
BEYOND THE BOX: RETHINKING GENDER IN MATHEMATICS EDUCATION RESEARCH PROPOSAL FOR A SYMPOSIUM

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The present symposium is an attempt to rethink gender in mathematics education research beyond the box, and specifically the box of binaries. We consider the importance in contemporary neoliberal times of doing research in mathematics education with and through the perspective of gender and, equally, we advocate ways in which gender could be key towards discerning relations amongst mathematics, science and life. To that end the symposium will address specific questions and issues surrounding gender presently confronting researchers, as well as educators, and policy makers. Organized around presentations in dialogue with reactions, discussion and debate, the symposium is intended not only to enhance understanding but also to stimulate fresh thinking and to initiate ongoing critique about research on and with gender in reconfiguring the subject in mathematics education, reimagining classroom learning, or, reconsidering mathematics education research.

RETHINKING GENDER RESEARCH

'Rethinking Gender in Mathematics Education Research' represents an attempt to understand the way we might consider gender research in mathematics education in contemporary neoliberal times and, equally, the ways in which gender could be key to discern relations amongst mathematics, science and societal life. By gender we mean socially and discursively produced constructs of sexual difference with which people identify and which offer them ways of being and performing in the world (Butler, 2011). These constructs are characterised not only by a normative binary approach to describing gendered performance as male or female but also by gendered practices such as mothering, educating, and caring. It also includes non-binary gendered ways of being such as bi-gender, tri-gender, or pan-gender, gender-fluid, and a-gender (Butler, 2010). As a multi characterised construct, gender is socially and discursively produced at specific historical and political contexts. The process of gender-work

takes into account ways of thinking and acting made available and generated within the physical, social, cultural, discursive and historical practices of the communities organised around fixed identity categories.

RATIONALE FOR A FOCUS ON AND WITH GENDER

We believe that research on and with gender within mathematics education is at a crossroads. The harsh reality is that some gendered identities are continually denied a presence within mathematics education research. Patterns of gendered inequity provide a sobering counterpoint to claims of an equitable mathematical experience. Troubling and disrupting given gender performances within these contexts and conditions is more relevant than ever. Of no less importance is the need for a new 'vocabulary' for talking about how gender is being performed, embodied, acted, and materialized. "Rethinking Gender in Mathematics Education Research" takes those points seriously and engages symposium participants in highlighting and responding to key contemporary gender issues.

In the broader literature, developments in gender research endeavour to think differently about the division between females and males. In moving the status of gender towards negotiable discursive relations, contemporary researchers understand gender as emerging from social, cultural and economic contexts, processes and actions that are always relational and intersectional. Hence, gendered identity-work is constituted by many others, including teachers, the family or the wider society. The politics around financial crisis make the reading and negotiation of those constructions a complex endeavour. Importantly, other constructs of social difference such as class, race, ethnicity also become significant, as do histories of mathematical access, success, production, underachievement or exclusion.

WHAT WE PROPOSE

The symposium will be a key medium and space for interrogating taken for granted meanings of gender in mathematics education. Working from the premise that new understandings of gender are too important and complex to be ignored, presenters raise thorny questions about the generalised discourse of gender and its relationship with scientific thinking. In offering important new knowledge, they examine the concrete, material and human specificities of gendered experiences. In facilitating new meanings their analyses expose the conditions in which some people are caught up. They explore how gendered identity is lived by individual students, teachers or researchers, encompassing the struggle for self within wider meanings and investments in gendered identity-work. Their analyses might also reveal the significant part that mathematics education researchers play in the subtle politics around regulating normative constructions of themselves and others as gendered learners, educators or mediators.

The symposium presentations will highlight new territory for researchers within mathematics education and, because of this new ground, the presentations are designed to interrogate gendered work in mathematics education. By offering conceptual resources to stimulate thinking beyond the 'box' of binaries the presenters aim to develop a new sensitivity to everyday gendered practice. Relational, contextualised, and in some ways provocative, the presentations (both short and long) will provide, above all, an opportunity to explore alternative responses to how we conceptualize gender. But the presentations allow more than discovery: they are also able to highlight weak points located in practices where it might be possible to imagine a space for creative, tangible effects.

SYMPOSIUM ORGANISATION and STRUCTURE

The symposium will represent a coherent set of theoretical, narrative, empirical and practical applications of contemporary thinking in relation to gender and mathematics education. Three main objectives structure this organization. One objective is a theoretical perspective that highlights concepts useful for developing knowledge about gendered identity-work. A second objective is for an application of these theoretical understandings in a way that enables a more comprehensive research praxis in mathematics education research. A third objective is to stimulate debate amongst participants. The symposium we have planned will offer presentations that both (i) examine key concepts and (ii) apply those theoretical terms to gendered identities within specific historical, cultural, and social contexts and (iii) discuss and debate the usefulness of the concepts and their applications.

To that end, three presenters will speak on issues relevant to contemporary research on and with gender in mathematics education. To open up the exploratory potential of discussion, after each presentation, a dialogue with the presenter will be orchestrated. All contributors are deeply involved in working with new ideas in their research in mathematics education and represent a range of geographical regions and countries. Their presentations are not intended to provide analytic consensus in their attempts to understand the gendered experience within mathematics education. Rather, in seeking inspiration from a range of theorists, the presenters trace out carefully sequenced and systematic approaches, illustrating shifts in emphases from available gender research, and offering analyses of previously un-thought of and unexplained processes. Importantly, they offer ideas about gender that might assist in investigating an increasingly plural and uncertain mathematics education at a time of social crisis.

The symposium will start with an opening that introduces key issues concerning contemporary gender research in mathematics education by

the organisers, and, it will be followed by presentations which will, then, be placed in dialogue with colleagues and the audience. The presentations are as follows:

Presentation 1: Going Beyond the Binary: Next Steps for Rethinking Gender Research in Post-Secondary Mathematics Education. **Luis Leyva**, Vanderbilt University, USA

Gender research in post-secondary mathematics education has remained largely stagnant conceptually and methodologically. This paper reviews research on gender in post-secondary mathematics education organized by three cross-cutting units of analysis: retention factors across the mathematics pipeline, student perceptions of mathematics ability and performance, and narratives of mathematics experiences. Much of this research conceptualized gender as a binary trait resulting in sex-based comparisons that left variation in mathematics achievement and participation implicit. Thus, there remains room for analysing gender as socially constructed and shaped by other identities (e.g., race/ethnicity, sexuality) to further advance approaches toward gender equity in post-secondary mathematics education.

Presentation 1 in dialogue with: **David Stinson**, University of Georgia, USA

Presentation 2: Gender, intersectionality, and a critical postcolonial critique: Mathematics and STEM education. **Dalene Swanson**, University of Stirling, Scotland

Much has been said about gender in mathematics education across the last several decades, with an increase in variety of theoretical and argumentative positions from which issues have been researched. Recently, there has been more critical engagement from poststructural and social justice positions beyond questions of mere access. I argue that it may be time to include intersectionality and postcolonial theories to the mix to attend to the more complex issues of mathematics and STEM learning in the gendered contexts of crises of economic development, global conflict and displacement, and the hyper-realities of 21st century modernism.

Presentation 2 in dialogue with: **Kathy Nolan**, University of Regina, Canada

Presentation 3: Wired in the kitchen-table: In-between cyborgs and subalterns for the production of mathematics education research. Anna Chronaki, University of Thessaly, GR & University of Malmö, SE

Being 'wired in the kitchen-table' is a familiar image denoting fe/male contemporary connectivity to work cultures at neoliberal times. It signifies a chronotope where we produce work for mathematics education research as we prepare food, mother children or care for others at the same time. How do we embody this complex neoliberal gendered

subjectivity of 'homo oeconomicus', or 'knowledge economy' wo/man? What could the constructs of cyborg and subaltern, based on feminist SST studies and postcolonial critiques offer? And, what might be their effects for our work and research practices in teacher education, children's learning and curriculum?

Presentation 3 in dialogue with: Heather Mendick, freelance academic, United Kingdom

REFERENCES

- Butler, J. (2011). *Bodies that matter: On the discursive limits of sex*. New York. Routledge.
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