A Replication Study to Evaluate People's Conformity to Descriptive Norms

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Abstract

The alignment of people's decisions with the descriptive norm of people with opposing or similar opinions was examined in this experiment. This was analysed as a replication of a study conducted by Pryor, Perfors, and Howe in 2019. According to the self-categorization theory, people tend to conform their beliefs to those of a group they identify with and actively avoid conforming to people outside of this group. The descriptive norm effect, however, states that people will conform with the majority of others regardless of their beliefs. To test this, we presented participants with a moral dilemma, informed them about the action chosen by people they identified with, and further stated that this action was unpopular with people outside their group. They were then asked to make a decision on how to act themselves. Our findings suggest that participants do not tend to conform to the overall descriptive norm compared to acting according to the self-categorization model.

Forming groups and creating societies has played a major role in human evolution, especially the association with a group — which then is defined as the ingroup — has played a decisive role in survival, further development, and in the identification and formation of one's self-image (Sherif, 1936; Asch, 1951; Guindre-Parker & Rubenstein, 2020). It can also positively contribute to one's well-being (Greenaway et al., 2015).

The self-categorization theory (Hogg, Turner, & Davidson, 1990) states that for this reason, groups tend to have similar norms, values, and belief systems. People will align their opinions and decisions with those of the group they identify with. Furthermore, they will actively disagree with the beliefs of their outgroup, which represents the group of people they do not identify with. Therefore, to prove self-categorization theory, mean choices of action should represent the descriptive norm favoured by the ingroup.

The descriptive norm effect however describes the phenomenon that individuals tend to behave similar to other people and therefore align with the descriptive norm regardless of whether it originates from the in- or outgroup. Accordingly, the described phenomenon does not take group identity into account. Instead, it implies that if people tend to conform to the descriptive norm, the mean choices of action will be identical to the descriptive norm across all possible experimental conditions.

Therefore, Pryor et al. (2019) tested the interaction of group identity according to the self-categorization theory and the descriptive norm effect by asking participants to act upon a dilemma after informing them about the action their ingroup chose and that their outgroup – which represented the majority of people – favoured the opposite action.

We decided to conduct a replication of their study, specifically of the first experiment they carried out. We tested whether people are more prone to conform to descriptive norms of their social ingroup in the situation of a moral dilemma - which would support the self-categorization theory - or whether they are more likely to follow the overall descriptive

norm even if it is the norm of the outgroup. Thereby, our null hypothesis reflects the self-categorization theory while the alternative hypothesis states that the overall descriptive norm is more strongly conformed to.

Method

Participants

88 participants (median age = 23 years, 55% female) were recruited via online advertisement. No compensation was offered for participation. The experiment was completed online in a web browser and took around 3 minutes. All subjects were informed about their participation in a study and that their data were collected anonymously. The data collection was performed blind towards the experimental manipulations, as those were assigned at random, but during the analysis, we were able to distinguish between different treatment groups.

Materials and Procedure

After collecting (optional) basic demographic information, participants were asked to choose a topic they were interested in out of a list of eight socially and politically relevant topics, for example climate policy, meat consumption, or abortion. Following this, a statement on the chosen topic was presented to the participant. If they had, for example, selected the topic meat consumption they were presented with the statement "Meat consumption must be avoided entirely." To carry out a preliminary classification of ingroup and outgroup membership, the participant was shown an 11-point Likert scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree). They had to choose to what extent they agreed or disagreed with the statement.

In the next step, the participant was presented with further instructions and informed that the current experiment was being conducted as a follow-up study to a previous paper, claiming that the original paper dealt with the actions and emotions associated with moral

dilemmas. This was to justify the questions asked during the experiment. Afterwards, the

participant was presented with a typical moral dilemma:

> *Imagine you have witnessed a man rob a bank. However, you then saw him do*
> *something unexpected with the money. He donated it all to a run-down orphanage*
> *that would benefit greatly from the money. You must decide whether to call the police*
> *and report the robber or do nothing and leave the robber alone.*

Additionally, one of two possible statements was displayed below the moral dilemma

simulating the ingroup descriptive norm. This statement was either

> *...approximately 60% of participants who agreed with you about* [social/political
> issue] *chose to do nothing and leave the robber alone.*

or

> *...approximately 60% of participants who agreed with you about* [social/political
> issue] *chose to call the police and report the robber.*

Further, half of the participants were shown an outgroup statement telling them that

85% of people disagreeing with them on their chosen topic decided to take the exact opposite

action as their ingroup.

Participants were subsequently presented with a 6-point scale with actions, ranging

from definitely reporting the robber to definitely leaving the robber alone. They were asked,

given the moral dilemma, which action they would choose. In the following filler trial, they

were asked how they felt about their decision in order to support the backstory with which

they had been instructed on the experiment.

To ensure that all participants had read the instructions carefully and did not give

randomly chosen answers, an understanding check followed. Lastly, Postmes, Haslam, and

Jan's single-item social identification measure (Postmes et al., 2013) was used to assess

whether the test-persons identified with the ingroup assigned based on the issue rating in the

beginning and separated themselves from the respective outgroup.

Design

Our experiment includes two independent variables, the first one being *ingroupNorm*, describing whether the ingroup norm favoured reporting the robber (*ingroupNorm* = 0) or leaving him alone (*ingroupNorm* = 1). The second independent variable, *bothShown*, describes whether an outgroup statement was shown in addition to the ingroup norm (*bothShown* = 1) or not (*bothShown* = 0). This results in a 2 x 2 factorial between-subjects design with four experimental conditions, identical to the original experiment. Conditions were assigned at random via a version of the Fisher-Yates shuffle, however, after data preparation and cleaning, the remaining subjects were not evenly distributed over all conditions (see Table 1). Whenever both norms were shown, the order they appeared in was randomly varied to control for possible bias towards one norm.

The variable of interest, *response*, was the choice of action the participant decided to take in response to the moral dilemma. Two courses of action were offered, namely to '*call the police and report the robber*' or '*do nothing and leave the robber alone*'. Each action was further subdivided into three stages with descending order from '*definitely*' over '*very likely*' to '*probably*', leaving the participants with a total of six actions. Definitely calling the police on one end of this scale was coded as *response* = 1, definitely doing nothing on the other end as *response* = 6. We also measured whether the participants actually agreed with their in- and disagreed with their outgroup, based on their rating of the statement shown at the beginning. *ingroupAgree* and *outgroupDisagree* were both binary (1 if true, 0 if false).

Participants were excluded from the analysis if they failed the understanding check or claimed to have a neutral stance on the topic they chose since in that case no clear assignment of in- and outgroup was possible.

Results

Data collection took place over ten days. 88 submissions were gathered from which 15 had to be excluded due to failure of understanding check ($n = 13$) or neutral stance ($n = 2$). The distribution of responses of the remaining subjects can be seen in Figure 1.

Models

We performed a confirmatory analysis using Bayes factors to compare two possible models for the explanation of our data. The first account, in the following referred to as self-categorization, predicts that an individual will conform with the ingroup descriptive norm and actively avoid conforming with her outgroup. The second account, in the following referred to as the alternative model, predicts that an individual will follow the overall descriptive norm, regardless of whether that norm originates from the in- or outgroup. Both models, as described shortly, express Bayesian versions of ordinal logistic regression, which

> *[...] predicts the proportions of responses on an ordinal scale while assuming that certain variables [...] change the odds of making higher or lower responses on the scale. [...] [T]he variables are parameterized in terms of the natural log odds of favouring a higher response [...].* (Pryor et al., 2019)

A higher response, in this case, means a higher score for the variable *response*, which simply means a higher tendency for not reporting the robber. The models can be represented as the following formula:

$$log_e \text{ (odds of higher response)} = b_{in}\, I \;+\; b_{both}\, B \;+\; b_{out}\, I \times B$$

In this formula, I represents the variable *ingroupNorm*, B represents *bothShown*, and $I \times B$ is an interaction term between those two referring to the outgroup norm; since the outgroup norm was always opposite to the ingroup it can be derived from the former two. The coefficients b_{in}, b_{both}, and b_{out} stand for "the effects of changing these conditions" (Pryor et al., 2019).

Since the self-categorization model assumes identification with the in- and distancing from the outgroup, the variables *ingroupAgree* and *outgroupDisagree* can be incorporated into the model:

$$log_e \text{ (odds)} = b_{in} I \times \text{INGROUP AGREE} + b_{both} B + b_{out} I \times B \times \text{OUTGROUP DISAGREE}$$

The additional variables are used to determine whether a person is influenced by the respective norms: If they do not identify with the ingroup (*ingroupAgree* = 0), the ingroup effect is irrelevant. The same goes for not disagreeing with the outgroup; in that case one would not try to actively avoid the outgroup norm and, hence, the effect becomes extraneous.

Prior Assumptions

Since we wanted to replicate the findings of Pryor et al., we used the same priors. Specifically, the prior distribution for both models for parameter b_{in} is a folded normal distribution (M = 0.816, SD = 0.5) and for parameter b_{both} a normal distribution (M = 0, SD = 0.5). Parameter b_{out} uses different priors for the models because it differs in the effect it has: For self-categorization, it is presumed to increase conformity with the ingroup, hence a half-normal distribution restricted to be greater than 0 (M = 0, SD = 0.5). For the alternative account, derived from the percentage of people supposedly agreeing or disagreeing with the participant's chosen topic, the prior is set to be $- \frac{0.85}{0.6} b_{in}$.

Model Comparison

Again, as in the original paper, we compared the probability of the alternative model predicting the data to that of the self-categorization model using Bayes Factors with the "Bridge Sampling" package in R (Gronau et al., 2017). In fact, we largely used the same analysis script as Pryor et al. We obtained a Bayes Factor of 2.9, meaning that, per the interpretation scale by Jeffreys (1961), our collected data provides no evidence in favour of the alternative model over the self-categorization account and, thus, does not support the

findings of the original paper. The prior as well as posterior distribution of parameters for both models can be seen in Figure 2.

Discussion

The self-categorization theory states that individuals are prone to adapting salient norms of and aligning their decisions with their ingroup (Hogg et al., 1990), while the descriptive norm effect describes the phenomenon that people tend to align their actions with those of the overall majority. Given these theories, we implemented this experiment to test which account influences participants more in their choices. However, the results we obtained show no significant effects. Our findings do not support the results of the prior study from Pryor et al., who found evidence for the overall descriptive norm having more influence than the self-categorization effect (Pryor et al., 2019). This could be due to various reasons.

To begin with, our analysis did not take into account different prior values for the b_{out} parameter. This was, however, done by Pryor et al. (2019), which resulted in significantly higher Bayes Factors for higher means and standard deviations. Neither did we perform a Frequentist analysis on the effect sizes for the parameters reported in Equation 1, the results of which led them to conduct a second experiment with supposedly stronger and more naturally defined in- and outgroups.

Secondly, our replication took place in Germany and, therefore, used different materials — both in language and topic — than the ones used in the original study. Changing the language of the materials to German was necessary as the mother tongue of the majority of subjects was German ($< 5\%$ reported a native language other than German or did not specify). We could not use the same topics and statements as used by Pryor et al. as they were mostly not suitable for our target group in Germany from a cultural perspective and partly outdated.

A major restriction was the scope of our participants being rather limited in terms of number of participants and demographic variety. Pryor et al. had about three times more participants and, unfortunately, our distribution of subjects among the different conditions was not even anymore after data preparation. Further, since we recruited from our personal circles, subjects did not represent a sufficiently great variety of social classes, educational backgrounds, or ethics. This becomes obvious when looking at the choices of topics: Out of eight topics to choose from, the majority (80%) opted for climate policy ($n = 45$) and abortion ($n = 14$). This can be seen in Figure 3. Additionally, our median age ($= 23$ years) was very low and the demographic information provided by most participants tells us that almost all are exposed to higher education.

While there is little research regarding the effect of education on the ingroup bias in general, Rui et al. found evidence for sexual education weakening the ingroup bias towards trust and fairness (Rui et al., 2019), which could indicate that higher education generally leads to less ingroup bias. This would be interesting to research in future work.

Some aspects played a role in both this study and the experiment conducted by Pryor et al. First of all, what was titled as the "overall descriptive norm" was represented in the statements as just the descriptive norm of the outgroup. Thereby, the majority of the outgroup was mistaken for the overall majority.

A factor that might have influenced both this study and the one conducted by Pryor et al. is that some ingroups could have stronger effects than others (Mullen, Brown, & Smith, 1992). For instance, people who do not consume animal products are also known as vegans. Therefore they have a group identity and social affiliation, whereas there is no specific term used to describe the ingroup for "Pension-Age-Increase Advocates". The ingroup being more salient could lead to vegans being more prone to influences from their ingroup than subjects that chose the pension age as their social issue.

Not covered in this or the original experiment was a control condition to examine to what extent people get influenced by the ingroup bias or descriptive norm. While previous research confirms these influences to exist (Hogg et al., 1990; Asch, 1951; Moscovici, Lage, & Naffrechoux, 1969), we received feedback from participants stating that they had learned to exert their own opinion and therefore actively ignored the statements about the decisions of others on purpose. This experiment would have benefited from an additional control condition testing which action subjects tend to choose when no statement was shown that could influence them. However, our resources did not allow us to recruit enough participants to measure this.

Furthermore, our study raised the question of whether there are fundamental differences in the sociality and culture of US-Americans and Germans. Previous research found that a different construal of the self, i.e. independent as opposed to interdependent, might very well influence one's decision making with an interdependent understanding of the self leading to more adaptation towards the ingroup (Markus & Kitayama, 1991).

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Tables

Table 1

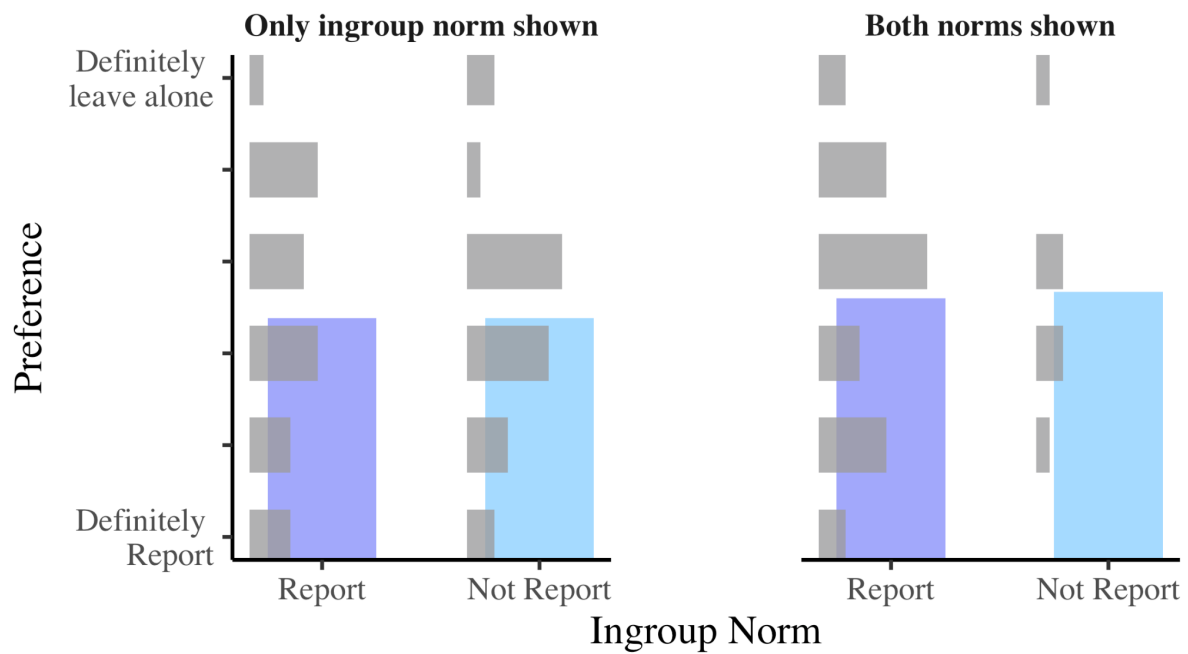*Assignment of Participants to Experimental Conditions*

ingroupNorm	bothShown	n	%
0	0	21	28
0	1	25	34
1	0	21	28
1	1	6	8

Note. $N = 73$. Table showing the distribution of participants to experimental conditions after data preparation.
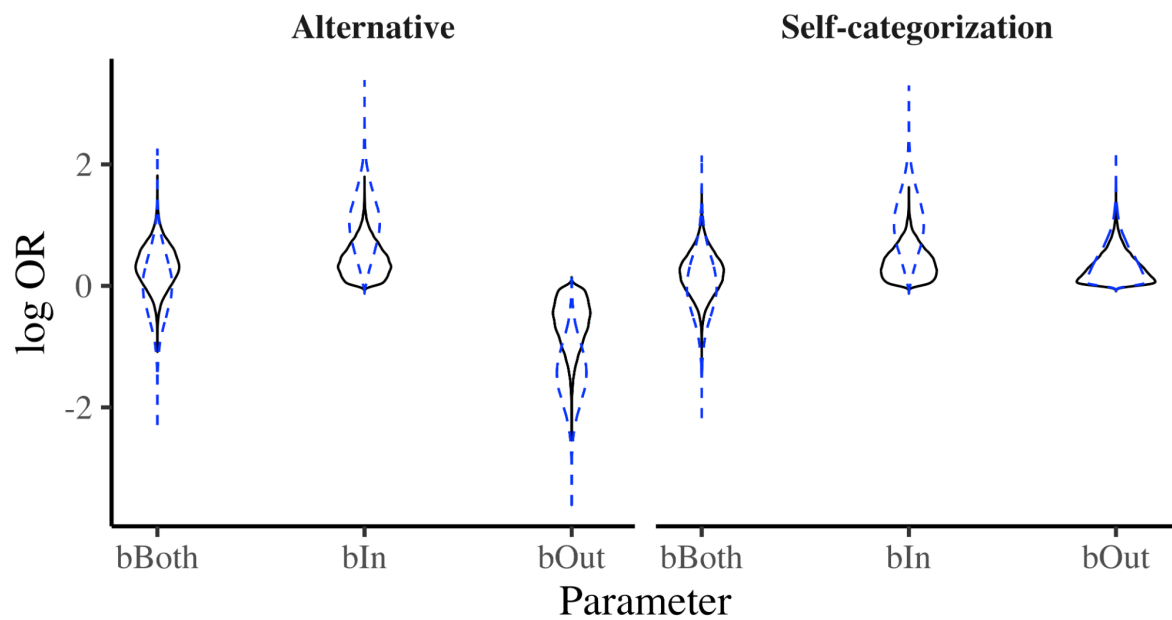
Figures

**Figure 1**

Responses to the Moral Dilemma

Note. Superimposed bar chart showing the responses to the moral dilemma; relative proportion of each response in each condition is shown by the grey horizontal bars while the blue vertical bars show the mean response in each condition.

Figure 2

Prior and posterior density of parameters

Note. Violin plot showing the prior distribution (dashed blue line) and the posterior

distribution (black solid line) of parameters for both the alternative and the self-categorization

account.

Figure 3

Topics Chosen by Participants
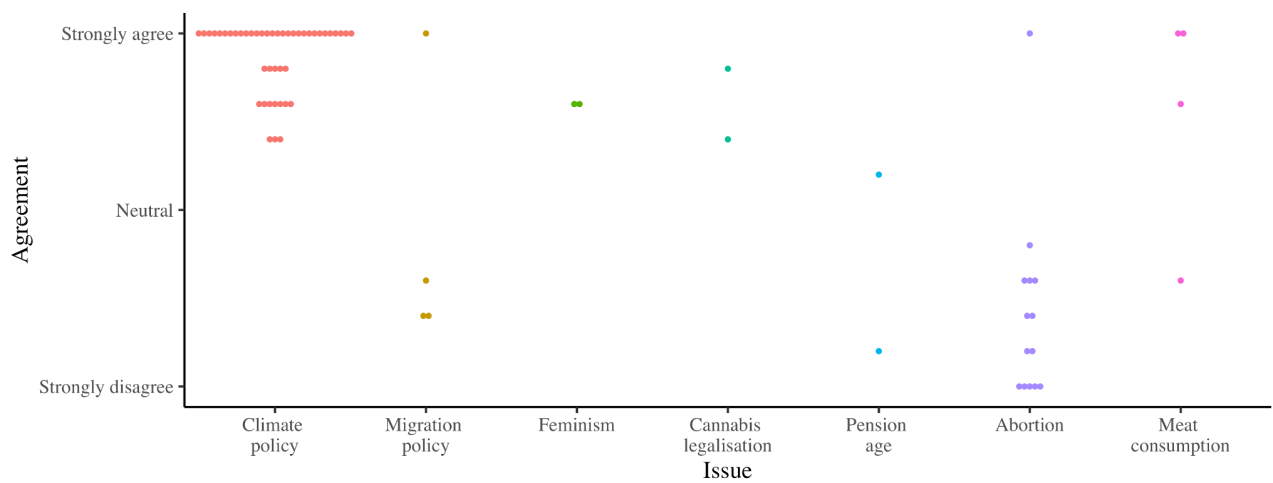
Note. Dot plot showing which topics were chosen by participants as well as how the corresponding statements were rated. The topic education was not chosen at all and is, therefore, not included in the graphic.