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Equity in Science Education: Gender Is Just One Variable: Reply to Atwater

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The most useful sets of readings in my research methods class are sequences of papers–comments–rejoinders. They serve to highlight several viewpoints, not just one, and promote a good deal of discussion and reflection among students. Thus, I am pleased to find that the eighth issue of Volume 35 of this journal has resulted in at least one comment and the opportunity for rejoinders. This gives writers the opportunity to defend their position, restate it if they think they have been misinterpreted, acknowledge other positions, call upon new evidence, or introduce yet other perspectives. It is hoped that improved dialogue and better communication among writers and readers can result. Thus, I am grateful to Mary Atwater (2000) for stimulating this kind of exchange.

Atwater's comment (2000) on my article (Rennie, 1998) referred to my failure to deal adequately with social variables other than gender. The original stimulus for the article was frustration with authors' use of the word *gender* when clearly they were referring only to biological sex. Although the article grew to address wider issues, the initial focus on sex and gender remained. I called upon Unger's (1979) definitions to describe the difference between "sex" and "gender." She had argued that a distinction should be made between "sex," which is biologically determined, and "gender," which is a sociological label referring to "those non physiological components of sex that are culturally regarded as appropriate to males and females" (p. 1086). Such a definition makes the construction of gender dependent on a range of social variables, some of which I listed in my statement, "if the issue of gender is to be considered effectively in science teacher education, account must be taken of the way gender is constructed in terms of ethnicity, class, religion, race, and often other variables as well" (Rennie, 1998, p. 959). At the time, I was concerned that this reminder to the reader, part of just a single paragraph, dealt with the issue in a superficial way, but its expansion was beyond the purpose of the article. Certainly, I disappointed Atwater (2000), who "hoped that [I] would discuss the ways to infuse these ideas in traditional gender science education research" (p. 386).

I agree with Atwater that these ideas must be dealt with in gender research, but I do not believe this can be done effectively in traditional gender science education research. Much tradi-

tional gender research has divided the research sample into male and female groups and made comparisons between them on other variables of interest. Some of the research which claims to deal with other social variables—such as ethnicity, for example—simply subdivides the male and female groups into smaller groups based on both sex and ethnicity, and makes further comparisons. Perhaps these smaller groups are more homogeneous than the larger groups, but this kind of research does not take account of the multiplicities of interaction among the social variables. Neither does it deal effectively with the variation within groups, which is often much greater than the variation between them. Different approaches are needed, approaches that can take account of a greater number of social variables and untangle some of the interrelationships between them. Such research approaches are now appearing in science education journals, including *JRST,* but we can do better yet.

Of the research approaches outlined in my article (Rennie, 1998), the fourth, called the socially critical perspective by Willis (1996), has the best chance of dealing with the interactions between gender and other social variables, including ethnicity, class, language, lifestyle, and religion (see also Willis, 1998, 1999). Of course, there is no one way, or right way, of dealing with the intersection of these variables, but a socially critical approach has a good chance of capturing more of the diversity in the research situation and explaining more of the findings. This research is not easy; in fact, it is difficult from at least two perspectives. First, from a research perspective, linking gender to the sociocultural context begins to expose the complexities which arise from the multiplicity of interactions among the social variables. Once uncovered, these must be dealt with, and traditional research approaches have limited ways of coping with these complexities. Second, from the "people" perspective, this kind of research is extremely sensitive because, metaphorically speaking, the researcher can tread not only on gender toes, but cultural toes, class-related toes, and so on. We were reminded of these complexities frequently in a large study investigating the nature and consequences of gender reform in schools (Kenway, Willis, Blackmore, & Rennie, 1998). In every school, social variables other than gender were implicated. In some multicultural schools, ethnicity was the major (but never the only) variable intersecting with gender. In one small rural school, significant variables intersecting with gender were associated with the limited employment opportunities in the town, religion, Aboriginality, and the culture of sport. To try to cope with these issues the research used a feminist poststructural framework, and we acknowledged that "the stories we [told] are situated, partial and interested" (Kenway et al., 1998, p. xiv). They could not be otherwise. We found every school's story to be different, and there were different stories within schools, but what else could be expected? Although we were able to draw some threads together in our conclusions, there was no neat finish to our research; we felt we had just scratched the surface.

In the context of gender and science education, yes, gender interacts in significant ways with other social variables and we should not ignore this in our research or in the way we communicate our findings. However, we need more creative ways to explore and describe these interactions because they are not well understood. They are fluid, moving and changing in often unpredictable ways. They are multilayered, working in different ways at different levels of even one apparently defined sociocultural context, such as a single school. Disentangling them is a major research challenge. It is only a tiny step forward to recognize the gender and ethnic differences among students, characterizing "Malaysian boys," "Cambodian girls," "Muslim girls," and "Spanish boys," as did the teachers in one of Kenway et al.'s (1998) multicultural schools. We need to look far beyond a fresh round of stereotypes, while at the same time realizing that as each of us tries to understand the perspectives of people of different gender, class, language, lifestyle, and religion, we are bound to make mistakes. It is a challenge indeed.

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