COGNITIVE SCIENCE
A Multidisciplinary Journal

Cognitive Science (2016) 1–16

ISSN: 0364-0213 print / 1551-6709 online
DOI: 10.1111/cogs.12380

The Influence of Social Interaction on Intuitions of Objectivity and Subjectivity

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Received 26 September 2015; received in revised form 9 February 2016; accepted 11 February 2016

Abstract

We present experimental evidence that people's modes of social interaction influence their construal of truth. Participants who engaged in cooperative interactions were less inclined to agree that there was an objective truth about that topic than were those who engaged in a competitive interaction. Follow-up experiments ruled out alternative explanations and indicated that the changes in objectivity are explained by argumentative mindsets: When people are in cooperative arguments, they see the truth as more subjective. These findings can help inform research on moral objectivism and, more broadly, on the distinctive cognitive consequences of different types of social interaction.

Keywords: Objectivity; Social interaction; Cooperation; Argumentation; Meta-ethics

1. Introduction

Social interactions are clearly influential in human reasoning (Doris & Nichols, 2012), and some have even suggested that the primary function of reasoning is social (Mercier & Sperber, 2011). But can the ways we enter into a discussion with others change our basic understanding of the question being addressed? Here we argue that specific types of social interactions can impact the way people understand the nature of truth and disagreement.

Consider two ways of understanding the debate around a controversial topic such as same-sex marriage (see, e.g., Goodwin & Darley, 2008). One view would be that the

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issue is an *objective* one: There is a correct answer made true by the features of the topic, and any other answer must be wrong. Another view would be that the issue is *subjective*: its truth depends on the judgments made by the people considering the topic. We propose that social interactions can influence people's construal of issues like this one. More specifically, we propose that people's construal of the issue will change depending on the mode of social interaction in which they are engaged.

1.1. Interacting with others

One form of social reasoning consists of a group of people searching together for the solution to a problem. Groups pursuing this strategy reap cognitive gains such as quickly identifying problems (Hill, 1982) and discovering the best solutions (Schwartz, 1995). These characteristics allow the performance of the group to go above and beyond the sum of its individual members (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010).

However, group reasoning does not always involve finding solutions to problems. Some group reasoning consists instead of *argumentation* (Walton, 1998). In group reasoning using argumentation, people start out with opposing views on a given question, and each individual proceeds by offering reasons or evidence in favor of his or her own view and against the opposing one.

Argumentation can be carried out in a number of distinct mindsets, where a mindset is defined as a set of goal-directed cognitive processes, including reasoning patterns, which can be triggered by subtle cues. Once active, the procedures of a given mindset are more likely to be applied to the task at hand (Savary, Kleiman, Hassin, & Dhar, 2015; Xu & Wyer, 2008). Argumentation can take place in the argue-to-win mindset or the argue-to-learn mindset. In the argue-to-learn mindset, each person genuinely attempts to discover more about the issue under discussion and to arrive at a more accurate answer. In this mode, argumentation can be an effective way to improve individuals' comprehension (Deslauriers, Schelew, & Wieman, 2011; Lao & Kuhn, 2002; Nussbaum, 2008). But learning is not the only possible goal when engaging in argumentation. In some arguments, the goal is "simply to score points" (Andriessen, 2006). In the argue-to-win mindset, each participant attempts to emerge victorious over the other and has no interest in learning new information or modifying their views. The difference between these two modes of argument is exemplified by the ways in which arguments are used differently by judges and lawyers (Nickerson, 1991). The judge uses arguments to weigh evidence and discern truth, while the lawyer selectively presents arguments to build a particular case. Like other mindsets, environmental cues like social context can alter the mode of argument in which people engage. For example, arguing in a private setting leads to an argue-to-learn mindset, while arguing in a public setting leads more to an argue-to-win mindset (Fisher & Keil, 2012).

Here, we present evidence that the modes of argument change the way that people understand the issues themselves. In particular, these mindsets can affect the degree to which they see an issue as having an objective answer.

1.2. Objectivism

Truth can either be thought of objectively or subjectively. Certain questions clearly have a right answer. For example, when considering the number of restaurants on Main Street, there is one objectively correct answer that is established by facts independent of any particular person's judgment. All other positions are simply wrong. When it comes to other questions, however, there may be no fact of the matter which is established by mind independent facts. Unlike counting the number of restaurants in the example above, claiming that one restaurant's food is better than the others is a subjective judgment because it is true or false in virtue of what a particular speaker is thinking or feeling. Many cases fall somewhere along this objectivity/subjectivity continuum. When it comes to controversial issues relating to public policy, for example, it is not clear if there is an objectively right answer or if the truth is subjective. Our studies focus on cases in this gray area.

Objectivism, specifically in the moral domain, has been discussed extensively in the philosophical literature. Some philosophers contend that when it comes to moral issues, there is an objectively right answer (Shafer-Landau, 2003; Smith, 1994), while others disagree with this objectivist view (Dreier, 1990; Prinz, 2007). Philosophers have generally appealed to folk intuitions as support for their various accounts. In particular, many philosophers have claimed that ordinary people are moral objectivists (Mackie, 1977; Shafer-Landau, 2003; Smith, 1994).

Recently, social psychologists and experimental philosophers have measured how ordinary people understand these issues, but their results have not confirmed the traditional view that ordinary people are objectivists across the board (Goodwin & Darley, 2008, 2010, 2012; Nichols, 2004; Sarkissian, Park, Tien, Wright, & Knobe, 2011; Wright, Grandjean, & McWhite, 2013). On the contrary, existing results suggest that there is not one consistent folk view. Differences in assessments of objectivity exist across individuals, across topics for any given individual, and across different contexts (for a review, see Wright & Sarkissian, 2012). For example, people with different interpersonal attitudes have differing meta-ethical beliefs; those with "closed" responses, such as negative attributions to those with opposing views, tend to be higher in objectivism (Goodwin & Darley, 2012).

1.3. Current studies

Here, we ask if people's intuitions about the objectivity of truth can be affected by their mode of social interaction. In a series of experiments, we demonstrate that the mindset induced by engaging in cooperative or competitive arguments influences objectivity. We propose that people shift their understanding of the truth of a topic to match their goal. Specifically, people see the truth as subjective when trying to learn and as objective when trying to win (Experiment 1). This shift is explained by argumentative mindsets, not any particular feature of the actual interaction (Experiment 2), the phrasing of the

dependent measure (Experiment 3), perspective-taking (Experiment 4), or demand characteristics (Experiment 5).

2. Experiment 1a

Is truth understood more objectively when considered in certain social contexts? We first addressed this question by asking participants to interact directly with each other either cooperatively or competitively in an online chat room before rating the objectivity of truth for the topics of the arguments.

2.1. Methods

2.1.1. Participants

Sixty-one participants (18 female, 43 male; M_{age} = 29.70, SD = 9.88) completed a controversial topics norming study. One hundred and thirty participants (55 female, 63 male, 12 missing; M_{age} = 33.57, SD = 11.23) completed the main experiment online through Amazon's Mechanical Turk Rand (2012). An additional 142 participants served as independent raters. All parts of Experiment 1a were completed through Amazon's Mechanical Turk. Each experiment used a unique naïve sample.

2.1.2. Procedure

In the current studies, participants considered the objectivity of controversial topics because these topics were most likely to lead to an argue-to-win mindset. To identify these topics, participants in a norming study rated how likely it is that they would get into a heated exchange over various topics. The topics with the highest rating from the norming study were included in the main study (see Table 1). In order for the interactions between participants to cover topics for which they had genuine disagreement, participants first reported the position they held for each of the topics on a 1([Position A])–7([Position B]) Likert scale. To be paired, one participant needed to rate at least three of the pre-test topics on the opposite side of the scale as the other. If participants disagreed on more than three topics, the topics for which participants' pre-test ratings differed the most were selected. If participants' ratings were equally different for multiple topics, the topic to be used in the argument phase of the experiment was selected at random.

After completing the pre-test, participants were provided a hyperlink and password to a private online chat room (hosted by the website chatzy.com). Participants waited in the chat room while their pre-test responses were processed in real time. Once two participants were identified as a match based on disagreement in their pre-test ratings, the other non-matches were removed from the chat room so that only the two participants and a moderator (research assistant) remained. The moderator instructed both participants that there would be a total of three exchanges each lasting 4 minutes. Participants earned a small bonus for each argument they completed. In the Competitive condition participants

Table 1
Mean objectivism ratings and standard errors for each topic across Experiments 1a and 1b

Topic	Competitive	Cooperative	Baseline
Same-sex marriage	4.16 (0.43)	3.90 (0.45)	4.88 (0.36)
Teaching evolution	4.91 (0.68)	3.71 (0.58)	4.84 (0.42)
Marijuana legalization	4.06 (0.48)	3.55 (0.78)	4.85 (0.39)
Abortion	5.20 (0.41)	3.11 (0.35)	3.88 (0.28)
Violent videogames	4.35 (0.48)	3.43 (0.62)	4.00 (0.33)
Global warming	4.30 (0.72)	4.00 (0.64)	5.48 (0.28)
Public healthcare	3.97 (0.40)	3.45 (0.36)	4.44 (0.37)
Euthanasia	3.92 (0.38)	3.30 (0.47)	3.84 (0.32)
Gun rights	4.23 (0.45)	3.05 (0.37)	3.88 (0.32)
Wage gap	4.50 (0.65)	3.30 (0.67)	4.15 (0.38)

were told, "You will be justifying your position on 3 issues total (1 issue per exchange) to another MTurk worker who has a strong stance on these issues. This is a highly competitive exchange and your task will be to outperform the other person." In the Cooperative condition, participants were told "You will be sharing your position on 3 issues total (1 issue per exchange) to another MTurk worker who has a strong stance on these issues. This is a highly cooperative exchange and your task will be to learn as much as you can from the other person." The moderator then introduced the first of the three topics, selected at random. There were no significant differences in the frequency of topics between the competitive and the cooperative conditions.

After the argument was finished, the moderator sent a private message to each of the participants asking them to evaluate the following statement on a 1 (Strongly Disagree) to 7 (Strongly Agree) scale: "Earlier studies show that people take opposite positions on the issue of [issue]. Given that people have opposite views, at least one side must be wrong." This measure of objectivism was adapted from previous research which has shown that it is correctly understood by participants as pertaining to the truth of the matter and not the justifiability of a position (Sarkissian et al., 2011). Participants provided their rating as a response in the private message to the moderator. The private messaging interface made it clear that the other participant would not be able to view the objectivity ratings. After two additional 4-minute arguments and objectivity ratings, participants were directed to a final demographics survey.

The transcripts of all the interactions were compiled and evaluated by a separate group of independent raters. The raters judged a random subset of three exchanges on a variety of dimensions. These included several exploratory measures, but also three measures determined beforehand to serve as a manipulation check. To ensure participants followed the directions, independent raters were asked three questions: "How argumentative was the exchange?" "How often did the participants express agreement or understanding with each other on the topic?" (reverse coded), and "How often did the participants simply negate each other's opinions about the topic without offering further evidence?"

2.2. Results

The three-item manipulation check of independent raters' judgments formed a reliable scale ($\alpha = .81$). The independent raters provided higher ratings for the exchanges of participants in the Competitive condition ($M = 4.22$, $SD = 1.10$) than those in the Cooperative condition ($M = 3.41$, $SD = 1.11$), $t(140) = -4.37$, $p < .001$, indicating that participants successfully followed the instructions in the main experiment.

Confirming our main hypothesis, participants in the Cooperative condition rated the topics they discussed as less objective ($M = 3.39$, $SD = 1.67$) than those in the Competitive condition ($M = 4.24$, $SD = 1.71$), $t = 2.80$, $p < .01$, Cohen's $d = 0.50$. For a breakdown of the results by topics, see Table 1.

3. Experiment 1b

Experiment 1a found a difference between the competitive and cooperative conditions, but it was not clear which of these mindsets was driving the effect. To establish the direction of the effect, Experiment 1b did not included any social interaction but only asked participants to provide objectivity ratings for the same set of controversial topics used in Experiment 1a.

3.1. Methods

3.1.1. Participants

One hundred participants (36 female, 64 male; $M_{age} = 33.50$, $SD = 10.69$) completed a paid study online through Amazon's Mechanical Turk.

3.1.2. Procedure

Participants rated the objectivity of a random subset of three of the controversial topics used in Experiment 1a using the same scale used in Experiment 1a.

3.2. Results

Participants' baseline objectivism ratings ($M = 4.44$, $SD = 1.56$) did not differ from the competitive condition of Experiment 1a ($M = 4.24$, $SD = 1.71$), $t(165) = -0.79$, $p = .43$, but they were significantly higher than the cooperative condition from Experiment 1a ($M = 3.39$, $SD = 1.67$), $t(159) = -4.02$, $p < .001$, Cohen's $d = 0.65$. For a breakdown of the results by topics see Table 1.

Baseline ratings strongly correlated with the Experiment 1 norming question ("How likely is it that you would get in a heated exchange on the topic of [topic]?"), $r(8) = .58$, $p < .05$. In light of the findings of Experiment 1a, one plausible interpretation of this correlation is that some topics have a higher objectivity baseline because people more often engage in competitive arguments over those topics than others.

3.3. Discussion

Experiment 1a demonstrated that those in a cooperative interaction provided lower objectivism ratings than those in a competitive interaction. The baseline measure in Experiment 1b then showed that the higher objectivism ratings found for the competitive condition are the default for people considering these controversial topics, suggesting that the argue-to-learn mindset decreases participants' objectivism.

4. Experiment 2

Our hypothesis is that different modes of social interaction trigger different mindsets, which in turn influence people's conceptions of truth. If participants' particular argumentative mindset explains the effect in Experiment 1, then merely *anticipating* a cooperative or competitive exchange should produce the same effect. In Experiment 2, participants prepared an argument for an exchange that did not actually take place. Thus, the relevant mindsets were induced without participants ever interacting with each other. This approach helps establish the influence of modes of argument on objectivism above and beyond any particular features of an actual social interaction.

In this new paradigm, participants produce arguments in anticipation of an exchange, and it could be the case that the content of these arguments, not the argumentative mindset, affects objectivism. For example, when in the argue-to-win mindset, perhaps people first persuade themselves of the strength of their view as they write out arguments for their position and so they later rate the topic as having an objectively correct answer. If this were the case, the change in objectivity ratings would not be due to a shift in their mindset, but rather a strengthening of their view on the topic. To examine this possibility, we asked independent raters to judge the content of participants' arguments. If participants produced equally balanced arguments across conditions, it would suggest that the content of their written arguments is not affecting their objectivity ratings. Additionally, we asked participants to rate their confidence in their position and report their view for each of the topics. These additional measures allow us to assess the degree to which argumentative mindsets uniquely and directly affect objectivism.

4.1. Methods

4.1.1. Participants

Two hundred and thirteen participants (104 female, 109 male; M_{age} = 32.04, SD = 11.43) for the main task and 162 participants (74 female, 88 male; M_{age} = 32.80, SD = 12.24) as independent raters from the United States completed a paid study online through Amazon's Mechanical Turk. Participants completed the main task in 12 minutes on average.

4.1.2. Procedure

Participants were randomly assigned to either the Cooperative or the Competitive condition. In the Cooperative condition, participants received the following instructions, "In this study, you will be sharing your position on some issues to a reader who has a strong stance on these issues. This is a highly cooperative exchange and your task will be to learn as much as you can from the other person. Keep in mind that you will both be trying to understand each other and work toward mutual interests." In the Competitive condition, participants received these instructions, "In this study, you will be justifying your position on some issues to a reader who has a strong stance on these issues. This is a highly competitive exchange, and your task will be to outperform the other person. Keep in mind that you will both be trying to win against each other and work toward outperforming the opposition." Participants were reminded of the instructions before they wrote about each topic. Before proceeding, all participants indicated that they had carefully read the instructions. Participants wrote essays and provided objectivity ratings for a random subset of the following topics from Experiment 1: same-sex marriage, marijuana legalization, teaching evolution in school, abortion, and violence in videogames. After participants completed each essay, they provided an objectivity rating. After the objectivity measure, participants rated their confidence in their position on a 1(not at all)–7(very much) Likert scale and their position on the issue on a 1([Position A])–7([Position B]) Likert scale. Importantly, participants never actually interacted with others.

Each independent rater saw a random subset of 40 essays and responded to the question, "How would you describe the arguments in this passage?" on a scale from 1 (The arguments are all for one side) to 7 (The arguments are totally balanced).

4.2. Results

Again, participants in the Competitive condition gave higher objectivism ratings for the topics they considered ($M = 4.76$, $SD = 1.48$) than participants in the Cooperative condition ($M = 4.33$, $SD = 1.42$), $t(211) = 2.19$, $p = .03$, Cohen's $d = 0.30$. This provided evidence that it is not the actual social interaction that causes decreased objectivism. Instead, the argue-to-learn mindset activated in anticipation of certain social settings is sufficient to elicit less objectivist responses.

To rule out the possibility that the effect arose simply because those in the competitive condition wrote about one side of the issue in their essays, a group of independent raters assessed how balanced the positions were presented in each essay. We found no difference between the essays from the competitive condition ($M = 3.07$, $SD = 1.05$) and the cooperative condition ($M = 3.10$, $SD = 0.90$), indicating that participants in the competitive condition did not focus only on one side of the issue in their essays. This suggests participants' argumentative mindset, not an imbalanced consideration of the topic in their writing, affected their objectivity rating.

Furthermore, we found no evidence that the strengthening of participants' position on the topics led to the change in participants' metacognitive beliefs. Participants' confidence in their view was no greater in the Competitive condition ($M = 6.02$, $SD = 0.87$) than in

the Cooperative condition (M = 6.09, SD = 0.83), $t(211) = -.65$, $p = .51$. Additionally, their reported position on the topics were no different in the Competitive condition (M = 5.23, SD = 1.66) compared to the Cooperative condition (M = 5.54, SD = 1.56), $t(211) = -1.40$, $p = .16$. This result highlights that participants do not necessarily think of their own view as more correct, but instead think it more likely that there is one correct position on the issue.

5. Experiment 3

The dependent measure used in the Experiments 1 and 2 was adopted from previous work assessing objectivism (Sarkissian et al., 2011), but it could lead to potential problems when used in our experimental paradigm. Since the manipulation we used specifically instructs participants to compete or cooperate, perhaps participants in the Cooperative condition are more reluctant to say that "at least one side must be wrong" because labeling another person a "wrong" seems uncooperative. Our theory predicts that people's meta-ethical position, not just their tendency to be adversarial, will change according to their argumentative mindset.

A second issue with the dependent measure is that it may not be clear that we are asking about the metaphysical issue as to whether there is an objective truth about the question under discussion. Instead, participants might interpret the measure as simply asking whether this is a question for which there is only one correct answer versus multiple different correct answers. (For example, if the question had been "Please name a prime number between 1 and 10," there would be multiple different correct answers, but any given answer would still be objectively true or false.)

We designed a new dependent measure to simultaneously address these two concerns. In Experiment 3, we assessed objectivism by asking participants to "Consider the following question: "Should [topic] be allowed?" Please tell us whether you think there is an objectively true answer to this question." Participants responded using a 1(definitely no objective truth)–7(definitely an objective truth). This measure addressed the two potential concerns with previous measure. First, it avoids any personalization of the topic by no longer referring to "sides" or asking if someone "must be wrong." And second, it removes any ambiguity about whether we really are asking about whether there is an objective truth about the topic.

5.1. Methods

5.1.1. Participants

Two hundred and fifty participants (106 female, 144 male; M_{age} = 33.92, SD = 10.69) completed a paid study online through Amazon's Mechanical Turk. A larger sample was used in Experiment 3 because it was plausible that the effect size would be smaller using the revised-dependent measure. Participants completed the experiments in 10 minutes on average.

5.1.2. Procedure

Experiment 3 used the same procedure as Experiment 2 except for the measure of objectivity. The new measure read: "Consider the following question: "Should [topic] be allowed?" Please tell us whether you think there is an objectively true answer to this question." Participants responded using a 1(definitely no objective truth)–7(definitely an objective truth) Likert scale.

5.2. Results

Replicating the previous findings, participants in the Competitive condition rated the topics as having more of an objective truth ($M = 5.33$, $SD = 1.42$) that those in the Cooperative condition ($M = 4.85$, $SD = 1.50$), $t(248) = 2.49$, $p = .01$, Cohen's $d = 0.32$. This result replicates our main finding from the previous experiments and suggests that participants were correctly interpreting the original measure. Furthermore, it provides evidence that the difference in ratings across conditions is not due to an attempt to follow the directions and be less antagonistic, but to a shift in how one understands the underlying nature of truth for a particular topic.

6. Experiment 4

One possible explanation for the result obtained in Experiments 1–3 is that the social interaction manipulation changed participants' understanding of the other person, not the argument itself. Perhaps the instructions to interact cooperatively led to more perspective-taking and subsequently a greater appreciation for the truth as subjective. If this was the case, the mechanism underlying the effect of the previous experiments would not be the construal of the argumentative interaction to match one's goals, but the construal of other minds and an increase in the appreciation of an opposing view. To examine this possibility, Experiment 4 directly tested the relationship between perspective-taking and objectivism.

6.1. Methods

6.1.1. Participants

One hundred and ninety-nine participants (89 female, 110 male; $M_{age} = 34.84$, $SD = 9.72$) from the United States completed a paid study online through Amazon's Mechanical Turk. Participants completed experiment in seven minutes on average.

6.1.2. Procedure

Participants were randomly assigned to the perspective-taking or the no perspective-taking condition. Participants were instructed that they would be interacting with someone who disagreed with them about a series of topics. Participants in the perspective-taking condition were told that before their discussion began they would answer a series of

questions about the topic as if they were the person with whom they disagreed. Furthermore, they were told they would be eligible for a payment bonus if their answers correctly lined up with the other person's actual responses. Participants in the no perspective-taking condition responded to the same questions but from their own perspective.

Participants completed four questions about the topic either from their own point of view or from the opposing point of view. For example, participants would respond to the question, "A high quality education for children should be a priority. How would you [the person who disagrees with you] respond?" For each topic, two questions were designed to take the perspective of one side, and two questions were designed to take the perspective of the other side (see Appendix S1 for the full set of questions). In the perspective-taking condition, these questions could not be answered by simply giving the opposite of one's own response; they required actually taking the perspective of someone who holds the opposing view. After answering the four quiz questions, participants were asked to "please present your position on the topic" for three randomly ordered topics (teaching evolution in schools, abortion, gun rights). After writing each short essay, they then rated their understanding of the truth of the topic using the same scale as Experiments 1 and 2.

6.2. Results

The responses to the quiz questions served as a manipulation check to ensure that participants actually gave different answers when considering how someone who disagrees with them would respond. Examining both viewpoints on the four questions for each of the three topics, there was a significant difference (mean perspective-taking—mean no perspective-taking) between the responses of those answering from their own perspective and those answer from the opposing perspective, $t(23) = 7.65$, $p < .001$, Cohen's $d = 2.62$. This result indicates that participants were indeed following the instructions of the experiment and considering the other view in the perspective-taking condition.

While the manipulation successfully induced perspective-taking, it did not lead to a difference in objectivity ratings. Participants in the perspective-taking condition rated the objectivity of the topics the same ($M = 4.48$, $SD = 1.56$) as participants in the No perspective-taking condition ($M = 4.47$, $SD = 1.55$), $t(197) = 0.04$, $p = .97$. This suggests that increased perspective-taking does not explain the effect of argumentative mindset on objectivity ratings.

7. Experiment 5

Finally, one might wonder whether the difference in objectivity ratings in the previous experiments reflected a genuine effect on people's judgments or whether it was merely the result of a self-presentational shift. Participants may be able to guess that the hypothesis of the experiment pertains to the win/learn instructions and the objectivity ratings. If

so, then the difference between conditions could be explained by participants' desire to signal to the experimenter that they are properly following the instructions. Can our findings be explained by this demand effect? To answer this question, Experiment 5 used the anticipated interaction paradigm from Experiment 2 but made two changes. First, participants were told their objectivity ratings would be stored anonymously and not be linked to their performance in the argument. Second, at the end of the experiment, participants guessed the purpose of the study. These responses could be used to deduce whether signaling strategies may have influenced participants' performance.

7.1. Methods

7.1.1. Participants

Two hundred and fifty participants (89 female, 161 male; M_{age} = 33.74, SD = 10.69) from the United States completed a paid study online through Amazon's Mechanical Turk. Participants completed experiment in ten minutes on average.

7.1.2. Procedure

Experiment 5 followed the same procedure of Experiment 2, except for two changes. First, after each essay (immediately before each objectivity question), participants were told, "Your ratings to the following questions will be stored anonymously and will not be linked to your performance in the exchange." At the end of the experiment, a comprehension check question verified that participants understood the new instructions. Second, at the end of the experiment, participants were asked, "What do you think was the purpose of this study?"

7.2. Results

No participants accurately guessed the hypothesis of the experiment. In fact, no participants mentioned any link between the compete/cooperate instructions and the objectivity ratings. The majority of participants gave a broad answer such as "to gather opinion on controversial topics" or simply did not know the purpose of the study.

Again, participants in the Competitive condition provided higher objectivity ratings (M = 4.65, SD = 1.51) than participants in the Cooperative condition (M = 4.08, SD = 1.47), $t(248)$=3.06, $p < .01$, Cohen's d = 0.38. The effect remains significant when participants who failed the comprehension check question about the anonymity of responses are excluded from the analysis. Experiment 5 successfully replicated the previous findings and ruled out the possibility of demand characteristics.

8. General discussion

Five studies provided converging evidence that interacting with others has consequences for naïve understandings of truth. Experiment 1 demonstrated that in cooperative

interactions, people are less objectivist when considering their views on controversial topics. The remaining experiments then addressed a series of alternative hypotheses, including the actual content of the interaction (Experiment 2), the specific measure we used to assess objectivism (Experiment 3), potential differences in perspective-taking (Experiment 4), and demand characteristics (Experiment 5). In sum, people change their evaluation of truth to be consistent with the goals of their particular argumentative mindset.

8.1. Implications for the study of objectivism

Researchers at the interface of psychology and philosophy have recently begun to identify the psychological processes that lead to either objectivism or subjectivism (Goodwin & Darley, 2008, 2010, 2012; Young & Durwin, 2012). Argumentative mindsets cued by certain social contexts are an influential factor. The present results suggest that the argue-to-learn mindset leads to decreased objectivism. Arguing to learn involves an openness to alternative points of view which appears to facilitate a more subjectivist understanding of truth. A "closed" argue-to-win mindset would prevent this sort of understanding, but when one is trying to learn, adopting a subjectivist mindset leads one to think that the other point of view contains elements of truth.

Earlier research suggests subjectivism arises from a tendency to take alternative perspectives (Sarkissian et al., 2011). However, when we directly manipulated perspective-taking in Experiment 3, we found no evidence that it affected objectivism. Indeed, considering argumentative mindsets might actually provide an explanation for some of the results that motivated the earlier suggestion regarding perspective-taking. For example, participants adopt more subjectivist views when considering disagreements between people from radically different cultures (Sarkissian et al., 2011). It has been previously suggested that vignettes about different cultures lead participants to actively consider alternative ways of life and so the manipulation increases perspective-taking and therefore decreases objectivism (Sarkissian et al., 2011). The present results, however, support an alternative theory. When considering other cultures, there is no reason to enter an argue-to-win mindset, but in fact, a reason to try to actively learn from those who are very different. Thus, the prevalence of subjectivism in discussions of cross-cultural difference may be explained by a motivation to learn from people from other cultures, at least regarding certain sorts of topics. When participants begin thinking about the positions of people from distant cultures, they feel more cooperative, enter the argue-to-learn mindset, and, hence, do not feel the same pull toward objectivism.

Our studies facilitated interactions where people dealt only with highly controversial topics. Other modes of interaction do not have this character and would lead to different outcomes. For example, when people consider uncontroversial topics like charitable giving, priming an objective view of morality leads to increases in participants' donations (Young & Durwin, 2012). It is also possible that the prospect of interacting with strangers like the participants in our studies readily leads to a winning mentality because there is a lack of familiarity and trust. Perhaps interactions with familiar or trusted conversation

partners would shift the default mindset. These possibilities remain important topics for future research.

Another promising direction for future research would be to examine the downstream behavioral consequences of the argumentative mindsets. Exposure to moral subjectivism can lead to immoral behavior (Rai & Holyoak, 2013); so perhaps the argue-to-learn mindset could lead to similar results. Additionally, future research can investigate the generality of our manipulation. The present studies show that entering an argue-to-learn mindset with regard to a particular topic changes people's understanding of truth for that particular topic. Future research could ask whether it also leads to a more general effect whereby people's understanding of truth shifts for other topics as well.

8.2. Implications for social influences on cognition

More broadly, the present experiments illustrate contrasting ways in which social interactions influence cognition. Interacting in a socially cooperative setting affected participants' central aspects of their conception of the issue under discussion. The present experiments focused on interactions that trigger the argue-to-learn and argue-to-win mindsets and we examined the impact of these mindsets on intuitions about objectivism, but research could also examine other such effects. For example, previous work has shown that the argue-to-win mindset also lead to seeking interlocutors with high knowledge and producing better quality arguments (Fisher & Keil, 2012). The argue-to-win mindset may have its own set of distinct consequences, which would not necessarily be negative. In certain cases, trying to win in an argument might be a good long-term strategy because it challenges weaknesses in an opposing view and serves to help refine and eventually strengthen the coherence of the position. If determined opponents vet an argument, the argument could very well improve over time.

One such effect is especially relevant in the present context. For moral beliefs, objectivism is related to "closed" responses. Even when controlling for the strength of belief in a particular moral question, objectivism corresponded to less comfort in disagreeing with others, increased judgments of immorality in those who disagree, and less willingness to change belief (Goodwin & Darley, 2010). In light of the present findings, the impact of the argue-to-learn mindset might be best understood in terms of this broader notion of being less "closed." Perhaps entering into an argue-to-learn mindset leads to a whole suite of different "open" responses of which subjectivity is merely one part. Future studies could examine if a desire to learn affects these other measures.

8.3. Conclusion

We demonstrated that the character of people's social interactions influences their understanding of truth. This finding has implications at two levels. On a direct level, it provides information about the factors that influence people's intuitions about objectivism and subjectivism in particular. Then, at a more indirect level, it may serve as a case study in a broader inquiry into the ways in which social interaction can influence people's

mode of cognition. Further research might expand that inquiry by looking at other ways in which different types of social interaction can impact people's mode of cognition and thereby lead to differences in their construal of the issue at hand.

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Supporting Information

Additional Supporting Information may be found online in the supporting information tab for this article:

Appendix S1. Perspective-taking questions.