, we add a cognitive elaboration condition, asking people to engage in a ‘though-listing task’ to rule out that the effect of the self-persuading norm is driven by a higher degree of cognitive elaboration only.

**Experiment 2: Adding a control condition and controlling for cognitive elaboration**

In Experiment 2 we aimed to replicate the findings in Experiment 1, while also adding a control condition. In addition, experiment 2 also controlled for cognitive elaboration as a potential explanation for the influence of the self-persuading norm. Experiment 2 was
a between-subjects design including four conditions (no information control vs. descriptive norm vs. self-persuading norm vs. cognitive elaboration) assessing an online choice task. In a series of planned comparisons, we will test the following hypotheses.

**Hypothesis 1:** We hypothesize that conformity to the promoted (i.e. normative) product will be higher for participants exposed to any descriptive norm (combining descriptive norm, self-persuasion norm, and cognitive elaboration) compared to the control condition.

Replicating the findings from Experiment 1, we hypothesize (H2) that conformity to the promoted (i.e. normative) product will be higher for participants exposed to the self-persuading norm condition compared to those exposed to the simple descriptive norm condition (H2a), and the cognitive elaboration condition (H2b).

**Explorative hypothesis:** We will explore if participants’ rating of their reason as good or bad moderates the effect of the self-persuading norm.

**Method**

**Power calculation.** Based on the effect size between the simple descriptive norm and the self-persuading norm, as obtained in Experiment 1, we estimate an effect size between these condition to \( \varphi = 0.16 \). A power calculation using G*Power (\( \chi^2 \). Goodness-of-fit, A priori: Tails = 1, \( \varphi = 0.16 \), \( \alpha = .05 \), 1-\( \beta = .95 \), df = 1) based on the obtained effect in Experiment 1 indicating a sample of 508 for each comparison, suggesting a total sample of at least 1016 participants. Based on Experiment 1, we expected a data exclusion rate of 15\%. To minimize the risk of ending up with under-powered data, due to greater exclusion than expected, we over-recruited to 1500 participants. Experiment 2 was preregistered on the Open Science Framework: https://osf.io/5eydh

**Participants.** One thousand five hundred participants located in the USA were recruited via Amazons Mechanical Turk and paid .30 USD for their participation. All participants were informed that the study was voluntary, anonymous, and used for research purposes. All participants gave their informed consent. Two hundred and fourteen participants failed either or both of the attention checks, resulting in a final analysis of 1286 participants (42.4% females, 57.2% males, 0.4% other, Age: Median = 47, Range: 18–78).

**Procedure and measures.** Experiment 2 used the same basic manipulations, measures, and information as Experiment 1, with two modifications. 1) Experiment 2 assessed the choice of bottled waters, identical except for the color of the package: one being yellow and the other green. The descriptive norm was induced by informing participants that 'Most others buy the yellow bottled water'. 2) We added both a no information control condition and a cognitive elaboration condition. In the no information control condition, participants were asked to choose between the products without normative information. In a cognitive elaboration condition, participants were first exposed to the descriptive norm, and then instructed to engage in a ‘thought-listing task’ adapted from Cacioppo et al. (1997) to induce cognitive elaboration:
'We are now interested in everything that went through your mind about the information above. Please list these thoughts, whether they are about yourself and/or others; whether they are positive, neutral, and/or negative. Any case is fine.'

As in Experiment 1, all participants were exposed to their written reason and asked if they thought this was either a good or a bad reason. Two attention-checks asked participants to state 1) which product they were shown (fabric softener, bottled water, peanut butter, or other), and 2) which of the fabric softeners most others bought. Finally, participants provided their age and gender.

**Results and discussion**

Results of planned comparisons chi-square analyses supported hypothesis 1. More participants in either of the descriptive norm condition (i.e. simple descriptive norm, self-persuading norm, or cognitive elaboration) chose the yellow bottled water compared to participants in no-information control condition (66.4% vs. 47.7%, $\chi^2(1, n = 1286) = 36.16, p < .001, \varphi = .17$, See, Figure 1). Replicating the findings from experiment 1, and supporting hypothesis 2, more participants in self-persuading norm condition chose the yellow bottled water compared to participants in the simple descriptive norm condition (73.0% vs. 61.5%, $\chi^2(1, n = 662) = 9.94, p = .002, \varphi = .12$). Finally, supporting hypothesis 3, more participants in self-persuading norm condition chose the yellow bottled water compared to participants in the cognitive elaboration condition (73.0% vs. 64.7%, $\chi^2(1, n = 608) = 4.93, p = .026, \varphi = .09$).

In exploring if the quality of reason affected the influence of self-persuasion, we found that quality of reason moderated the effect ($\chi^2(1, n = 319) = 16.24, p < .001, \varphi = .23$), showing that for participants rating their reason as ‘bad’ 41.4% followed the descriptive norm, while 76.2% followed the norm among participants rating the reason as ‘good’. Hence, the self-persuading norm only increases conformity for participants rating their reason as good. Importantly, and consistent with Experiment 1, 90% of participants rated their reason as good. To further control for reason, we excluded all participants in the self-persuading norm condition who provided ‘no clear reason’. More specifically, 14 participants were excluded due to providing one of the following reasons: yes, yas, this is very used, RAMLOSA, nothing, no earthly clue, I like this survey, honestly I have no idea, I have no clue, don’t no. Excluding these participants did not alter the results (73.4% vs. 61.5%, $\chi^2(1, n = 648) = 10.04, p = .001, \varphi = .13$).

In sum, Experiment 2 replicates the effect observed in Experiment 1 and additionally shows that the self-persuading norm is more influential than a no-information control, a simple descriptive norm, and a cognitive elaborating condition. A limitation with both Experiment 1 and 2 is that we have assessed the effects on relatively arbitrary products (two similar fabric softeners and two similar bottled waters). In Experiment 3 we, therefore, aim to replicate these effects using a more consequential choice, namely a pro-health choice. Finally, Experiment 3 will compare the self-persuading norm to self-persuasion (without the descriptive norm).
**Experiment 3: Adding a self-persuasion condition and assessing a more consequential choice**

Experiments 1 and 2 consistently showed that self-persuading norms are more influential than simple descriptive norms. In Experiment 3, we once again test the effect of the self-persuading norm compared to a no-information control condition. In addition, we add a self-persuasion condition (without the descriptive norm). One limitation of Experiments 1 and 2 is that these experiments are assessing arbitrary choices. Hence, there was no clear rationale for why participants would choose either of the choice alternatives. In Experiment 3, we ask if self-persuading norms can influence non-arbitrary choices. Here, we focus on a healthy vs relative unhealthy choice alternative, testing if the self-persuading norm can promote the pro-health choice.

*Hypothesis 1:* We hypothesize that conformity to the promoted (i.e. normative) product will be higher for participants exposed to either the self-persuading norm condition or the self-persuasion condition compared to the control condition.

*Hypothesis 2:* We hypothesize that conformity to the promoted (i.e. normative) product will be higher for participants exposed to the self-persuading norm condition compared to those exposed to the self-persuasion condition.

*Explorative hypothesis:* We will explore if participants’ rating of their reason as good or bad moderates the effect of the self-persuading norm.

**Method**

*Power analysis.* A power calculation using G*Power ($\chi^2$ Goodness-of-fit, A priori: Tails = 1, Effect size $\phi = 0.16$, $\alpha = .05$, $1-\beta = .95$, $df = 1$) based on the obtained effect between the simple descriptive norm and the self-persuading norm in Experiment 1 indicating a minimal sample of 508 for each comparison, suggesting a total sample of at least 762 participants. Based on Experiments 1 and 2, we expected a data exclusion rate of 15%. Once again to minimize the risk of ending up with underpowered data, we over-recruited to 1000 participants. Experiment 3 was preregistered on the Open Science Framework: https://osf.io/mkbfd

*Participants.* One thousand participants located in the USA were recruited via Amazon’s Mechanical Turk and paid .30 USD for their participation. All participants were informed that the study was voluntary, anonymous, and used for research purposes. All participants gave their informed consent. Three hundred and forty-three participants failed either the attention check or reported to have taken the survey before, resulting in a final sample of 671 participants (44.8% females, 54.9% males, 0.3% other, Age: Medan = 43, Range: 19–70).

*Procedure and measures.* Experiment 3 used the same basic manipulations and measures as Experiment 2, with two modifications. 1) Experiment 3 assesses a pro-health choice: chocolate yogurt raisins versus natural raisins. The descriptive norm was induced by informing participants that ‘*Most others buy the natural raisins*.’ 2) We compared three conditions. Identical to Experiment 2, the control condition included no information.
Identical to Experiments 1 and 2, the self-persuading norm combined both descriptive normative information and the self-persuasion technique. Finally, the simple self-persuasion condition included only the self-persuasion technique. More specifically, asking participants to state why they would buy the natural raisins in a text box. Identical to Experiments 1 and 2, participants in the self-persuading norm and self-persuasion condition were exposed to their written reason and asked if they thought this was either a good or a bad reason. One attention-check asked participants to state which product they were shown (natural plums, chocolate chips, raisins, or others). All participants were asked if they had ‘...taken this or a highly similar survey before’. Finally, participants provided their age and gender.

**Results and discussion**

Results of planned comparisons chi-square analyses supported hypothesis 1. More participants in either of the self-persuading norm condition or the self-persuasion condition \( (n = 458) \) choose the natural raisins compared to participants in no-information control condition \( (n = 213, 70.5\% \text{ vs. } 58.2\%, \chi^2(1, n = 671) = 9.90, p = .002, \phi = .12, \text{ see Figure } 2) \). The second planned comparison assessed hypothesis 2. Results showed that frequency of the pro-health choice did not significantly differ between the self-persuading norm condition \( (n = 231) \) and the self-persuasion condition \( (69.7\% \text{ vs. } 71.4\%, \chi^2(1, n = 458) = 0.15, p = .70, \phi = .02) \), rejecting hypothesis 2.

![Figure 2](#) Results from Experiment 2 assessing choice across four conditions: no information control condition, simple descriptive norm condition, cognitive elaboration condition, and self-persuading norm condition.
Only six participants answered that their reason to choose the pro-health choice was a bad reason, hindering explorative analyses for quality of reason. To further control for reason, we excluded all participants who provided no clear reason. Twelve participants were excluded for providing one of the following reasons: yes, no, I would buy the chocolate raisins, useful, no idea, 1, cc. Excluding these participants did not alter the results for either hypothesis 1 (70.2% vs. 58.5%, χ²(1, n = 659) = 8.90, p = .003, φ = .12) or hypothesis 2 (69.3% vs. 71.2%, χ²(1, n = 447) = 0.18, p = .67, φ = .02).

**General discussion**

The results from three experiments consistently show that adding a self-persuasive technique to a descriptive social norm increases influence compared to both a simple descriptive norm condition and a control condition. We call this the self-persuading norm. The self-persuading norm contributes to research on social norm-based interventions by suggesting that the influence of descriptive norms is strengthened by adding a self-persuasive technique. Our experiments found that the self-persuading norm strengthened social influence by 17–25%, compared to the simple descriptive norm.

A critical question is whether the self-persuading norm indeed leads to value-matching. Our data is very clear on this point. Across all three experiments, 80–99% of participants rated their reason as good, while only 1–20% rated their self-generated reason as bad. This suggests that people do provide reasons consistent with their attitudes. Importantly, it should be noted that the self-persuading norm was not more influential than the simple descriptive norm when participants rated their reason as bad. This suggests that ‘mismatched’ reasons do not strengthen social normative influence. It should however be noted that our sample of participants, recruited from MTurk, might have biased the estimates of ratings if participants incorrectly perceived that providing a ‘good’ reason was a qualification for payment (please note that there were no such qualifications in either experiments). This study does not aim to, and should not be interpreted as, assessing the generalizability of the quality of argument ratings. Rather, we aimed to measure a precondition for the self-persuading norm to influence choice in this particular setting. We encourage future research to assess the precondition of subjects’ generated reasons to follow the descriptive norm in other settings using other populations.

Another critical question is whether self-persuasion might simply be explained by cognitive elaboration. In controlling for this, Experiment 2 found that a cognitive elaboration condition did not explain the influential effect of the self-persuading norm. Put differently, the self-persuading norm was more influential than simply elaborating on the descriptive norm. For elaboration to have beneficial effects on conformity, elaboration may have to be directed toward thinking only of positive or negative arguments, depending on whether an intervention aims at promoting or reducing a certain behavior.

A third critical question is the statistical power. The final sample size in Experiment 3 did not reach our aim for statistical power. Our goal was to include 762 participants, unfortunately, the final sample after implementing exclusion criteria was 671. This limitation should be taken into consideration when interpreting the results from Experiment 3. Also, it should be noted that effect sizes was based on the difference between the simple descriptive norm and the self-persuading norm. Other comparisons
(e.g., control condition vs. self-persuading norm or cognitive elaboration vs. self-persuading norm), would have generated other effect size estimates. It should however be noted that the general pattern for the self-persuading norm was clearly in line with Experiment 1 and 2. On the same note, our sample size justification for all three experiments was based on power calculations estimating the effects by a) the meta-analytic effect on social norms on behavior (Bergquist et al., 2019) and b) the obtained effect of the self-persuading norm compared to the simple descriptive norm. These rationales could be criticized both for a) measuring pro-environmental behaviors in ‘real-world’ behavior rather than online choice tasks, and b) for assessing one specific comparison (the self-persuading norm versus the simple descriptive norm) rather than all the hypothesized effects. Nevertheless, we aimed to over-recruit to compensate for potentially smaller effects than estimated. Also, in hindsight, the obtained effects were highly similar to the estimated effects across all three experiments (differing only by $\varphi = \pm 0.03$).

A fourth critical point is that all three experiments were based on purely hypothetical, non-consequential choices in an online choice task. Given that there was no real trade-off for participants, they may have been more likely to conform to the descriptive norm than if a trade-off had existed. However, this would likely only have exaggerated the difference between the descriptive norm conditions and the control condition, while we would not expect it to affect the difference between the descriptive norm and the self-persuading norm condition. Arguably, we might have observed a larger difference between the descriptive norm and the self-persuading norm condition had we used more consequential choices, as it may be easier to come up with substantive arguments for high-stake choices. However, there is also the possibility that people are more likely to come up with both positive and negative arguments when it comes to more consequential choices as they are more likely to have been exposed to a variety of arguments in such situations. As the cognitive elaboration condition (where people were prompted to think of both positive and negative arguments) was not significantly different from the control condition, future research investigating consequential choices may do well in considering the extent to which participants can generate both positive and negative arguments. Having said this, previous research on self-persuasion has shown that self-persuasion techniques are effective in changing attitudes and consequential behavioral intentions that are self-relevant and counter to the individuals’ self-interest (Briñol et al., 2012). This may indicate that the results reported here would hold for more high-stake choices where people have been exposed to both pro and con arguments.

A final critical question is that the self-persuading norm was not more influential than the self-persuasive technique, at least when considering the effects on relatively more consequential choices (i.e., health choice). These two self-persuasion techniques may however be more or less appropriate in different situations. In situations where providing truthful information about in-group or majority norms is difficult or impossible, the use of a self-persuasion technique for promoting a certain behavior may be a beneficial alternative. Furthermore, given the large number of people stating that their self-generated arguments were good, self-persuasion techniques may be more beneficial than social norm interventions in situations where one might anticipate reactance effects from the social norm. Given that descriptive norms tend to be more influential when people perceive uncertainty about the
appropriate response is (e.g., Gelfand & Harrington, 2015), self-persuading norms may similarly be more influential in situations that are characterized by uncertainty and may in such situations be more effective than a simple self-persuasion technique. This would have some real world implications. For example, in the case of vaccination against COVID-19, this could mean that a self-persuading norm would be especially effective when people perceive for example, scientific uncertainty as to the safety and effectiveness of vaccines. On the other hand, the use of descriptive norms may be more effective than self-persuasion in situations where people make instantaneous choices. That is, as self-persuasion warrants that people have the time to first attend to prompts about generating arguments and also the time to generate arguments, this technique may not be suitable in situations where people make fast choices.

These results suggest that descriptive norms are more effective when there is some argument for the norm. Adding to previous research (Jacobson et al., 2011), this implies that descriptive norms are not necessarily more effective when people conform in a strictly automatic fashion. Future research may do well in considering whether the positive effect of a self-persuaded norm is mediated by an increased sense of similarity with the group communicating the norm, in line with some previous research (Gordijn et al., 2001). That is, when prompted to think about why other people conform to the norm, participants presumably generate arguments that are in line with their own values, potentially increasing their identification with the group. Future research might consider whether certain social norm interventions are successful because they implicitly promote self-persuasion. For example, research has shown that making commitments improved social norm-based interventions (Jaeger & Schultz, 2017). It might be that when committing to a behavior, people are forced to consider reasons for performing that behavior, and hence engage in a type of self-persuasion process. Another applied research question, which is currently discussed, is how social and behavioral science can be implemented to support COVID-19 pandemic responses (e.g., van Bavel et al., 2020). One particularly relevant issue for the self-persuading norm is vaccine resistance. More specifically, that a minority does not conform to the majority's decision to vaccinate against COVID-19. Refined social norms-based interventions might be one strategy to persuade this group of people to conform to the majority. Yet another question is to assess the potential effect of cultural norms. Preliminary evidence suggests that self-persuasion is more effective than direct persuasion mainly for people from an individualistic culture, whereas people from collectivist cultures are more influenced by direct persuasion (Li et al., 2020). This could indicate that the combined use of social norms and self-persuasion is more effective than only a self-persuasion technique in collectivistic cultures, as social norms may be seen as a more direct form of persuasion.

In sum, three experiments consistently found that self-persuading norms are more influential than simple descriptive norms and a control condition. We propose that this strengthened social influence operates in two steps: 1) self-persuasion leads to valued-matched information, and 2) valued-matched information is more self-relevant, making the norm more influential. The practical applications of the self-persuading norm are straightforward: the social influence of a simple descriptive norm was strengthened by adding self-persuasive content. We encourage future research to further explore when
and how the self-persuading norm can be implemented to craft the persuading impact of descriptive norms.

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**Data availability statement (DAS)**

Data from all three Experiments and an SPSS syntax file are publicly available at the Open Science Framework: https://osf.io/3m8wy/

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