

**WORKING GROUP ON GENDER AND SEXUALITY IN MATHEMATICS EDUCATION:
INFORMING METHODOLOGY WITH THEORY**

Katrina Piatek-Jimenez
Central Michigan University
k.p.j@cmich.edu

Brent Jackson
Michigan State University
bjackson@msu.edu

Ana Dias
Central Michigan University
dias1al@cmich.edu

Weverton Ataíde Pinheiro
Indiana University
wpinheir@iu.edu

Harryson Gonçalves
State University of São Paulo
harryson@bio.feis.unesp.br

Jennifer Hall
Monash University
jennifer.hall@monash.edu

Elizabeth Kersey
University of Northern Colorado
Elizabeth.kersey@unco.edu

Angela Hodge-Zickerman
Northern Arizona University
Angie.Hodge@nau.edu

The Gender and Sexuality in Mathematics Education Working Group convened in 2018 and 2019. Over the past two working group sessions, working group members have (1) shared historical and contemporary research related to the topics of the working group; (2) clarified language related to gender and sexuality; (3) developed understandings related to language and its influence on methods, results, and interpretations; (4) explored how gender and sexuality are experienced by students and teachers, and studied by researchers, in international contexts; and (5) developed research relationships among participants to explore relevant ideas. Based on the discussions from past working groups, during the 2020 Working Group, we will strengthen our understanding of these topics by examining underlying theories of gender and sexuality and the affordances of these theories on both research and practice.

Keywords: Gender and Sexuality; Equity and Diversity; Affect, Emotion, Beliefs, and Attitudes

The Gender and Sexuality Working Group has met during the two previous PME-NA conferences. These meetings have resulted in a shared foundational knowledge of the research area and has helped us develop understandings related to how language choices in gender and sexuality influence research methods, results, and interpretations. The goal of the 2020 working group is to expand our communal knowledge on utilizing theories of gender and sexuality within our work in mathematics education. In order to reach this goal, this year's working group is organized to provide participants with opportunities to develop deeper understandings of theories from gender and sexuality studies—with a focus on conceptions of identities.

Theoretical Background

The previous Gender and Mathematics Working Group contributed significant understandings regarding girls' and women's experiences in mathematics (See Forgasz, Becker, Lee, & Steinhorsdottir, 2010). Early research in this area focused on biological sex-based disparities in mathematics achievement (Lubienski & Ganley, 2017). Subsequently, the field shifted to study gender, via the sociocultural factors that influence girls' achievement and participation in mathematics (Leyva, 2017). In response to calls for clarity in the way that mathematics education researchers define and operationalize gender (Damarin & Erchick, 2010), theories of gender as performative (Butler, 1993) are now being employed in mathematics education research (i.e., Chronaki, 2011; Darragh, 2015; Gholson & Martin, 2019). Conceptualizing gender as performative repositions gender as an aspect of identity that is interactionally (re)produced. Researchers who investigate identity in mathematics education have also tended to draw on a variety of

epistemological traditions (Darragh, 2016; Langer-Osuna & Esmonde, 2017). While identity categories have been problematized in feminist theories, queer theory has deconstructed the concept of identity. Some researchers have proposed a gender-complex education in which the existence of queer students is reflected in curricula (Rands, 2013; Rubel, 2016). The 2020 working group will focus on bridging theories of identity and gender to more fully understand their affordances and limitations when applied to teaching and learning mathematics. We will also discuss newer methodologies for research in mathematics education from feminist and queer theories (Mendick, 2005b; Rands, 2009).

Organization and Structure of the Working Group

The organization and structure of the working group were created to maximize participation, while focusing on topics that prior participants have expressed interest in discussing further. In the working group sessions over the past two years, participants have implicitly explored notions of identity as narrative and the construction of mathematics as a masculine domain (Mendick, 2005a), and explicitly sought ways to collect stories avoiding a gender binary. By discussing the topics for the 2020 working group, participants will extend their understanding of gender, sexuality, and identities. On Day 1, summaries of feminism and queer theory will be provided. On Day 2, specific notions of identity and its relation to performativity will be discussed.

Day 1: Feminism and Queer Theory

The working group will begin with a 20-minute presentation by Ana Dias and Weverton Pinheiro about the history of feminism and queer theory. Based on their research and collaborative conversations, they will summarize the theoretical underpinnings from these two theories as well as include examples of how these ideas have been used in mathematics education research. After the presentations, Ana and Weverton will facilitate an activity (15 minutes) to review research from these traditions and lead a discussion (50 minutes) about feminism and queer theory in mathematics education research. The major focus of these activities will be based on the *Political Grammar of Feminist Theory*. In the activities, participants will explore feminist progress, loss, and return (Hemmings et al., 2011), and the perspective of queer theory. Day 1 will end with a preview of the topics and activities for Day 2.

Day 2: Identity and Performativity

The themes for Day 2 are identity and performativity. The impetus for these topics is the 2019 working group discussion in which participants began questioning whether these concepts are compatible. Brent Jackson will give a 20-minute discussion that extends the topic from Day 1 to include how the notions of identity and performativity have been used in feminism and queer theory. Brent will also address the implications of their use in mathematics education research. Brent will then facilitate an activity (15 minutes) regarding methods that employ varying constructs of identity and performativity in mathematics education research. To conclude the session, Brent will lead a discussion (50 minutes) on the topics from the two days and address how the ideas apply to working group members' current research or new research ideas that have been provoked from the past activities. Working group leaders will then elicit comments and recommendations for how to structure Day 3 to help participants achieve their own goals and work toward the goals of the working group.

Day 3: Working Group Plans

Based on the interests of participants, Day 3 will be organized as whole-group discussion, small break-out groups, or a combination. By the end of Day 3, the group as a whole will have generated a plan to continue working together toward the working group goals.

References

- Butler, J. (1993). *Bodies that matter: On the discursive limits of sex*. New York, NY: Routledge.
- Chronaki, A. (2011). “Troubling” essentialist identities: Performative mathematics and the politics of possibility. In M. Kontopodis, C. Wulf, & B. Fitchner (Eds.), *Children, development and education: Cultural, historical, anthropological perspectives* (pp. 207–226). Dordrecht, The Netherlands: Springer.
- Damarin, S., & Erchick, D. B. (2010). Toward clarifying the meanings of “gender” in mathematics education research. *Journal for Research in Mathematics Education*, 41(4), 310–323. Retrieved from <http://www.nctm.org/publications/journal-for-research-in-mathematics-education/>
- Darragh, L. (2015). Recognising ‘good at mathematics’: Using a performative lens for identity. *Mathematics Education Research Journal*, 27(1), 83–102. doi:10.1007/s13394-014-0120-0
- Darragh, L. (2016). Identity research in mathematics education. *Educational Studies in Mathematics*, 93(1), 19–33. doi:10.1007/s10649-016-9696-5
- Forgasz, H. J., Becker, J. R., Lee, K., & Steinthorsdottir, O. (Eds.). (2010). *International perspectives on gender and mathematics education*. Charlotte, NC: Information Age.
- Hemmings, C., Grewal, I., Kaplan, C., & Wiegman, R. (2011). *Why stories matter: The political grammar of feminist theory*. Durham, NC: Duke University Press.
- Gholson, M. L., & Martin, D. B. (2019). Blackgirl face: Racialized and gendered performativity in mathematical contexts. *ZDM*, 51(3), 391–404. doi:10.1007/s11858-019-01051-x
- Langer-Osuna, J. M., & Esmonde, I. (2017). Identity in research on mathematics education. In J. Cai (Ed.), *Compendium for research in mathematics education* (pp. 637–648). Reston, VA: National Council of Teachers of Mathematics.
- Leyva, L. A. (2017). Unpacking the male superiority myth and masculinization of mathematics at the intersections: A review of research on gender in mathematics education. *Journal for Research in Mathematics Education*, 48(4), 397–433. Retrieved from <https://www.nctm.org/publications/journal-for-research-in-mathematics-education/>
- Lubienski, S. T., & Ganley, C. M. (2017). Research on gender and mathematics. In J. Cai (Ed.), *Compendium for research in mathematics education* (pp. 649–666). Reston, VA: National Council of Teachers of Mathematics.
- Mendick, H. (2005a). A beautiful myth? The gendering of being/doing “good at maths.” *Gender and Education*, 17(2), 203–219. doi:10.1080/0954025042000301465
- Mendick, H. (2005b). Mathematical stories: Why do more boys than girls choose to study mathematics at AS□ level in England? *British Journal of Sociology of Education*, 26(2), 235–251. doi:10.1080/0142569042000294192
- Rands, K. (2009). Mathematical inqu[ee]ry: Beyond ‘add-queers-and-stir’ elementary mathematics education. *Sex Education*, 9(2), 181–191. doi:10.1080/14681810902829646
- Rands, K. (2013). Supporting transgender and gender-nonconforming youth through teaching mathematics for social justice. *Journal of LGBT Youth*, 10(1–2), 106–126. doi:10.1080/19361653.2012.717813
- Rubel, L. H. (2016). Speaking up and speaking out about gender in mathematics. *Mathematics Teacher*, 109(6), 434–439. Retrieved from <https://www.nctm.org/publications/mathematics-teacher/>