Can Tailored Value Appeals Correct Misconceptions about Scientific Controversies and Motivate Online Commenting to Promote Consensus Among Scientists?

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Specific Aims

The American public’s risk perceptions of scientific issues systematically deviate from consensuses among scientists, in cases such as genetically-modified food, vaccinations, and global warming (Pew, 2015). Such deviance from a rational information-processing model for risk perception formation has prompted scholars to examine alternative theoretical accounts such as motivated information-processing and reasoning (Druckman & Bolsen, 2011; Kahan, 2013; Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012; Taber & Lodge, 2006); and human beings’ predisposition to observe core values and moral principles represents an important source of motivation (Haidt, 2007; Ryan, 2016). A value appeal frames an issue position and a behavior as consistent or inconsistent with a cherished personal value or moral principle, hence situating the interpretation of factual information in light of one’s value structure (Blankenship, Wegener, & Murray, 2012; Nelson & Garst, 2005). For scholars interested in risk perceptions of scientific controversies, values upheld by people are typically studied as a personality trait (Kahan, Braman, Cohen, Gastil, & Slovic, 2010; Nisbet, Cooper, & Ellithorpe, 2014; Scheufele, 2014); and the persuasiveness of value appeals has yet been garnered to correct misconceptions. On the other hand, psychologists under the framework of Moral Foundations Theory (Graham et al., 2011; Haidt, 2012) have already compared tailored versus mismatched value appeals in a variety of contexts, and have shown the persuasiveness of the former (Feinberg & Willer, 2012, 2015). However, they have yet compared fact-only messages with those augmented by tailored value appeals in the context of correcting misconceptions about scientific controversies. Therefore, **Aim 1 of this study is to examine whether framing issue position on genetic engineering (hereafter referred to as GE) as consistent with one’s endorsed moral value could help forming opinions supporting GE, above and beyond scientifically correct facts.** I focus on GE because among the set of scientific controversies surveyed, Pew (2015) shows the largest gap between the public’s and scientists’ opinion on safety of genetically modified food—an issue closely related to GE.

**Aim 2 is to further test whether tailored value appeals can motivate individuals to craft messages to argue against science deniers as the perceived majority.** The public discourse on scientific controversies, especially on the Internet, could be undesirably dominated by committed science deniers even as the actual minority in population, if discursive participation from the reticent majority is lacking. One established factor that could suppress pro-science commenting is known as the “spiral of silence” (Noelle-Neumann, 1991; Price, Nir, & Cappella, 2006), which is a result of perceived normative pressure when clusters of science deniers disproportionately make more comments. Despite its well-documented negative consequences (David, Cappella, & Fishbein, 2006), few studies have examined means to break the spell of the “spiral of silence”. I argue that a feasible way is to use tailored value appeals to strengthen scientifically correct factual information. Tailored value appeals are expected to increase moral conviction of issue position, hence providing psychological standing to argue against the dominant group (Effron & Miller, 2012; Skitka, Bauman, & Sargis, 2005). It is expected that tailored value appeals can help individuals resisting normative pressure from committed science deniers, and thus encourage socially diffusing and amplifying scientific facts during online social interactions. Findings from Aim 2 can shed light upon effective ways to contribute voices reflecting scientific consensus to the public discourse on scientific controversies.
Method

To address Aim 1 and Aim 2, I propose a 2 (Message Feature: Fact-only vs. Fact + Tailored Value Appeal) * 2 (Status of Science Deniers: Minority vs. Majority) between-subject experimental design (see Table 1). This study will focus on GE as a controversial scientific issue (Pew, 2015). To simulate the experience of interacting with misinformed GE opponents either as a dominating majority or minority, I will display both pro- and anti-GE comments and vary the ratio. In the condition where GE opponents are the majority, the ratio of anti- to pro-GE comments will be 3 to 1; and in the minority condition, this ratio will be reversed to 1 to 3. The protocol of experiment is shown below.

![Flow Chart]

I will prepare experimental stimuli for this study by modifying GE-related news, opinion editorials, and user-generated comments gathered from online sources. I will create multiple messages per value category in order to improve external validity—that is to make claims about theoretical categories rather than specific messages (Jackson, 1992). Given the sample size (see Table 1), I am targeting approximately 10 messages per cell in the 2 (valence: pro vs. con) * 2 (scientific validity: consistent vs. inconsistent with consensus) * 5 (moral values: care, fairness, in-group loyalty, tradition, and purity) classification table. Categories for moral values are directly taken from the well-established Moral Foundations Theory (Graham et al., 2011). I will screen messages for their scientific validity by checking statements issued by professional associations of scientists; and I will create the fact-only version by manually removing the normative claim from verified messages that originally include some value appeal.

In addition to demographic variables, the pre-survey will measure participants’ endorsement of five moral values (via the Moral Foundations Questionnaire, Graham et al., 2011). After taking the pre-survey, each participant will be randomly assigned to one of the four experimental conditions. All messages used during the first message exposure stage (Box 2 in the flow chart) will take a pro-GE position, have been fact-checked, and be similar to opinion editorials in format and style. For a participant randomly assigned to receive a tailored value appeal, the message will make an argument that explains why taking a pro-GE position is consistent with the top-ranked moral value the participant endorses, in addition to presenting factual information about GE. The corresponding fact-only version of this message will then be assigned to a randomly picked participant in the fact-only message condition. Next, depending upon whether a participant is to view GE opponents as minority or majority, she will receive a randomly ordered message set either consisting of 1 anti-GE plus 3 pro-GE comments or 3 anti-GE plus 1 pro-GE user-generated comments, respectively. Anti-GE comments will be randomly picked from the group of scientifically invalid messages across moral value categories. Lastly, participants will be asked to craft their own comments, which will be analyzed as the main behavioral outcome. I choose to measure opinion/belief change before viewing anti-GE comments because previous research has shown contaminating effects of negative comments on persuasiveness of the original message (Shi, Messaris, & Cappella, 2014).
References


