

# Preface to “Israeli Jewish and Arab Students’ Gendering of Mathematics”

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The pursuit of equity in educational outcomes, and gender equity in particular, was a driving force of the research reported in the article that follows. The underlying assumption was that social science can elucidate contributing social and cultural variables that, if acted upon, can change the outcome of educational endeavours. In adopting this perspective the alternative view, that educational advantage is largely inherited and therefore closed to innovative change, was rejected.

In adopting a cross cultural comparison, there was also the potential for insights on how cultures differ and their impacts assessed. Cross cultural gender differences provide evidence of claims that culture matters to the extent that, in certain situations, gender as a variable is dwarfed. The challenge presented is then how to translate these insights into educational strategies.

In Israel the relative disadvantage in educational performance of the national minority of Israeli Arabs is unquestioned and much social and educational research has been dedicated to issues that would narrow the gap between Israeli Arabs and Jews. With this rationale, from the outset our work was predicated on the need for an inter-ethnic comparison. We began by comparing Israeli Jewish and Arab ninth grade high school students’ views on the gender stereotyping of mathematics to see if the ethnic divide was evident in that field of education and, if so, what were its characteristics. Consistent with earlier work (Mittelberg and Lev-Ari 1999) on tenth grade Israeli and Arab pupils, counter intuitive findings were revealed that had not been reported in national Israeli documentation despite the continued performance gap favouring Israeli Jews over Israeli Arabs. Israeli Arab girls persisted in defying the male mathematics stereotype that is reported in the west and which was replicated among Israeli Jewish girls.

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These outcomes led to three important conclusions. First, the classroom need not be an uncritical mirror of conservative forces in the community. Second, members of a disadvantaged minority are capable of generating educational outcomes counter to their relatively inferior position among the majority in their society. Third, gender inequities in mathematics education are not inevitable even in traditional societies where gender norms exclude marriage and career options that are open to young girls in Western societies including for Jews in Israel. The findings described above are detailed in the article that follows. They also challenged the researchers to seek explanations for the somewhat surprising differences.

Interestingly, in the period between 1995 when the research began and the time of writing this preface, further supporting evidence for the trends reported in the article was provided by scholars conducting independent quantitative analyses on a large Israeli national base data (Nasser and Birenbaum 2005). In our quest for explanations for the findings reported in the article, we embarked on a similar analysis of the gendering of mathematics among Israeli Jewish and Arab pre-service teachers at a multi-ethnic Israeli teachers college (Mittelberg and Forgasz 2009). Among the findings, Arab pre-service teachers considered themselves as having higher mathematical competence than did the Jewish pre-service teachers. While both groups generally agreed that mathematics was a neutral domain, the Jews held this view more strongly than the Arabs. However, gender stereotyped beliefs with respect to particular behaviours were evident among both groups. Girls, for example, were still thought to have to work hard rather than have the natural ability to succeed in mathematics. Mathematics was considered more important for boys' than for girls' future careers, and the pre-service teachers believed that parents and teachers would think the same way. They also indicated that boys, more than girls, needed to succeed in mathematics and were expected to do well. Interestingly, the Jewish pre-service teachers held more negative views of girls' competence with computers than did the Arab pre-service teachers. With respect to computers for mathematics learning, members of the two groups held some opposing beliefs. The Arab pre-service teachers, for example, believed that boys were more likely than girls to find computers for mathematics learning to be boring, and were less likely than girls to like using computers for mathematics learning; the Jewish pre-service teachers' views were in the opposite directions.

Evidence from a small qualitative study focussing on mathematics teaching that was conducted in one grade 5 Jewish and one grade 5 Druze (Arab) classroom provided evidence to confirm arguments that the Arab community is undergoing a, perhaps belated, academic revolution that accords particular advantages to women (Mittelberg et al. 2011). The Jewish teacher's behaviours towards the male and female students in her classroom clearly reflected gender stereotyped expectations. At interview, this teacher stated that in her view males had more natural flair for mathematics than did girls. The Druze teacher, however, actively challenged gender stereotypes. The extent to which this occurred could have been construed as disadvantaging the males in her class. She was very aware of her behaviours, admitted that encouraging females to be successful in mathematics was one of her teaching goals. She saw education as the way to break out of the gendered expectations of her community.

From a broader Israeli societal perspective, there remain two intriguing questions from the studies we have conducted to date. Will Arab women successfully translate their emerging academic advantage into occupational prestige, income, and autonomy? And, can multicultural teacher education institutions support their Arab pre-service students in these endeavours, while simultaneously challenging the gendered beliefs of their Jewish pre-service teachers?

**Future Directions** A large scale survey of high school mathematics teachers in Israeli Jewish and Arab classrooms is planned for 2010; further qualitative explorations in these classrooms is also envisaged.

Methodologically, there is a confounding socio-economic factor at play that also deserves consideration. Each of the studies so far has been conducted in the North of Israel. This is the area in Israel with the major concentration of Israeli Arabs. The comparative Jewish participants in the study were also drawn for this same region. On the face of it, drawing samples from the same geographic area appears to be an appropriate research strategy. Yet, from an educational resource perspective, the samples are not the same. For the Arab participants, the communities under study were representative, while for the Jewish Israelis this was not the case. The best Jewish Israeli teachers, for example, are more likely to be found in and attracted to the major urban centres of Israel. The Arab educational system in the region also includes a strong private educational sector, as does the Jewish system, which belies the popular image of the former as a rural depressed minority educational system. The upcoming planned large scale survey of practising mathematics teachers will be designed to account more comprehensively for the wide spread national and cultural differences within and between the two ethnic groups in an attempt to determine the universality of the trends reported in the current research and to identify more clearly factors that contribute to the gender stereotyping of mathematics in Israel.

## References

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