

Analyzing People's Views of Science Though Their Categorization of Television Science Programs

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Abstract: In this study, participants view representations of science from television programs and categorize the show's characters as "scientists" or not. Follow-up interviews reveal that when thinking about the science and knowledge claims in the television shows, participants adopt one of two views about scientists: either "process-dominant" (scientists as people who investigate claims using some process) or "persona-dominant" (scientists as people who have a specific look, demeanor and credentials).

Introduction

The argument is often made that, in a democracy, an understanding of the nature of science is necessary for people to participate fully as informed citizens (Driver, Leach, Millar & Scott, 1996; Sandoval, 2005). In concert with this argument, I suggest that if we want to uncover the views people hold about the nature of science we should do so in contexts where they actually interact with public claims of scientific knowledge. The NSF finds that about 40% of US adults primarily get their information about science and technology from television (National Science Board, 2008); therefore it seems reasonable to use science-based television shows as a context in which to explore people's views on the nature of science. In this study, I have chosen two popular shows, *Mythbusters* and *Ghost Hunters*, which make arguments and claims that are presented as scientific. How might a viewer interpret the differing methods, attitudes, and unusual versions of science presented by *Mythbusters* and *Ghost Hunters*? And what might these interpretations reveal about the viewer's views on the nature of science?

Theoretical Background

For several decades, researchers have attempted to understand exactly what views people have about the nature of science, both as a practice and as a source of knowledge. A great deal of research is done through questionnaires that overtly ask participants what they think science is, and how it works (e.g., Lederman, Abd-El-Khalick, Bell, & Schwartz, 2002). This research often argues that people hold relatively concrete ideas about the nature of science, often seen to run from *naïve* (e.g., scientific knowledge as absolute) to *informed* (e.g., scientific knowledge as tentative). While this prior research has identified some broad trends in how people view science in school, the various methodologies used to probe those views rely on tacit assumptions that may not be accurate or useful for understanding how people make sense of science outside of school. Some researchers (Leach, Millar, Ryder, & Séré, 2000; Elby & Hammer, 2001; Hammer & Elby, 2002) have argued that much of this research incorrectly assumes that views of science are articulable and consistent across contexts. According to Leach, et al., (2000) there is no evidence that a person's responses to *generalized* questions about the nature of science can be used to predict the knowledge drawn upon by the person in a *specific context*. I go further in arguing that studies that do attempt to localize questions in a context (e.g., Leach, et al., 2000) do not go far enough. These marginally contextualize studies often do not: 1) Have a real world familiarity or significance. 2) Supply participants with the underlying arguments of real world scientific claims. 3) Portray a diversity of scientific methodologies (Sandoval, 2005). Therefore, I have chosen to use two television shows as the contextual basis of my study. These shows (*Mythbusters* and *Ghost Hunters*) reflect authentic popular representations of "science," are consequential to the viewer in that the topics are familiar, and construct an argument (each using a different method) and a resultant claim of knowledge.

Method

There were eight participants for this study: four adults (3 females, 1 male; aged 41-47) and four children (2 females, 2 males; aged 11-14.) Each participant viewed a 20-minute clip from both *Mythbusters* – experiments about whether a penny dropped from a skyscraper can kill a person – and *Ghost Hunters* – collection of video and audio recordings in an allegedly haunted tavern. Clips were counterbalanced to control order effects. After each clip, the participant was interviewed about the specific show they had just seen. The interview protocol used was divided into three sections: 1. An introductory set of questions. 2. A set of questions intended to draw out some of the participants' opinions about how the shows' methods and evidence. 3. A set of questions designed to elicit the participants' views of scientists.

Analysis & Results

Interviews were transcribed and labeled on a spectrum from naïve to informed understanding of science. While I was able to find many cases where the participants' responses seemed to fit these categories, there seemed little consistency within interviews, demonstrating that individual pieces of evidence activate different ideas about science. Furthermore, this top-down approach left an unacceptable number of responses unable to be categorized. Therefore, I took a more bottom-up approach and analyzed the nature of single responses and what larger patterns emerged from them.

Based on this analysis, it seems the participants held one of two very different views of science. One group claimed neither the Mythbusters nor the Ghost Hunters were scientists while the other concluded both were scientists. Participants were evenly split (4 each) into the two groups. These two groups have been labeled *Persona-dominant* or *Process-dominant* based on the very different benchmarks each group used to categorize the shows. The members of the Process-dominant group, which felt both shows were science, seem to place a premium on the process and actions a scientist goes through. This group viewed scientists as anyone who used the scientific method (or a caricature thereof). For example, one participant stated plainly when asked whether or not the Mythbusters were scientists: "They start out with a question if a myth is right or wrong and then they go test it which is kinda like what the scientific method is. You have a question and you try to answer it." Likewise, the plausibility of the existence of ghosts did not matter to this group; they all concluded the Ghost Hunters were scientists because of the *process* they claimed to employ, not due to the plausibility of the target studied.

The Persona-dominant group, however, were more interested in what a scientist looks like and where the scientist works. Members of this group were particularly dubious of the fact that neither the Mythbusters nor the Ghost Hunters display any credentials: One claiming, "I would have felt better if they'd said, 'So-and-so is from MIT and so-and-so is from Harvard.'" The Persona-dominant group view scientists as professionals, working in a sterile lab and doing their job in a very serious way, as evidenced by one member of this group asserting, about the Mythbusters, "I think they're guys who are, um, probably pretty crafty about figuring out ways to do different things... I was going along with them up till the part they started goofing around."

What is striking about the fact that each participant fell into one of two categories is that not one of them made any real distinction between the two shows. For these participants, at least, determining if something is science or not is a relatively surface level task. The Persona-dominant group saw people that violated their prototypical image of a scientist and thus decided they could not be scientists. While the Process-dominant group made similar surface level determination by deciding anyone seeming (or claiming) to employ a method must be a scientist, and no one in this group dug deeper to determine the specifics of the given method and critically evaluate its validity.

Conclusion

This small study raises interesting questions about how people view science, and how researchers attempt to uncover those views. Through the categorization of television scientists it became clear that for some participants the process a scientist goes through was more important than what the he or she looked like or was testing. On the other hand, other participants were much more interested in the persona of the character presented as a scientist. These views seem much different, and much more pliable, than views uncovered in previous (decontextualized or marginally contextualized) research. However, this study says little about how these views actually impact how people evaluate claims to scientific knowledge. In future research, I hope to explore this question more fully.

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