

Book Review...

Casting Light on the *Other*: Women in Mathematics

Dawn Leigh Anderson

Women in Mathematics: The Addition of Difference. (1997). Claudia Henrion. Bloomington, IN: Indiana University Press. xxxi + 293 pp. ISBN 0-253-21119-0 \$17.95.

In *Women in Mathematics: The Addition of Difference*, Henrion (1997) attempted to understand the culture of the mathematical community and its associated set of beliefs and norms. In particular, her intent was to identify and examine how the culture of the mathematical community influences women who choose to work in it. In order to highlight women's experiences in mathematics and to capture their perceptions of the mathematical community, Henrion selected and interviewed eleven prominent women mathematicians from various regions of the United States; nine of the narratives are included as biographical essays and interviews.

When Henrion first began this project, her main goal was to capture the life stories of women who were successful in mathematics and to use them as examples to encourage women entering the field. By highlighting the diverse life stories of nine successful women mathematicians, Henrion wanted to dispel the traditional stereotypes about women in mathematics; stereotypes that we have all heard, such as women can't or don't do mathematics and women who do mathematics are masculine and unattractive. An overarching theme of Henrion's work was the multiplicity or diversity that was evident across the women's stories, which she used to show that there is no requirement for a particular type of woman for success in mathematics. As Henrion progressed in her research, it became evident, however, that simply telling the life stories of a select few women mathematicians was not enough to address other deep-seated issues that needed attention, particularly the low number of women in mathematics beyond the undergraduate level, and the marginalization that women feel in their respective mathematical communities. Thus, Henrion turned her attention to an examination of the ways in which the social structures, activities, and belief systems of the mathematical

community seem to marginalize women. In essence, Henrion was interested in exploring both the "outsider-within" (Collins, 1991) mentality that was evidenced in the women's stories and its sources.

Henrion neatly organized the book into six chapters. Each chapter discussed and dispelled a myth about mathematicians, mathematics, and/or the mathematics community. The following are the six chapters and seven myths that Henrion examined:

Chapter 1: Rugged Individualism and the Mathematical Marlboro Man
Myth: *Mathematicians work in complete isolation.*

Chapter 2: What's a Nice Girl Like You Doing in a Place Like This?
Myth: *Women and mathematics don't mix.*

Chapter 3: Is Mathematics a Young Man's Game?
Myth: *Mathematicians do their best work in their youth.*

Chapter 4: Women and Gender Politics
Myth: *Mathematics and politics don't mix.*

Chapter 5: Double Jeopardy: Gender and Race
Myth: *Only white males do mathematics.*

Chapter 6: The Quest for Certain and Eternal Knowledge
Myths: *Mathematics is a realm of complete objectivity. Mathematics is non-human.*

After close examination of the six chapters and seven myths above, it appears that Henrion captured a wide range of myths that are prevalent in American society. Accompanying each of the first five chapters were biographical essays and interviews, which were most illuminating and inspiring. Chapter 6 did not include any biographical essays or interviews. Instead, Henrion used Chapter 6 as a forum to discuss and critique opposing views of the nature of mathematics. Because Henrion used both essays and interviews to portray the women's life stories and experiences, a reader can come to know the mathematicians in two ways. The

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interviews themselves are also interesting because you are allowed to hear the women's voices and to make your own interpretations of the data.

Henrion's book has potential appeal for diverse audiences. If interested in an examination of the myths and ideologies surrounding mathematics, one could simply read the discussion surrounding the myths and the impact they have on women. Perhaps mathematicians and mathematics educators interested in exploring and dismantling these myths might find Henrion's work useful. If one was interested in only the lives and experiences of specific women mathematicians, the biographical essays and interviews could stand alone. The audience best served by this purpose might be a mathematics teacher who wishes to encourage her or his female students in mathematics. I found it helpful and necessary to read both, however, because Henrion connected the narratives of each woman to the central myths that she was dismantling.

The title of the book, *Women in Mathematics: The Addition of Difference*, implies that Henrion used a cultural feminist theoretical framework, particularly standpoint theory. Standpoint theory revolves around acknowledging the experiences of women; not simply white women, but women from various ethnic, racial, economic, and social situations. A major principle of feminist standpoint theory is its reliance on knowledge that is created by and situated within the viewpoint of women. Women construct their own knowledge and do so differently than men (Tanesini, 1999). "Knowledge is always situated by the standpoint of the knower; from a feminist standpoint, knowledge begins with women's lives" (Damarin, 1995, p. 247). Even though Henrion does not use the exact words *feminist standpoint theory* as a guiding perspective that shaped her writing, she did explain that her book was "not about trying to create or define something called 'feminist mathematics.' It was, instead, about trying to understand women's experiences in mathematics, and how those experiences are tied to the culture and beliefs of the mathematics community" (p. xxiii). Henrion, therefore, stated her position clearly; she was not trying to answer the question, "do women do mathematics differently?" (p. xxiii). Rather, her intent was to shed light on "whether women have different experiences in math, and whether they have a different relationship to their work" (p. xxiii). Certainly, these statements reflect a stance that parallels the goals of standpoint theory.

Feminist standpoint theory can also help to "better understand both why patriarchal institutions and ideologies take such perverse and deadly forms and how both theory and practice can be redirected in more liberatory directions" (Hartsock, 1983, p. 231). In a similar vein, Henrion critiqued the dominate ideologies

surrounding the discipline of mathematics; ideologies that are couched in a dominant patriarchal view of mathematics. Henrion argued that the culture of mathematics and the mathematical community are suffused with "imagery" (p. xix). Not only is this imagery harmful to those who do not accept the mainstream discourse, but it serves as a filtering agent that keeps women and minorities out of the field. By focusing attention on these detrimental images, which serve as a form of the dominant discourse, Henrion dismantled pervasive myths that perpetually marginalize and oppress women in the field. Throughout each chapter, Henrion suggested and discussed ideas for transforming the way mathematics is traditionally viewed. In a sense, by examining the lives of nine different women mathematicians and extracting the diversity embedded in their experiences, Henrion was attempting to create a vision of mathematics that is more open, receptive, and liberatory for women: "Their stories enrich our vision not only of what it can mean to be a women, but also of what it can mean to be a mathematician" (p. 264).

I should mention that Henrion attacked the prevalent ideology in a subtle way. She never explicitly stated that the dominant view of mathematics and the mathematical community is socially constructed and maintained by white men. This would be damaging to the sales of a mainstream book and also label her as a *feminist*. Instead, Henrion stated that "identifying this ideology [beliefs, attitudes, assumptions, and expectations of the mathematical community] is a challenging task. Many of these assumptions and expectations are held at a preconscious level and are therefore often invisible both to those who benefit from them and to those who do not" (p. xix). Henrion sheds light on the views held by members of the mathematical community, but fails to radically challenge those who hold these views. Perhaps she strayed away from explicitly challenging those in power because she realized the complexities that reside in the answer to the question: How would men *benefit* if they acknowledged that they were indeed gatekeepers that prevented women from entering the community and recognized that they oppress and marginalize women in mathematics? It is also important to note that women are kept in the dark about the dominant patriarchal ideology because they are socialized to believe that boys and men are better at mathematics and other related fields such as engineering and physics.

Henrion did, however, state that the dominant ideology is not working for all members, particularly non-traditional members of the mathematical community, namely women. She posited that change is necessary if women are to remain and flourish in

mathematics. Henrion asserted that "by listening to people for whom traditional ways do not always work, we can begin to see more clearly what assumptions are embedded in those traditions" (p. xix). From a feminist standpoint perspective, this statement sugarcoats what really should be said, which is, that by virtue of women's less powerful position in mathematics, women are able

to perceive a rupture between what the world is like for them and what dominant views say about it. It is this 'line of fault' which alerts women that something is amiss. Starting from their experiences it is possible for them to expose those aspects of social reality that are invisible from other positions. (Tanesini, 1999, p. 142)

Throughout Chapters 1 and 2, Henrion discussed an issue that is close to the hearts and minds of feminists—that of how women are cast as the *Other*. Simone de Beauvoir (1997) posited that because men are considered the norm, women are seen as the Other. Beauvoir claimed that women are "defined and differentiated with reference to man and not he with reference to her; she is the incidental, the inessential as opposed to the essential. He is the Subject, he is the Absolute—she is the Other" (p. 13). This stance is reflected in statements made by Henrion and the women themselves. As Henrion began to break down the myth, in Chapter 1, that mathematicians are loners and work in complete isolation, she noted that "this image serves as a filter that influences who chooses to go into mathematics, and whom the mathematics community takes as one of its own" (p. 3). As a result of already being caste as the Other, Henrion argued that this myth makes it even more difficult for women to establish connections within the mathematical community. Furthermore, Henrion claimed that when women have difficulty establishing relationships and ties to the community, they perceive a lack in their own abilities to fit into the community, which can lead to self-doubt and, ultimately, can have a negative impact on their work. Thus, gender plays a role in making women feel like outsiders in the mathematical community, which Henrion demonstrated is built on connections and collaboration, not isolation.

In Chapter 2, Henrion worked hard, and did a fairly thorough job, at deconstructing the myth that the roles of woman and mathematician are incompatible. She did this by analyzing the dominant ideology from a public versus private sphere split, a notion that is often discussed in feminist scholarship. Mathematics is usually associated with the public sphere, or those things that relate to the intellect, which is often equated with men. On the other hand, women are traditionally associated with the home, which includes raising children and other activities that keep women close to

home. As a result of being identified with home, women are often cast into playing the part of mother or wife. Unfortunately, these roles are perceived as incongruous with being a mathematician. Henrion further elaborated on the effects that the public versus private split has on women:

Mathematics sits at the nexus of the two spheres, both of which are seen as disjoint from women: the world of the mind and the professional sphere. Women, on the other hand, are placed at the nexus of the counterparts of these spheres: the world of the body and personal sphere. The classic separations between mind and body and between the personal and professional sphere reinforce the belief that women and mathematics don't mix. (pp. 71-72)

As a result of these tensions between what is expected of women and what is expected of mathematicians, Henrion argued that women mathematicians are seen first as women then as mathematicians. This default assumption places women in the category of Other and has serious implications in the workplace. For example, the following quote by Judy Roitman, one of the mathematicians in the book, illustrates how she perceived of herself as the Other:

Many of the men are so courtly that I just can't deal with them... . They're just not treating me straight. It's a kind of deference that makes you *other*... . It's just that I'm *other*, and they cannot talk to me with the same kind of vibrancy and casualness and immediacy with which they're talking to each other. (p. 75)

Roitman's comment is a reminder of how women are marginalized within the mathematical community.

Henrion offered several suggestions for altering the perception that women and mathematics are incompatible. In particular, Henrion wove images of women and mathematics throughout the book that provide alternatives to the traditional view of mathematicians and their lives. Throughout the biographical essays, she suggested ways in which the mathematics community can be more receptive to women. For example, Henrion argued that deep-seated changes must be made in the way women are viewed in mathematics and the ways in which commitments outside of work—family and children—are handled for both men and women, if the field is to become more liberatory for women. What Henrion is calling for is an acceptance of multiplicity and a rejection of singularity, which is often limiting and repressive. Her ideas mirror those of Bateson (1989) who recognized that "productivity depends on the discovery of new forms of flexibility" (p. 235).

In Chapter 3, Henrion examined the myth that mathematicians do their best work in their youth. She

did a thorough job, presenting several statistics that cast doubt on the perception that mathematics is a young man's game. Henrion cited work by Stern who showed that there was no correlation between age and mathematical productivity. In fact, Stern showed that between the years 1970-1974, the number of papers published by those over the age of sixty surpassed those who were under the age of thirty-five. Henrion argued that this ideology of youth has a negative impact on women because their professional timelines may be different than their male counterparts. One reason that women do not follow a clear linear professional path relates to the time women may take off to have children or follow their spouses' careers. Henrion urged the mathematical community to reframe their perspective regarding women's professional timelines: "Accommodating women could mean cultivating a multiplicity of models for a mathematician's timeline, rather than seeing a mathematician as a kind of athlete who peaks in his or her twenties and then burns out over the following decades" (pp. 117-118). She challenged the community to create more "entry points into mathematics" and more "avenues for reinvigorating mathematical curiosity and productivity" (p. 118).

Henrion glossed over two extremely important areas, which were presented in Chapters 4 and 5, respectively: 1) the connection between women and gender politics, i.e., the *personal is political*; and 2) the effect that gender and race have on women mathematicians, i.e., the whole notion of *double jeopardy* for women of color. Henrion allocated approximately two pages of discussion for each of these two significant issues. Although she discussed these issues through the use of the biographical essays and interview transcripts, these vital issues warranted a much deeper discussion than Henrion apparently felt was necessary.

The main goal of Chapter 6 was to challenge underlying assumptions about the nature of mathematics. Typically, mathematics is perceived as objective, pure, universal, and transcendent. More often than not, mathematics is viewed as non-human, meaning free from values, emotions, and subjectivity. Henrion argued that most perceive mathematics as a quest for certain and eternal knowledge. Henrion dispelled these overarching and long-standing ideologies rather well. She centered her attack on dismantling the Platonist view of mathematics, which views mathematics as an unchanging body of knowledge that is waiting to be "discovered," by subscribing to a postmodern view of mathematics known as formalism. A formalist view of mathematics takes a constructivist approach to the nature of mathematics. That is, formalism sees mathematics as a

"human construction" (p. 238). Henrion explained the notion of formalism in more detail:

From a formalist perspective, mathematics becomes almost arbitrary, or at least (like language) the product of convention. There is no single, incontrovertible reality... . In such a philosophy it also becomes much harder to decide which set of rules or axioms to follow. And the criteria used to determine what constitutes important mathematics must shift; in fact, it is surprisingly difficult to define what criteria to use. (p. 239)

Henrion followed through nicely with her deconstruction of the Platonism view of mathematics by framing it in a postmodern view. One important area that she examined was why reason is more valued than intuition in mathematics. Henrion dispelled the myth that only reason is valid in doing mathematics, and asserted that intuition is equally vital in the creation of mathematics. Henrion noted that:

One reason that the mathematics community is not more active in conveying a more accurate picture of mathematics is that much power and prestige of mathematics comes from its claim to certainty and its image as an "exact science." Intuition, on the other hand, seems vague and fuzzy; it is therefore relegated to the private world of mathematics, or (in some attempts) exorcised completely. (p. 249)

Henrion mentioned that as a result of attaching traits such as rational and objective to men and identifying women as intuitive and subjective, women are often hesitant to acknowledge "the intuitive dimension of their work," (p. 261) for fear that it will not be taken seriously.

After critiquing the Platonic philosophy of mathematics, which views mathematics as certain and eternal knowledge, Henrion explored how this ideology impacts women. She claimed that this dominant ideology serves as a filter for keeping women out of mathematics and impacts the lives of women who are already in the field, particularly in who decides what mathematics is important to research. Henrion offered ideas and questions to stimulate further research. Henrion's work helped cast a new image of mathematics, one which is liberatory and emancipatory. She stressed that "more work needs to be done in order to elucidate the subtle relationship between gender, visions of mathematics, and the culture of mathematics" (p. 262).

In the conclusion, Henrion clarified her postmodern view of mathematics: "because there are many ways to impose pattern, there is not simply one mathematical reality. There are many" (p. 264). This stance provided the basis for her inclusionary vision of mathematics and the mathematics community. "For this reason, it is

important to have many different people participating in mathematics. Different individuals and different cultures bring their unique perspective" (p. 264). By focusing on the multiplicity of these women's lives and, at the same time, attempting to dismantle the dominant ideologies of mathematics, Henrion recognized the need for transforming the way mathematics is perceived, and acknowledged that "alternative visions are possible," (p. 264) which were reflected in the narratives of the mathematicians.

Nevertheless, Henrion made considerable headway in deconstructing powerful patriarchal notions of mathematics that marginalize women in the field and keep women out of the discipline. She offered thoughtful and insightful suggestions for creating a mathematical community that embraces differences. She provided alternative models for working and living in the mathematical community, which will, ultimately, benefit both men and women. I highly recommend Henrion's work as an entry into rethinking the way mathematics, mathematicians, and the mathematical community are perceived. Her work also offers a glimpse into the lives of nine women mathematicians that may inspire other girls and women to enter and remain in the field.

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