The Role of Epistemic Cognition in Socioscientific Decision-Making

Jordan D Bader and Melissa L Aikens
Department of Biological Sciences, University of New Hampshire, Durham, NH

Background

- Socioscientific issues (SSIs) are controversial scientific issues with social implications. Epistemic cognition influences how an individual understands, interprets, and utilizes scientific information when faced with an SSI.
- Epistemic cognition provides a selection process where an individual may choose from a variety of beliefs, resources, and knowledge when making a decision, forming an opinion, or creating an argument (Chinn *et al.,* 2014; Greene *et al.,* 2016; Sinatra, 2016).
- Information about SSIs is readily available through various forms of media ranging from social platforms to scientific journals (AAAS,2011; Zeidler and Nichols, 2009; Greene *et al.,* 2016). Because of this availability, it is important to understand how students are determining which information sources are reliable when confronted with SSIs.

Research Question

How does epistemic cognition influence socioscientific decision making in non-science and science majors?

Methodology

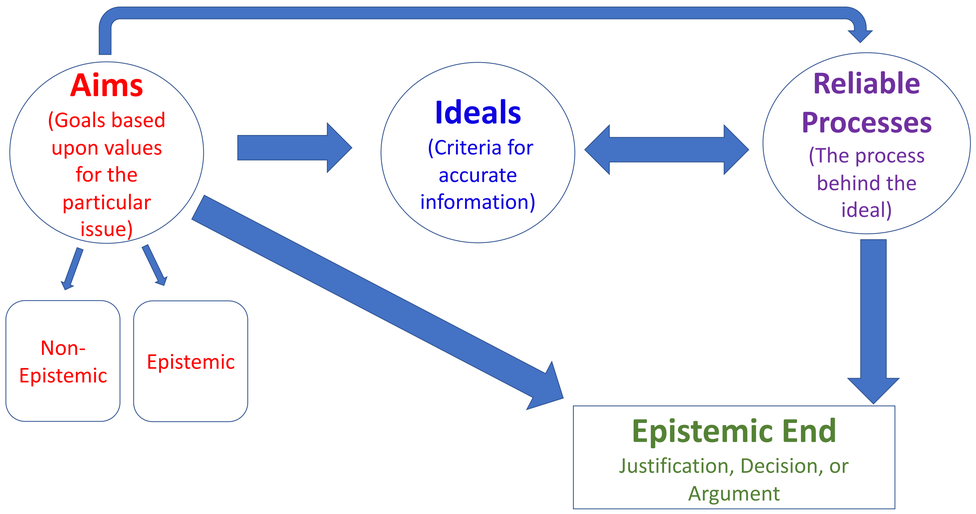
- Through 30-minute semi-structured interviews, participants are asked about their opinions and decisions about vaccinations

Interview Protocol:

- Answer questions regarding opinions about vaccinations
- Read article listing the pros and cons of vaccination (Procon.org, 2019)
- Answer questions about the credibility of the article
- Make hypothetical decisions based upon opinions about vaccinations

- 17 Students have been interviewed thus far. Only 6 of these have been analyzed
- Interviews are analyzed through an Interpretive Phenomenological Analysis

The AIR Model of Epistemic Cognition (Chinn *et al.,* 2014)



Preliminary Results

Major	Aims	Ideals	Processes	Epistemic End
Social Work • Sophomore	Seeking true information that is not misleading	Information that is concrete and clear	Primary sources (peer-reviewed)	This individual would vaccinate their children based off of personal experiences
Social Work • Sophomore	To be informed with the right information	Information from experts within the field	Doctors, PhDs., individuals with a relevant advanced degree	This individual would vaccinate their children based off of their personal beliefs
Environmental Science • Sophomore	Seeking accurate real-world examples	Information from the internet and experts in the field	The amount of education and readily accessible information	This individual would vaccinate their children based off of their personal beliefs
Wildlife Conservation Major • Sophomore	Preservation of self-beliefs (non-epistemic aim)	Factual consistency across information sources	The speed at which information is available	This individual would vaccinate their children based off of personal beliefs

"I'm just trying to find out the most real information…I want to know the facts that cannot be easily turned into something"
"I would like 'this happens when this happens'…I'm very 'clean and clear' kind of thing."
"The books [medical books] are primary sources and we talked about that in bio class. They are not secondary sources where information could be changed throughout"
"I will definitely do it because all of my siblings, I have three other siblings, and they were all raised on vaccinations. We never had anything serious with vaccinations…"

Emerging Themes

1. Students are most likely to consider an information source credible if it aligns with their biases, opinions, and content knowledge
2. There is a broad theme of disconnect between science within the classroom and science within society

Next Steps

1. 23 additional students need to be interviewed for a total of 20 science majors and 20 non-science majors
2. All interviews will be analyzed through an Interpretive Phenomenological Analysis in order to uncover underlying themes

Implications for Teaching and Learning

- The results from this study may depict how cognitive processes are contributing to how students are thinking and learning about science
- The results from this study may provide insight into how students are considering information sources to be accurate when thinking about SSIs

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