Title
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Abstract

Research on human reasoning is dominated by demonstrations of the errors people make in various judgment and decision-making tasks. The area of social cognition is not an exception: the list of apparent errors is long and includes a number of contradictory phenomena. Here we explore a prominent example of the contradictory pairs of biases: false consensus and false uniqueness. We show in an empirical study and with simulations that the consensus in the literature about the stability of these effects may be premature, as their occurrence depends on the format of questions used to measure them.

Keywords: False consensus; false uniqueness; social circle; response formats.

Introduction

The false consensus effect (Ross, Greene, & House 1977) or "looking glass perception" (Fields & Schuman 1976) describes a phenomenon that people who exhibit a certain behavior or endorse a particular view ("performers") believe that this behavior or view is more common overall than do people with different behaviors or views ("nonperformers"). For example, Democrats would judge that democratic views are more spread in the general public than Republicans would. This kind of result has been documented so often that the false consensus bias has been considered an automatic response that may be "developmental vestiges of the infantile belief that all others are like us" (Krueger & Clement, 1994, p.609). However, an opposite bias called false uniqueness has also been documented (Frable, 1993; Mullen, Dovidio, et al., 1992). People holding a particular view sometimes tend to think that their view is less popular than do people holding a different view.

At least five different explanations have been proposed to explain false consensus effects (Marks & Miller, 1987). First, people are likely to have selective exposure to similar others, so their estimates of larger social environments are based on biased samples. Second, their preferred view may be more salient to them than a different view, which may make them think that their preferred view has a stronger social support. Third, people may believe that situational factors that led them to hold a particular view will affect others in a similar way, leading them to adopt the same view as well. Note that this view contrasts with another popular bias, namely the fundamental attribution error, whereby people believe that their behavior is caused by situation but others' behavior is caused by dispositional factors. Fourth, believing that others share one's view may have a motivational cause, such as fulfilling the need to validate own belief and maintain self-esteem. Fifth, false consensus is in line with a Bayesian analysis that assumes a uniform prior distribution and one's own view as the only evidence (Dawes & Mulford, 1996).

It is more difficult to explain false uniqueness. Suls and Wan (1987) extend the motivational account and propose that false uniqueness can contribute to one's self esteem when the behavior or view in question is desirable, but find inconsistent support for this view (Suls, Wan, & Sanders, 1988). Moore and Kim (2003) show that because people rely more on information about themselves than about others when forming judgment of prevalence of their views, effects similar to both false consensus and false uniqueness can occur. However, their measure of these effects is different than that used in most other studies: they use the difference between people's judgments and true population values rather than the difference between judgments of groups of people holding different views.

Here we investigate a so far neglected possible factor that may lead to both effects: the format of the questions used to measure these effects. Most studies investigating false consensus use one of two response formats. Either they ask about both the percentages of performers and non-performers, for example, "What % of your peers do you estimate would carry the sandwich board around campus?__% What % would refuse to carry it?__% (Total should be 100%)" (Ross, Greene, & House, 1977), or they ask only about the percentages of performers, e.g., "What percentage of students do you think agreed to wear the sign?" (Krueger & Clement, 1994). There are no studies, however, that compare how different response formats affect estimates of the false consensus effect. For example, it is not known whether the effect would remain the same if participants were asked about nonperformers rather than performers. It is well known from survey methodology literature that response formats can have strong effects on answers independently of people's true beliefs (Tourangeau, Rips, & Rasinski, 2000). Similarly, research on subjective probability calibration shows that people can appear overconfident, well calibrated, or underconfident depending on the response format used (Juslin, Wennerholm, & Olsson, 1999). This motivates us to explore these effects in the case of false consensus and false uniqueness effects.

Method

We asked 104 participants recruited from Mechanical Turk (43% female, mean age 34, 44% with bachelor or higher degree) three groups of questions about 10 characteristics, listed in Table 1. The questions were taken from publicly available results of large national surveys (Gallup World Poll 2011 for characteristics 1-5, Pew Center 2011 for 6-10); full texts are available on request. In the present study, participants first gave their personal answer to each of the 10 questions. In this way we classified them as either performers or nonperformers on a particular characteristic. Thereafter they estimated the percentage of performers and/or nonperformers in their social circle (defined as adults you were in personal, face-to-face contact with at least twice this year), and in the general population of the United States. One random half of the participants answered the questions about their social circle first, and another half about the population.

For each characteristic, a random third of performers and a random third of nonperformers gave estimates of social circle and population percentages in one of the following response formats: 1) estimating *only* the percentage of performers, 2) estimating *only* the percentage of nonperformers, and 3) estimating *both* percentage of performers and nonperformers. Figure 1 provides an example of the three response formats for one of the characteristics, and Table 2 lists all formats. Note that in format 3 the estimates for performers and nonperformers have to sum to 100, but there is no such check in formats 1 and 2. Estimates for social circle and for the population were given always in the same format. The same individual could have answered questions for different characteristics in different formats, depending on whether he was a performer or nonperformer himself, and to which response format group he was randomized to.

Table 1: Characteristics used in the study, along with percentage of people answering "yes" (performers) in national surveys, and percentage of such people in the present sample.

	Characteristic	Population % of performers	Sample % of performers
1	No money for food in past 12 months	19	18
2	Donated to charity last month	57	41
3	Experienced theft in past 12 months	12	21
4	Religion is important part of daily life	64	28
5	Attended worship in past 7 days	47	14
6	Belief in God necessary to be moral	53	13
7	Believes in God	70	54
8	Smokes tobacco at least once/day	15	24
9	Military force sometimes necessary	77	84
10	Homosexuality should not be accepted	36	18

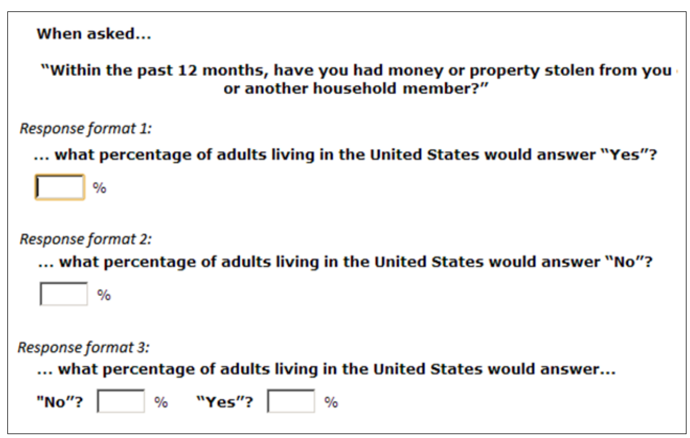

Figure 1. Example of the three response formats used to elicit estimates of performers and nonperformers in general population.

Table 2: Different ways in which prevalence of performers can be inferred, depending on the response format.

Response format	Estimates about prevalence of	Estimates given by	Abbre-viation
1	Performers only	Performers	P.P
2	Nonperformers only	Performers	NP.P
3	Performers and Nonperformers	Performers	Pnp.P NPp.P
1	Performers only	Nonperformers	P.NP
2	Nonperformers only	Nonperformers	NP.NP
3	Performers and Nonperformers	Nonperformers	Pnp.NP NPp.NP

False consensus and false uniqueness can be measured in different ways. The most prevalent approach in the literature is to calculate the difference between the prevalence of performers as estimated by performers (P.P) and the prevalence of performers as estimated by nonperformers (P.NP). A positive difference P.P - P.NP is interpreted as false consensus, and a negative difference as false uniqueness. In our study, separate groups of both performers and nonperformers gave estimates in 3 different formats. This enables calculating the size of false consensus in 9 different ways, listed in Table 3.

Table 3: Different ways in which false consensus effects can be calculated, depending on the response format.

Type of false consensus	Calculation
11	P.P - P.NP
12	P.P - (100 - NP.NP)
13	P.P - Pnp.NP
21	(100 - NP.P) - P.NP
22	(100 - NP.P) - (100 - NP.NP)
23	(100 - NP.P) - Pnp.NP
31	Pnp.P - P.NP
32	Pnp.P - (100 - NP.NP)
33	Pnp.P - Pnp.NP

Results

How stable are false consensus effects across different response formats? If response format does not play a role, estimates of prevalence of performers should be the same for all formats, consequently resulting in same direction and size of false consensus effects. However, Figure 2 shows that the effects vary depending on response formats used to estimate prevalence of performers. The most extreme example is characteristic number 1 (no money for food), where estimates exhibit false uniqueness when performers estimate prevalence of performers (types 11-13), but false consensus when performers estimate prevalence of nonperformers (types 21-23) or when they estimate prevalence of both performers and nonperformers (types 31-33). Several other characteristics show similar patterns of both false consensus and false uniqueness effects.

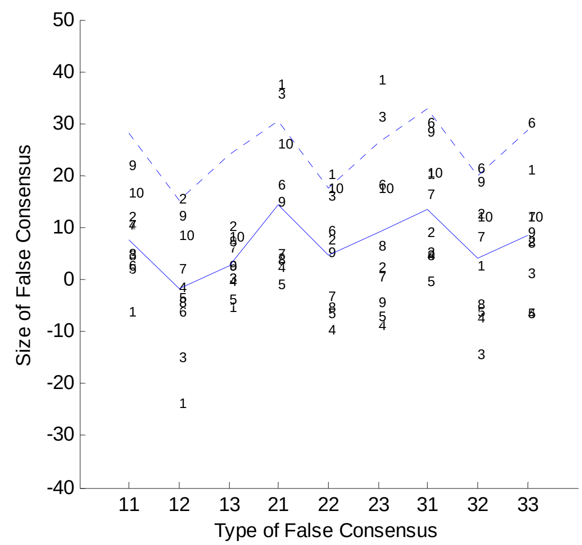

Figure 2: False consensus effects for nine different ways of calculating false consensus (see Table 3 for details). Small numbers denote effects for different characteristics. Full line denotes mean of the effects. Dotted lines denotes difference between performers and nonperformers in participants social circles (see text).

How can these different false consensus and false uniqueness effects for the same characteristics be explained? We propose a simple model of how estimates of prevalence of performers in the population are derived. The model has two plausible assumptions. First, people derive estimates about the general population based on the samples they have in their immediate social environment, that is their social circles (see Galesic, Olsson, & Rieskamp, 2012, for a social circle model that accounts for people's estimates of population distributions). Support for this assumption is shown in Figure 2, where dotted line represents differences in percentages of performers and nonperformers, calculated by different methods, in participants' social circles. They parallel the population estimates (r=.89).

Second, we assume that to derive these estimates, people attempt to recall as many individuals in their social circle belonging to the required category (e.g. performers) as they can. Because of time and effort limits, they are often not able to recall all such individuals. Consequently they may underestimate the percentage of those individuals in the population *relative* to what they would report had they recalled all such individuals in their social circle.

The model can be formalized for each response format separately, as follows. Recall that to estimate false consensus effects, a researcher needs estimates of prevalence of performers. When a person is asked only about performers in the general population (response format 1, see Table 2), his estimate of population prevalence of performers can be modeled as:

$$P_1 = SC_P \times \alpha,$$

where P_1 is the performers' population prevalence estimated in response format 1, SC_P is the percentage of that person's social circle that are performers, and α is a memory activation level parameter ranging from 0 to 1. Note that according to this model people are assumed to always estimate population prevalence of performers as lower or equal than in their social circle. When a person is asked only about nonperformers in the general population (response format 2), his estimate of population prevalence of performers can be inferred from his estimate of population prevalence of nonperformers. This can be modeled as:

$$P_2 = 100 - SC_{NP} \times \alpha,$$

where SC_{NP} is the percentage of that person's social circle that are nonperformers, and the meanings of other symbols are the same as above. Note that if prevalence of nonperformers is underestimated (α<1), then the inferred prevalence of performers in this response format will be overestimated relative to the true percentage in the social circle.

Finally, when a person is asked to estimate the percentage of both performers and nonperformers (response format 3), his estimate of population prevalence of performers can be modeled as:

$$P_3 = 100 \times \left(\frac{SC_P \times \alpha}{SC_P \times \alpha + SC_{NP} \times \alpha} \right) = SC_P,$$

where meanings of symbols are the same as above. Because in this response format percentages of performers and nonperformers have to sum to 100, the denominator serves to normalize the sum of prevalence estimates of performers and nonperformers, which would be lower than 100 if α<1. That is, it is assumed that people recall a subset of performers and nonperformers from all performers and nonperformers in memory, and then estimate the percentage of each group in the sum of both groups. If their recall of performers and nonperformers is unaffected by other factors (see Discussion for more comments on this possibility), then their population estimate of performers equals the percentage of performers in their social circle (SC_P).

Note that for simplicity we do not model the fact that reports of social circles are similarly affected by response formats as the population estimates. However we believe that modeling this would only make estimated parameters larger, but would not change relative differences between estimates in different formats.

To check whether this simple model could reproduce the pattern of results in Figure 2, we simulated estimates of prevalence of performers for 10 different fictitious characteristics with social circle prevalence ranging from 1% to 91% in steps of 10 percentage points. We modeled population estimates using the formulas above and different values of α. For *all* values of α lower than 1 the pattern of false consensus effects is very similar to the empirical results in Figure 2. Figure 3 shows an example for α=.8.

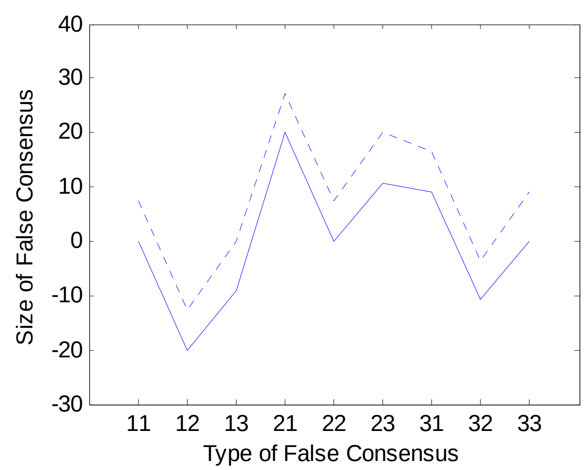

Figure 3: Simulated patterns of false consensus and false uniqueness effects, for α=.8. Full line denotes results assuming the same social circles for performers and nonperformers. Dotted line denotes results assuming that performers know relatively more performers than do nonperformers.

As visible in Figure 3, the pattern of false consensus and false uniqueness effects in this fictitious data set is very similar to the empirical pattern shown in Figure 2. The full line represents false consensus estimates assuming that performers and nonperformers have the same percent of performers in their social circles. However, in reality each group typically knows more individuals similar to themselves. Therefore we observe stronger false uniqueness effects in the simulation than in the empirical data. However, if we assume a small difference in social circles so that nonperformers have 20 percentage points fewer performers in their social circles than do performers, all effects shift towards stronger false consensus. This is shown as a dotted line in Figure 3.

Discussion

The pattern of false consensus and false uniqueness effects seems to be a product, to a large extent, of the way questions are asked and the samples people take from their social environments.

If both performers and nonperformers are asked about their own groups (false consensus type 12), then false uniqueness effects are likely to occur. This is so because imperfect recall of nonperformers about the members of their own group leads to inflated estimates of the prevalence of performers. More generally, when nonperformers are asked about their own group rather than about performers (types 12, 22, and 32), we see a reduction of false consensus that in some cases turns into false uniqueness.

In contrast, when nonperformers are asked about performers (types 11, 21, and 31), the imperfect recall alone will lead to underestimation of performers' prevalence. If there is no difference between social circles of performers and nonperformers, then the false consensus effect for type 11 will be zero (see the point 11 of the full line in Figure 3). If there is a difference, then the false consensus effect will occur, as in the point 11 of the dotted line in Figure 3 and in empirical results in Figure 2). In all other conditions where nonperformers answer about performers, false consensus effects are most likely.

The two response formats that are most often used in the literature, where performers and nonperformers answer about performers only (type 11) or about both performers and nonperformers (type 33), produce very similar false consensus effects. This may contribute to the wide-spread consensus in the literature about the robustness of the false consensus effect. However as our findings show, false uniqueness and false consensus can occur for the same characteristics, depending on how the question is asked. Therefore false consensus may not be such a robust bias as previously assumed.

Note that the simple model described here neglects effects of frequency of contact on recall, and does not specify how the percentage estimates are formed in the first place. This model cannot explain the empirical fact that population estimates often resemble smoothed versions of one's social circle (Galesic et al, 2012), that is performers report smaller proportion of performers and larger proportion of nonperformers in population than in their social circle. A more elaborate model would describe how people sample from their social circle, for example based on frequency of contact, and how they estimate the percentage of performers based on that sample. The final estimates are likely to be shaped by both, effects of question format, and other sampling and estimation processes.

A common approach to explaining apparent errors in social judgments is to look at the human mind and search for motivational and cognitive processes that deviate from normative rules of reasoning. Here we show that properties of social environments as well as of memory processes, and their interplay with the way questions are asked, can produce apparent false consensus and false uniqueness effects on its own. This work does not diminish the potential importance of other explanations of origins of these effects, but provides a baseline for the part of these effects that are artifacts rather than a cognitive bias.

Acknowledgments

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