Gender and Nanoscientists: The Public Communication of Nanotechnology

Hannah Oros
Media and Communication, Global Health, Muhlenberg College

NNIN REU Site: Microelectronics Research Center, The University of Texas, Austin, TX
NNIN REU Principal Investigators: Dr. Anthony Dudo and Dr. LeeAnn Kahlor, Department of Advertising and Public Relations, University of Texas at Austin
NNIN REU Mentor: Allison Lazard, Department of Advertising and Public Relations, University of Texas at Austin
Contact: hannah@oros.org, dudo@utexas.edu, kahlor@austin.utexas.edu, lazard@utexas.edu

Abstract:

The public communication of science and technology (PCST) — i.e., communication between scientists, the media, and society — is critical to enhance discourse about emerging technologies. The changing media landscape calls for a reexamination of PCST and nanotechnology. Although imperative, scant research has examined the role gender plays in nanoscientists' PCST engagement. Using a multi-wave online survey, this study examined how nanoscientists use new media to engage in PCST. The Theory of Planned Behavior was used to understand how subjective norms operate in predicting PCST engagement across gender [1]. Penultimate study results suggested that PCST perceptions and behaviors vary between male and female nanoscientists.

Introduction:

Nanotechnology is an emerging technology vulnerable to public opinion and shifts in discourse, which can influence its future applications. PCST allows for sources of scientific knowledge to inform the public, building a foundation for better decision-making regarding nanotechnology policies and regulations. Traditional forms of PCST, such as print media, have had limited success dispensing information to an audience through the deficit model [2]. Decision-making requires more than information dispersal; it should be dynamic, interactive, and include the voices of nanoscientists. The media landscape is changing; new media is arguably more interactive, which has the potential to empower the public to participate and be engaged. This paper provides an assessment of nanoscientists' PCST through new media technologies and examines the predictors of this behavior across gender. Studying gender is important within the nanotechnology because it is male-dominated.

The Theory of Planned Behavior is used to understand the PCST predictors by examining subjective norms, which are perceived social pressures and extrinsic rewards [1]. Subjective norms are perceptions of social influence encouraging one to act on or not act on a behavior and create normative beliefs, which are socially constructed codes of conduct. Normative beliefs are gendered and can thus influence behavior, potentially creating gender differences in PCST [1].

Methods:

Data was collected through a multi-wave e-mailed online survey. A list of 995 nanoscientists was provided by NNIN with contact information dated three years ago; we verified and corrected as much information as possible. The sample size was 65 nanoscientists; the response rate was 6.56% when the data was collected. Responses were excluded from the sample size if the respondents did not indicate their gender. One respondent selected their gender as "Not listed." Fifty respondents were male; fourteen were female. The gender ratio was representative. The data was analyzed using SPSS software.

Results:

The female nanoscientists' reported frequency of new media use (blogs, online forums, social networks, micro-blogging sites, and video-sharing) to communicate about science was generally higher than the male nanoscientists'. Female nanoscientists use social networking to communicate about science more than male nanoscientists. Female nanoscientists are almost twice as likely to use micro-blogging sites to communicate about science than male nanoscientists; however, the frequency of micro-blogging usage was low. There were almost no gender differences regarding PCST and video-sharing and blog usage.

Male nanoscientists were more likely than female nano-scientists to communicate using new media platforms to target the audience of media professionals, while female nanoscientists were more likely than male nanoscientists to

target non-scientists. All female nanoscientists, when using new media platforms to communicate about science, target a non-scientist audience. In contrast, almost one-third of male nanoscientists did not communicate using new media platforms toward a non-scientist audience. Female nanoscientists were approximately twice as likely to have helped plan or conduct a public information campaign than male nanoscientists. Almost one-quarter of male nanoscientists had written an article for the popular media, while zero female nanoscientists had done the same.

No female nanoscientists reported that when corresponding with the media or engaging in PCST related to their research, critical reactions from peers, heads of department or organization and the public were very unimportant. Female nanoscientists place greater importance on these critical reactions than their male counterparts. Female nanoscientists perceive a greater amount of job support and importance in the use of new media platforms to communicate about science. Enhanced personal reputation among peers when corresponding with the media or engaging in PCST was found to be statistically significant; almost three-quarters of female nanoscientists rated it as important and female nanoscientists did not assign any degree of unimportance.

Conclusions:

This study provides a preliminary understanding of nano-scientists' PCST activity using new media and it explores the relationships of gender and subjective norms. Female nanoscientists use new media platforms more often than their male counterparts and perceive more organizational support for using new media to communicate about science. Male nanoscientists have more contact with media professionals and place less importance on the critical reactions when engaging in PCST or corresponding with media professionals. Ultimately, PCST perceptions and behaviors vary between male and female nanoscientists.

Limitations and Future Research:

A limitation of this study was the low response rate and small sample size. This is due to several reasons: lacking up-to-date contact information on the provided list and including them on the e-mail list, time constraints of nanoscientists to finish the survey, and the ongoing nature of the survey.

In future research, the measurement of gender can be more inclusive and incorporate a box to type in one's gender. Future research includes examining the correlation between age, gender, and new media use. An area for future research is studying the relationships between other determinants of the Theory of Planned Behavior, e.g., attitude towards the behavior and perceived behavioral control. Finally, the societal implications of gender differences in PCST engagement should be researched.

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