

Women Can't Do Math?

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My second year in high school (10th grade) students split into two groups, one for those of us who will pursue a degree in science in college, the other for those who will pursue a degree in liberal arts in college. There were 15 classes, but only 2 classes were for the students pursuing science degrees. Only a few students wanted to be in the science degree classes. No wonder people think girls are not good in math. But, perhaps it might be because girls themselves or the people around them underestimate their talent in math? Even though girls' math scores are lower than those of boys, would it also be because girls were not confident of their ability to do math, especially given the long-prevailing concept of matching rationality to men, and emotion to women? Women mathematicians even have a hard time dealing with this prejudice. They've been a minority in the male dominated society of math. Now Korean Society of Women Mathematicians (KWMS) hosted the 1st International Conference for [Korean] Women Mathematicians from June 21 to June 23.

One of the participants, Lynne Walling [46], the department chair of the Mathematics Department at University of Colorado, and Kyewon Koh Park (53), a professor at Aju University, met on the 22nd and shared their different, yet somewhat similar experiences. Meeting with a prominent woman alone could shatter 'a wrong hypothesis' that allured men and women for a long time.

Translating the conversation recorded in English was frustrating. Though an interpreter (who wanted to be anonymous) helped, you have no idea how lonely it made me feel to sit there and not to have the slightest idea what they were talking about. However, they were already like best friends talking in English, not caring whether or not the reporter was suffering. One would say something, then the other would agree and say, "A very good opinion." Luckily, I understood that much, so I would guess:

Park: A woman doing math as a career? I wouldn't have thought it.

Park: Why don't we talk about women's status in the math society in the U.S.?

Walling: It improved over the past few decades. Many women now are tenured professors. We now hear less about women not being good at math. I've even heard this at academic conferences in the past. Women could be good math teachers, but may not be suitable as researchers. At least now we no longer discourage a young person by saying such a thing. Still, it's a long journey. 20–30% of people who received Ph.D. degrees in

math in the states in the past 10–15 years are women. But only 3–5% of the tenured professors at the research universities are women. More and more women do math, but we can hardly find female mathematicians who keep on researching the field. Only a few speakers at academic conferences are women, and sometimes none. Women feel that they don't fit in the mathematical society and this is the hardship to continue their research. While I was working at NSF, I realized that women didn't even apply for research grants. One year, only 3 proposals out of the 100 [I handled] were submitted by women.

Park: Women's status in the math society in Korea is 15 years behind that of the U.S. It doesn't necessarily mean that we need 15 years to catch up. In the early 80's, many colleges were established in Korea and needed math professors. So they had to hire women to meet the need. Fewer women were hired afterwards. But there seemed to be some changes for the last couple of years. Big universities started hiring female faculty. It is a good sign.

Walling: [Some] men say that women don't have talent in math.

Walling: Has there been any governmental pressure?

Park: 2–3 years ago, the government made state universities hire 200 female faculty in three years. But a lot of universities didn't meet the quota.

Walling: We need at least that number of people to accomplish the desired result. How can you reach the number if it takes years to hire one female mathematician? If the person quits or fails to do her work after she's hired, you go back to the place you started. Yet, the number 200 is impressive.

Park: That covers female professors in all fields. There are only 2–3 spots for math.

Walling: I had an interesting experience when I was working at NSF. The NSF places importance on giving grants to women. That experience gave me a lot of encouragement. There used to be a program called "Visiting Professorships for Women." It ended in 1996. I luckily got one of these positions. The program provided one year's salary for a female faculty so that she could work at a renowned university. The universities didn't like it very much, but the program offered the grant as incentive. So universities accepted it. I went to UC Berkeley and taught graduate students there. Many women who participated in the program evaluate that the program gave more opportunities to research and improve women's status in their field.

Park: We, female professors, can influence a lot of students, too.

Walling: Of course, especially male students. The majority in math is men and we need their support.

Park: KNSF makes good efforts. For example, they give 5 extra points out of 100 points when a woman proposes research.

Walling: I guess they try to compensate for the prejudice that the committee might have by giving them extra points.

Park: I am not sure those extra points have helped, though. I never heard that somebody got the grant because of the extra points. But it is admirable that they try and that they acknowledge there is a prejudice against women.

Walling: When I worked as a program officer at NSF, I noticed that women's proposals are quite different from men's. Women's proposals are very humble and don't show self-confidence, as though they were not sure that their research would be successful. I would suggest that the proposals by women be proof-read. "May be done" should be changed to "will be done." Also, women need to express more enthusiasm since it has a big effect.

Park: In Korea, it was even hard to get the statistics on how many female mathematicians ever applied for research grants. When I was in the U.S., female students were as good as male students. If there were many females in the class, female students asked many questions and they were very active. They had very sharp questions and did well. But if there were many male students in the class, then male students led the questions and the female students were overwhelmed by them and didn't express their thoughts.

Walling: I agree. When I was in graduate school, I didn't understand a thing in one class. So I asked questions and the professor treated me like an idiot. I asked male students after class if they understood. They admitted that they didn't understand a thing, either. We were all in the same boat.

Walling: Can [programs for women] help?

Park: Then we need financial support to do so... The money is always the problem.

Walling: AMS did a good job on improving women's status in the field. There are rules to follow even for the people who do not agree we should give women more opportunities.

Park: There is only one female who had an important position in KMS. Ten years ago, people would say, "We don't want to hire you because you are a woman." But people no longer say that out loud. Still, it is hard. Hopefully, it will improve.

Walling: The most important role of AWM is to give opportunities to exchange information among women mathematicians. Because math was considered a subject for men for ages, there are not many such opportunities for women. In such forums, we share our knowledge and survival skills and such. Many women get settled in small colleges in small towns. That makes them more isolated. Participating in conferences helps.

Park: It is hard to focus on research in Korea... raising kids, culture...

Walling: That is why it's important to have opportunities to gather.

[Park:] There was doubt what good it would be to attend this conference. But many changed their minds after [coming to] the workshop. Just meeting wonderful women gives

them hope. We expected 80–100 participants, but it reached around 170.

Walling: Where did you study in the U.S.? What made you become a researcher?

Park: At Stanford. The first opportunity came not long after I had a baby. Someone read my paper and asked me to give a talk at his university. I hesitated. He advised me not to hesitate if it was because of fear. So I went. The second opportunity came when I was an assistant professor. A fellow professor asked me in the hallway one day if I had applied for an NSF grant. I thought I wouldn't get it if I did. The professor said that it was something I should do. And I applied and got the grant. I was surprised that they gave mine a good review. I was pleased by the support and the interest. That changed me.

Walling: I had a similar experience. I went to graduate school for fun. I didn't expect to get a Ph.D. Once I started it, I had a strong desire to finish it. Then I keep working in the field. A surprising thing was that many people believed in me. And I worked hard not to disappoint them. My advisor wanted me to be independent and was completely confident in me.

Park: The advisor's role is very important to the students. Advisors need to help students think positively.

Walling: My advisor helped me keep challenging myself for the better. I did my research with my own idea, not something my advisor told me to do. That helped me a lot. I didn't work as a researcher at first because I was afraid. My advisor was mad. After a while, I met a woman mathematician who used to be a [high school] math teacher. I saw how confident she was about her work. She became my hero. I thought I wanted to be a person like her. Seeing her be a member of the math community made me believe that I could be one, too. So I attended conferences more often.

Park: I guess we all have similar experiences.

Walling: But not many people are aware of it. That's why women feel isolated even further. Female mathematicians don't feel comfortable sharing their experiences with others. They don't realize that we all have similar experiences.

Park: We learn by sharing experiences.

Park: One third of the post-doctoral researchers in Korea are female, but not at the tenured faculty level. It seems that women disappear at a certain level.

Walling: Have more females give talks at conferences. That'll make them participate better.

Park: The Korean government has a plan to fill 20% of the university faculties with women.

Walling: It was hard to get a job in math in the 90's in the U.S. Men complained a lot

saying that women stole their jobs. How could they even say that? Math isn't only for men and it's not like a woman holds two positions. Now no one says it, though. They may think it, but wouldn't dare to say it out loud because it's not acceptable in the society. Also, women are outstanding in their work. There's not much room for men to complain about it. There is an advisement in the U.S. If the candidates have the same ability, then they should give a minority or a women more points. Some say that it is reverse-discrimination. But they should remember that women have always been discriminated against.