The Self-efficacy for Public Engagement with Science Scale

What is self-efficacy?

Self-efficacy is the beliefs people hold about their ability to succeed in certain pursuits (Bandura, 1986). Within the context of science communication, self-efficacy is a primary motivator among scientists who participate in public engagement with science (PES) activities (Dudo & Besley, 2016).



Please indicate the degree to which you agree or disagree with the following statements.

- 1. I am able to create props/activities/demonstrations that participants find engaging.
- 2. I have a hard time finding PES topics that people connect with.
- 3. I find it difficult to leave time for people to share their perspectives during PES activities.
- 4. I have a hard time finding the right words to convey my message during PES activities.
- 5. I am good at thinking together with PES attendees about science topics.
- 6. I am good at knowing when to inform and when to listen during my PES activities.
- 7. I am able to figure out how to improve PES activities based on the kinds of questions the public asks.
- 8. I am able to engage in critical discussion about science topics with non-scientists.
- 9. I am able to moderate discussions with participants, even when they include a wide range of perspectives.
- 10. I am good at reading the audience during PES activities, and making adjustments as needed.
- 11. I am good at finding ways to approach difficult topics.
- 12. I have a hard time answering questions from non-scientists in ways they understand.
- 13. I am able to moderate discussions that allow participants to engage with me and with each other.

Items were rated on a 6-point scale: Strongly disagree, Moderately disagree, Mildly disagree, Mildly agree, Moderately agree, Strongly agree.

Potential Uses Describe baseline levels of self-efficacy for PES among scientists Provide a reflection tool for scientists involved in a communication training or intervention Measure pre-post change in self-efficacy across time Scoring Items 2, 3, 4, and 12 must be reverse coded Check the reliability of the scale with your group of scientists using Cronbach's alpha If the scale is reliable, create an average score for each scientist





Step 1: Think-aloud Interviews



25 scientists completed think-aloud interviews to describe their understanding and responses to 30 possible survey items.

Interviews lasted 20 and 25 minutes.

19 items were found to be intuitive for scientists and provided a wide range of responses.

Step 2: Survey Data Collection

N=297 scientists who had conducted PES in the past year.

All PES categories from the AAAS logic model were represented; half were Public Dialogue.

Scientists had up to 20+ years of PES experience; most had done PES for 1-10 years.



Step 3: Analysis



Item response theory and graded response models were used to validate items.

The scale was reduced to 13 items that have classically adequate reliability for a wide range of scientists (self-efficacy scores at +/- 2.5 standard deviations from the mean).

The average score on the scale was 4.64; scientists' scores ranged from 2.46 to 6.

Robertson Evia, J., Peterman, K., Cloyd, E., & Besley, J. (2017). Validating a scale that measures scientists' selfefficacy for public engagement with science. International Journal of Science Education - Part B: Communication and Public Engagement. Retrieved from http://www.tandfonline.com/doi/full/10.1080/21548455.2017.1377852.

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