and manuals, that I see in front of me on the screen, that I want to change. My forthcoming article in Leonardo Music Journal (1995a) explores this area further.

The level of individual gender is complex and affected by many other factors including ethnicity, race, class, and sexuality. Women composers faced with a gendered working environment develop a range of strategies to live with the paradoxical position of being a technically skilled woman composer. These strategies include denying difference or acting like one of the boys, acting as the exceptional woman, developing supportive contacts with women’s groups outside of the working environment, and actively working to change the environment through promoting and supporting work by women as well as by men, work which uses a range of compositional approaches that do not necessarily fit masculine or feminine stereotypes. My forthcoming article in Contact! (Fall 1995b) discusses strategies used by fourteen Canadian women composers.

To return to my concern today, I want you to read you a quote by Micheline Coulombe Saint-Marcoux, one of the first Canadian women to become involved in electroacoustic music. She said:

Society admires the presence of creative women, but does not in any way adjust its structures to admit them and permit them to live fully with the same rights as artists of the other sex.

(Micheline Coulombe Saint-Marcoux, as quoted in Lefebvre, 1991: 80. My translation.)

The field of computer music accepts that there are women composers of computer music. But to what extent does it adjust its structures to permit them to live fully and compose as they wish? In the balance of this paper, I will discuss the experiences of women in their initiation as composers through university studio courses. (For an elaboration of this discussion, referring also to concert halls, conferences and competitions, see McCartney 1995c). My consultants were more comfortable talking about university courses than concert halls or professional organizations, because they did not feel they were jeopardizing their careers by doing so.

Marcia Citron (1990: 105–6) has documented how composition classes until late in the nineteenth century were closed to women, and how this lack of access was both a result of, and a means of maintaining, the gendering of composition. Even a hundred years later, there are still very few women teachers of composition in university departments. But access to courses is no longer the primary concern.
Whose Playground, Which Games, and What Rules?: Women Composers in the Digital Playground

Andra McCartney
York University, Toronto, Canada
416/736-5186 andra@yorku.ca

ABSTRACT: This paper is based on interviews with Canadian women composers of electroacoustic music. Montreal: Claire Piché, Lucie Jasmin, Pascale Trudel, Monique Jean, Helen Hall and Kathy Kennedy; Toronto: Gayle Young, Sarah Peebles, Wende Bartley, Elma Müller, Ann Southam, and Carol Ann Weaver; Vancouver: Hildegard Westerkamp and Susan Frykberg. Both technology and music composition are stereotypically male domains. The gendering of electroacoustic music exists in the language and imagery of publication and software, in institutional processes, and in individual practices. This paper draws from feminist theory on technology and in musicology to discuss my consultants' experiences.

Feminist theory in music has developed only recently, and its application to electroacoustic music is even more recent. Accordingly, my comments in this paper will also refer to epistemologists' and feminist critics' thinking about science and technology. Sandra Harding speaks of three related but distinct levels of gendering: gender symbolism, gender structure, and individual gender.

[G]endered social life is produced through three distinct processes: it is the result of assigning dualistic gender metaphors to various perceived dichotomies that rarely have anything to do with sex differences; it is the consequence of appealing to these gender dualisms to organize social activity; of dividing necessary activities between different groups of humans; it is a form of socially constituted individual identity only imperfectly correlated with either the "reality" or the perception of sex differences. I shall be referring to these three aspects of gender as gender symbolism (or, borrowing a term from anthropology, "gender totemism"), gender structure (or the division of labor by gender), and individual gender (1986: 17-18).

My comments today will focus on the middle of these three terms, gender structures: the institutions of electroacoustic music and the division of activities within them. I wish to focus on these institutions because they are the places where the rules that frame the digital playground are maintained and potentially changed. But I would like to briefly acknowledge the other two terms, since I believe that they are equally important.

Dualistic gender metaphors pervade the electroacoustic studio. When I compose with recorded or synthesized sound on the computer, I work with technology that is already inscribed with gendered and colonial cultural values: I use a master controller keyboard and a slave module. I capture a region in a soundfile, bang a metro, strip a note, punch in a new sound, kill an unwanted track and mix down my resulting file to virgin tape. This is the symbolic level of computer music—the language used in programs.
in the 1990s electroacoustic composition classes are equally open to men and to women. However, the percentage of women students in these classes is remarkably low at many of the Ontario universities that I contacted, with an overall average of 24%. In many cases, there was only one woman in a class.

Low initial enrollment may be because women do not think of themselves as tool-users. Early socialization encourages gender conformity: girls are taught to relate, and boys to tinker (Whitehorn 1992: 179–180). This socialization takes place through the home, playground, school, and mass media. A morning spent watching children’s Saturday morning programming reveals advertisements and programming that encourage girls to see themselves as passive, warm, soft, and caring, relating to soft toys and dolls; boys, as active, cool, hard, and warlike, manipulating tools and machines ranging from cars to robots. Pascale Trudel remarks that at her secondary school, different technical standards were expected of girls and of boys: "At secondary school, we had to pass orientation tests, and the girls were not given the part about electronics, engineering, etc. It was, even by that time, discriminating.”

All of my consultants had been in a minority as students, and many perceive the environment as a difficult one for women. Wende Bartley describes the electroacoustic studio course as "a very macho environment. It’s a much more macho environment than composition." Seven composers mention having been the only woman in their electroacoustic studio course, while five women speak of having attended classes where there were one or two other women (in a total class size of ten to fifteen students). Two of my consultants learned electroacoustic composition outside of formal classes.

At two of the Ontario universities that I contacted, there was an introductory course followed by an advanced course. Although in the introductory courses 25% of the students were women, only 4% of the total students enrolled at the advanced level were.7 Pascale Trudel also mentions this phenomenon of female students dropping out after an introductory course: "All of the women who started at the same time as me dropped out after one or two years" (11). Is this drop-out rate for a reason similar to that noted by Turkle in her analysis of computer culture: discrimination that takes place "not by rules that keep people out but by ways of thinking that make them reluctant to join in" (1990: 132)? This could explain why
some women would try an electroacoustic course, but not continue. Susan Frykberg believes that this may be so:

Really there is a sense of: "Go away from here, I don't want you messing around with my technology." It's almost like it's personal, an extension of their bodies, their power structures. It may not be overt, they don't tell you to go away but the kind of teaching and the 'man talk' about technology in a sexual way, a sexual barrier. There's a sense that the technology is part of one's own privilege and if you can't do it right you're incompetent or marginalized. It's a big force. I think it's a really powerful force, in which the male psyche and the technology is intertwined. One of the things that is very interesting is this whole idea of men and their fear of the woman's fertility—it comes out of this fear of losing. It's a mystery of creation, it's very psychologically intertwined. So a woman will feel that, and even though she might not be able to articulate that is what's going on, that might be enough to stop her from going into the technology.

Entering the electroacoustic studio course, a woman student is in a minority, surrounded by language that may seem alienating. In addition, she has been socialized away from machines, and her approach to them may reflect this. Several of my consultants mention differences in approaches to the equipment between men and women students. They notice male-female differences in confidence levels, approaches to questioning, and attitudes towards the machines. Their comments are remarkably consistent: male students tend to work away at the machines without asking questions, female students either ask questions or remain silent and seem ill-at-ease with the equipment.

Social relations are not the only problem. Several of my consultants note a lack of tolerance in the electroacoustic studio for a variety of ways of working. Monique Jean describes how her intuitive, improvisational and "pleasurable" way of working was discouraged in a university environment that valued a more structured approach:

One must still take pleasure in composing. It can't just be conceptual, at least for me. At the moment, at university, it's more the trend of conceptual art which predominates: importance is placed on the elaboration of a system, on the concept of a work which one then transmits to the computer to be translated. Boring!

Monique Jean's description of being told to construct a plan, and then give it to the computer to carry out is similar to what Turkle and Papert describe as the predominant approach to computer programming used within University programming courses. These courses teach "that there is only one right way to approach the computer, a way that emphasizes control through structure and planning" (1990: 134). When the predisposition towards planning in computer programming courses, and the historical
importance of syntax in electroacoustic composition are brought together, it seems no surprise that many
courses would emphasize the approach of "conceptual set."

Turtle and Papert observe many of their students using a different approach, one which they call
"bricolage." The bricoleurs like "to play with the elements of the program, to move them around almost as
though they were material elements—the words in a sentence, the notes in a musical composition, the
elements in a collage" (1990: 136). Many, but not all, of these students are women. In the programming
courses, these students had been told that their approach was wrong. This "bricolage" method is similar to
some of the descriptions given by some of my consultants, too. Ann Southam spoke of her enjoyment of
playing and "smacking around" with sounds in the analog studio (1), and Hildegard Westerkamp's description
of her way of working: "[I] work very interactively with these sounds. I hear them, and then make
decisions" (6). In some studios, composers can work freely, in whatever way they choose. That was Ann
Southam's experience, in the early days at the University of Toronto. However, in many university
settings, my consultants report that particular ways of working are prescribed, and others—the bricoleur
approach favoured by some women, for instance—are proscribed.

Several of my consultants—Helen Hall, Wende Bartley, Susan Frykberg, and Hildegard
Westerkamp, have taught or currently teach studio courses. Their teaching emphasizes pedagogical
approaches that changes the social environment of the studio.

One of Helen Hall's techniques is to work with students individually, outside of the group
atmosphere, and away from its pressures. Then, students are able to develop skills with the equipment and
confidence in their own approaches without interference. She also speaks of another approach that is a
response to the insistence of some students that they can do everything:

So there was this competition amongst the male students: "I'll handle it—I can do it, I already
know how to do this, watch me." So I have to say: "Okay, you already know how to do it, then
someone else should do it."

This anti-sexist approach would change the gender dynamics in the classroom by shifting attention from
demonstrating technique to learning.
Susan Frykberg points out that crossing disciplines and changing terminology can free students from limiting associations, allowing them to find their own voices. For instance, when she refers to an electroacoustic work as a sound document, rather than as a musical piece, it allows people, especially those with musical training, to believe that they can produce good work. She believes that the process of recording their own sounds, and making sound documents in a multi-disciplinary approach, frees students to find their own voice, and to express matters that are important to them. In addition, Frykberg uses actively anti-assist pedagogical approaches in her teaching work. She tries to work against the gender boundaries that exist before students enter the classroom, putting an emphasis on free exploration rather than technical skill by rules, by explaining exactly what could go wrong with a piece of equipment, then encouraging students to explore the possibilities of the equipment, working in groups when they wish.

Hildegard Westerkamp uses the technique of role-modelling: asking questions herself, and demonstrating that she does not always remember every technique. This strategy, becauue because it questions the authority and omniscience of the professor role, has the result of making the teacher more approachable. Hildegard Westerkamp also encourages students to work as a team, if they prefer to. These techniques derive from her own experience of working in the studio, and her conviction that she can develop different ways of working in this environment: "If I’ve taught people anything, it was just to be humans and not to be afraid of asking questions, and not to get so spaced out in the studio that you actually damage the equipment and yourself."

Hildegard Westerkamp's teaching methods also encourage students to focus on personal associations with the music that they are creating, as well as learning how to use the equipment itself, addressing her concern about the industry's predominant focus on technique. Also, because of her desire to alter the unhealthy, body-denying environment of the studio, Westerkamp decided to incorporate sonic meditations, like those of Pauline Oliveros, into the studio courses. She says: "There was a very interesting interaction going on between the studio techniques, and the body as an instrument, and group work. Then they got interested in recording the group, or recording several people making sounds together. So it went back and forth." Although Westerkamp did not say that this pedagogical technique was specifically devised
to contest the vision of technology as masculine, the integration of mind and body does question the division between these two terms that is crucial to that gendering of technology. The effect of this work would be to show composers that they did not have to give up contact with their bodies, or their subjectivities, in order to compose.

These composers all use their own experience to devise anti-sexist classroom strategies that address many of the concerns about technology expressed by many of my consultants, which I discussed earlier. Hildegard Westerkamp's integration of sonic meditations with studio work focuses attention on the body in an environment that often denies it. She demonstrates her own humanity, her occasional forgetfulness and ability to make mistakes that define her not as a techno-wizard, but as someone approachable. She also encourages students to develop a personal investment in the work, a strategy also mentioned by Susan Frykberg, who encourages her students to find their expressive and political voices. Susan Frykberg also mentions the importance of demystifying the machine, of making it clear at the outset which actions would be harmful, then encouraging students to play with everything else. This playful approach to sound is part of what also made Ann Southam's learning experience a positive one. Susan Frykberg also charges terminology, using phrases like "sound document" rather than "music", so that students are not limited by the association of music with expertise and professionalism. Helen Hall changes classroom dynamics by putting emphasis on learning rather than technical skill, and by working with students individually to allow them release from group pressures. These pedagogical techniques have the potential of altering the gender structure of electroacoustic studio courses.

I have focused this paper on the university studio course environment, not because it is the only institutional structure that affects composers of computer music, but because it is one of the first, effectively screening who will continue, who is here now at this conference. The experiences and strategies of my consultants point to ways of expanding and diversifying the social world and compositional approaches of computer music.
1 The Canadian University Music Society lists 127 composition professors in Canada; nine (or 7%) are women. I queried professors of both composition and electroacoustic music to reach this total.

2 All of my consultants were interviewed, usually in their home or private studio, between January and November of 1993.

3 This is a small sample, so further research would be needed to ascertain whether this is part of a wider trend. However, it is consistent with findings in other electronic fields, for instance engineering. Although efforts to induce women to consider engineering as a viable option began with endeavours to increase the number of female entrants to engineering courses, more recent research has found that registration in upper-level courses, and employment levels, were still low, prompting more efforts to change the way engineering is taught and conceptualized. See Nuala Swords-Leverwood, 1995; N. Nevin, R. Gibbons, and P.W. Codling, 1988, Michel, 1988; Status of Women Canada, 1989; Wajcman, 1991, especially pages 150–153; McCartney, 1991; Whitelegg, 1992.

References:
———. "(Im)possible Identities." Contact! Fall 1995b (forthcoming).