

Gender, Mathematics and Popular Culture

Dr. Sarah

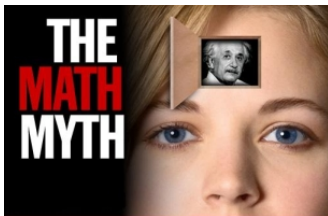
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- 💡 Sketch what you think might be a common response and share your sketch with a neighbor.

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We know that girls are discouraged in the U.S. where too often math is considered not only gendered male but innate in a funny way... When I referred to the math problem in Japan, nobody could figure out what I was talking about... Nobody could fathom the idea that if learning higher math didn't come easily, you weren't supposed to continue... to work harder. It became clear that Japanese women had very different career opportunities than men, but it had nothing to do with some concept of a math gene. (Lazarus, 2001)

Why do Research in this Area?

- *For the U.S. to maintain its global economic leadership, we must ensure a continuous supply of highly trained mathematicians... as well as a scientifically, technically, and numerically literate population* [American Competitiveness Initiative, 2006]
- Math gap disappears in countries with greater gender equality
- Stereotype vulnerability example 1: White men performed worse on a test of mathematical abilities when reminded of Asian-Americans' superior performance in mathematics (Aronson, 1999).
- Stereotype vulnerability example 2: Asian women performed better on a mathematics test when 'cued' as Asians, but they performed worse when their gender identity was 'cued' (Shih, 1999).

Popular Culture “Models”

- In the absence of real-life role models, Children (Steinke, 1998; Swan, Meskill & Demario, 1988) and adolescents (Signorelli, 1990, 1993; Huston & Alvarez, 1990; Wroblewski & Huston, 1987) learn about the workplace and about scientists from television and the popular media.
- Mathematicians are invisible to middle school children who, when they do have images of them, often portray them in a stereotypical way as male nerds and social loners (Picker & Berry, 2002).
- Students perceive mathematics as a discipline that is done by others rather than people like themselves. The ‘others’ may be the smartest students (Oakes 1990), boys (Meyer and Koehler 1990), or specific ethnic groups (Moody 1998).

Content Analysis, Tropes & Intersectionality (LG 1, LG 3)

MEDIA COLUMN

In addition to longer reviews for the Media Column, we invite you to watch for and submit short snippets of instances of women in mathematics in the media (WIMM Watch). Please submit to the Media Column Editors: Sarah J. Greenwald, Appalachian State University, greenwaldsj@appstate.edu and Alice Silverberg, University of California, Irvine, asilverb@math.uci.edu.

Project Mc²: Whose Project?

Sushmita Chatterjee and Sarah J. Greenwald, Appalachian State University

Project Mc² was released on Netflix in August 2015 with a tagline of “smart is the new cool” [5]. The show was reportedly created to encourage more girls to study STEM [2, 3, 4, 7]. The first season is approximately ninety minutes long and was broken up into three segments that follow a single story line. An additional three-minute countdown clip was released on New Year’s Eve.

The show focuses on the adventures of four girls, Adrienne Attoms, Bryden Bandweth, Camryn Coyle and McKeyla McAlister. The girls are recruited to save a prince so that he can venture into space. The first three girls each have a talent connected to their last name: chemistry, technology, and mechanical expertise. In referring to the repeating letters in their first and last names (A^2 , B^2 , C^2) “we’re like a super-cute live version of the Pythagorean theorem!” This is one example where science is feminized, and there are many others in the show. For instance, codebreaking isn’t referred to as codebreaking: “I love number games” says Bryden

Bandweth. A random number generator was useful in that scenario, so scientific terms haven’t been completely removed from the show. Other mathematical items in the show include cylinders, physical notions like the connection of angle to velocity, and numerous equations on boards. Each of these is feminized by the use of the color pink or a cutesy context. Everything is cool, fun and silly for the first three girls, and these girls are very giggly. The fourth girl, McKeyla McAlister, has a last name that is more ambiguous. This meshes with her portrayal. She is more of a generalist in terms of her talents, and also is more serious and somewhat less feminine. The show’s title *Project Mc²* is named for the repeating Mc in her first and last names.

It was heartening to watch a show meant for young girls and tweens that paid attention to the transnational reality of our lives. There were characters from different countries and cultures as well as a racial diversity to the cast. They showcased a youth style unique to the show, with a mix of patterns and colors. While they each dressed to match their own personalities, such as Adrienne Attoms’ pink glasses, there was a certain generalizable focus on high heels and makeup. In addition, shirts often had affirmational messages on them, such as “I am the sharpest pencil in the box.” We think this was an attempt at branding to tie into the character dolls one can purchase. Sadly the transnational message is somewhat diffused under the homogenizing sameness of the look. However, isn’t that also inescapable in the marketing logic of branding and promoting goods? The show’s promotion continues on websites and social media outlets [6], which highlight STEM facts, silly jokes, science experiments, contests, and of course those dolls. Which came first, we wonder, the dolls or the show?

There were irrefutable tensions in many aspects of the
continued on page 26

Tropes and Intersectionality

- Genius, Mad Scientist, Work Life Balance, Gender & Race
 - Nerds
 - Femininity and mathematics
- Exs: Denying Mathematical Talent, Beautiful Assistant



- Representations of Sexuality
- Is Mathematics a Young Man's Game?



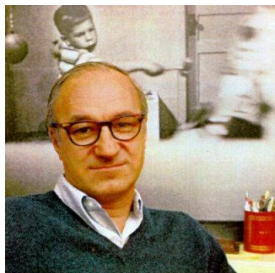
Godfrey Harold Hardy: *No mathematician should ever allow himself to forget that mathematics, more than any other art or science, is a young man's game.* [A Mathematicians Apology, 1940]

Impacts of Representations

- Gender-stereotypic commercials caused some women to underperform on a math test, avoid more math questions in favor of verbal questions on an aptitude test, and indicate less interest in quantitative career fields (Davies, Spencer, Quinn, & Gerhardstein, 2002).
- Stereotypes of scientists and mathematicians conflict with African-American cultural identity (Powell, 1990) and similar conflicts exist for Native American students (Moore, 1994).
- *Negative portrayals amuse math majors, but some did not major in math because of them.* [Latterell, 2005]

Social Cognition Theory (Albert Bandura, 1960s)

- portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and media influences
- Bobo doll experiments





**Advancing Women
and Girls in STEM
Careers Through
Mentoring**

Calls to increase the number of talented women scientists on television in order to recruit more majors.

- In other contexts television shows grounded in social learning theory have been shown to lead to lifestyle changes (Ballard, 2006)
- When recent film characters held STEM positions, 88.4% were men and 11.6% were women (Smith et al., 2014)
- Positive Impacts of Panels of Role Models (Picker & Berry, 2002)