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ABSTRACT

While acknowledging the research that suggests that women approach their education with lower levels of self-confidence than men, this paper raises fundamental questions about how self-confidence has been described and measured during the last two decades. The validity of work on women's attitudes toward academic success is shown to be undercut by sex biases in research methodology and in the whole nature of the educational enterprise. Women show less interest, historically and physically, in the maintenance of the current academic structures such as competitive grading systems, inflexible and timed examinations, and the division of courses into ever smaller units organized around a rigid system of tests and rewards. Women's increasing rate of entry into post secondary education is a contradiction that needs further exploration. Using an overview of the literature and some preliminary results of a research project applying feminist pedagogy in the classroom, the paper explores reasons for instituting a feminist critique of the ideology of self-confidence, particularly as it relates to higher education in the sciences. (Author/CK)

Self-Confidence in Women's Education: A Feminist Critique

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Abstract

While acknowledging the research which suggests that women approach their education with lower levels of self-confidence than men, this paper raises fundamental questions about how this self-confidence has been described and measured during the last two decades. The validity of much of this work on women's attitudes toward academic success is shown to be undercut by sex biases in research methodology and in the whole nature of the educational enterprise. Using an overview of the literature and some preliminary results of a research project applying feminist pedagogy in the classroom, the paper explores reasons for instituting a thoroughgoing feminist critique of the ideology of self-confidence, particularly as it relates to higher education in the sciences.

One of the important outcomes of sex-role research over the past twenty or thirty years has been the consistent finding that female pupils' school performance is equal to and often better than that of their male counterparts (Maccoby and Jacklin 1974). Gone are the bogus generalizations that women can't think, women can't do math, women can't handle abstractions. This proof of female competence has also forced educational researchers to look elsewhere for explanations for persistent differences in the educational patterns of men and women. A great deal of attention has therefore been concentrated upon the psychological attitudes of young women, and, in particular, upon their attitudes towards themselves.

As researchers have struggled both to define and to measure women's attitudes relevant to this inquiry, they have been beset with the complexities of a gendered frame of reference. Sex biases in research methodology, in social attitudes and values, and in the whole nature of the educational enterprise have rendered this area of study a treacherous one indeed. Close scrutiny of recent studies on women's self-esteem and self-confidence, in the context of our own continuing research in feminist pedagogy in the physical sciences, has led us to call for a feminist critique not only of the assumptions and contradictions involved in this research, but of the cultural imperatives that become interwoven with the data. It is the purpose of this paper, therefore, to ruminate upon the issue of

self-confidence in women's education, to examine some of the problems of both definition and measurement, and to explain why a feminist reframing of this whole area seems to us to be urgently required.

STUDIES OF WOMEN'S SELF-ESTEEM

Studies of generalized self-esteem or global sense of self-worth have produced some evidence that, in terms of attitude to self, women tend to be less positive than men. The most striking work in this area has been with respect to adolescent girls, notably in studies by Kathleen Weiler (1988), Carol Gilligan (1990), the American Association of University Women (1988), Heather-Jane Robertson (1990) and Janelle Holmes and Elaine Leslau Silverman (1992). These studies all continue to illustrate that young women view themselves more negatively than do their male counterparts. The Holmes and Silverman study, of particular value for its recentness and Canadian focus, contains the following interpretive paragraph:

> The difference between the sexes on this item ("I feel good about myself") increases with age. While there is only a difference of 5% between the sexes at age 13, the gap widens to 10% by age 16. Adolescent men's responses rise slightly with age, while they decrease slightly among young women. Self-esteem decreases over time,

> as young women gradually become more aware of their status in a society that values them less than their male peers. (12)

Maccoby and Jacklin (1974), however, after examining 30 studies, conclude that "The similarity of the two sexes in self-esteem is remarkably uniform across age levels through college age" (153). Fransella and Frost (1977) explain this uniformity in terms of sex-role traits or characteristics, concluding that:

> ...women use different criteria from men when they evaluate themselves. It could be that women tend to undervalue themselves in some ways, without this leading to a lower opinion of themselves overall. (97)

These two works remind us that global internalization of social values might in some cases produce some measure of self-satisfaction, if, for example, a woman experienced pleasure from knowing she was fulfilling her role as society had prescribed it for her. It is precisely this contradictory aspect of sex-role concept that makes the global self-esteem study such an unreliable tool for assessing attitudes toward achievement in school. But there are other, more profound problems with this concept.

We have been struck by studies such as the one undertaken by

the American Association of University Women (1988), which have found Black adolescent women to have higher self-esteem scores than young white women regardless of academic achievement. At the very least they suggest that the assumption of a direct and even causal connection between self-esteem and academic achievement, particularly in the sciences, deserves more critical scrutiny. On a more profound level, they serve to remind us that much of the literature reviewed in these pages shares in the tendency, documented by Kenway and Willis in the Australian context, "to treat the issue of girls' self-esteem in a universalistic manner" (1990, p.11).

Furthermore, the concept of self as a mirror of social stereotypes fails to account for the fact that the self can be a point of resistance against social forces, a way in which one can develop a power and uniqueness that fights back the very images which are conceptualized to be the foundation of self-esteem. Nineteenth and twentieth century feminist writing is full of portrayals of self that resonate against the social norm, as well as longings for self-actualization such as Virginia Woolf's A Room of One's Own and Adrienne Rich's Of Woman Born. Even in the 80's, feminist theorists have continued to argue the value of such a view of self, and Rosi Braidotti (1987) has commented on the irony that Lacan, Derrida, and Foucault have become engaged in dismissing the notion of the rational subject at the very moment when women have access to the discourse.

But even a post-modern deconstruction of the idea of a

unitary self posits something more than a static mirror within. Arbitrary boundaries between the self and others are critiqued, and thought processes are shown to be shaped communally rather than defining an individual in isolation. Language, too, is seen in a social context, rather than an isolated act of assertion. The shifting nature of subject and object and the many perspectives which are part of human experience are concepts which suggest a richness of self rather than a reduction of self to single, static, reflecting surface. There are elements in this deconstructivist theory that are highly congruent with feminist concepts of connectedness and relation, and these links underline some of the problematics of thinking of individual development merely in terms of socially reflected self-esteem.

Indeed, as we think through the flaws in the conceptualization of self-esteem as a reflection of social value, we are forced to confront the fact that many of these studies, shaped by concerns over the damage wrought by a gendered society, tell us little about resistance or about the way in which gender intersects with the complexities of race, class, and cultural community in women's lives.

Accordingly, it seems important to search for some more concrete and better focussed definition of the way in which women see themselves in relation to educational aspirations and attainment. A much more narrowly defined area of research is that which concerns itself with self-confidence with respect to learning, studies which measure women's attitudes to specific

areas of achievement.

USING SELF-CONFIDENCE AS A VARIABLE: OUR STARTING POINT

In our own particular research, we have been concerned with the commitment of women to pursue post-secondary education in the physical sciences and, from the outset, the improvement of women's self-confidence has been one of our objectives. Many of the most persuasive studies support the hypothesis that confidence is the central gender-related predictor of persistence in the area of mathematics and science (Association of American University Women 1990; Meece 1982; Mura 1986). Since our work has involved pedagogical intervention in physics classes, interventions designed to render physics more accessible to women, self-confidence easily became one of the crucial variables to be explored. For two years now, we have been measuring changes in students' responses to physics using a specifically adapted attitudes inventory. This inventory has revealed interesting data with respect to women's connections to physics and to the learning of physics, and the patterns which we have begun to trace are related in important ways to the trends which are apparent in the research literature. Of specific note in this regard are the results of two sub-scales in the inventory we are using: we have found that women's anxiety levels are higher than those of their male peers, and that their sense of "can do," measured by a sub-scale which we have called self-concept in

physics, is noticeably lower than that of the males.

At the same time as we administer the written survey, we have also been interviewing the students who are exposed to our specific pedagogical strategies, as well as those who find themselves in classes which we identify as our control groups. These interviews have afforded us a social and historical context within which the surveys can be read and interpreted. We have interviewed hundreds of college students in introductory physics classes. It is on the basis of these interviews that we have become convinced of the need for a feminist re-framing of the issue of self-confidence.

In response to a series of questions on confidence, a young woman returning to college, let us call her Susan, begins: "I'm pretty confident, I guess. I'm doing well ... getting good marks ... but I have to work at it." Her co-student, a young man named George replies: "I know that I can do it. I work at it. I get it." These two small fragments are paradigmatic. Both of these students rate high in self-confidence. When such students are asked to reflect upon their confidence in their abilities in physics, their responses are structured by three central terms: competence, confidence, and effort. Students who are rated high in self-confidence tend to express a belief in the virtues of hard work and they see their own hard work as ensuring success. They speak of the connection between discipline, concentration, repetition, and understanding, and they see themselves as forging this connection. Many of these students see self-confidence

itself as a kind of self-fulfilling prophesy: "If you believe that you can do it, you can."

It is certainly possible to hear a subtle difference between Susan and George. Hard work for Susan qualifies her success and diminishes our assessment of her ability ("I can do it but I have to work hard"). Researchers have explored this terrain under the general rubric of modesty in female self-reports of confidence. Heatherington et al. (1989) review the findings with respect to the lower self-confidence of women and place them within the context of their own research which documents some of the negative consequences for girls who are immodest about their scholastic achievements, particularly in the areas of science and music. From this point of view, self-confidence can only be imperfectly decoded from a gendered script: femininity demands modesty; heroes remain heroes by acting with bravado. Needless to say, we know little about the way race and class interact with the gendered roles. The school as a social system reinforces the tradition. Here, we are only a small step away from the "styles" camp, popularized in the work of Deborah Tannen (1990), where gender differences with respect to the reporting of self-confidence are subsumed under the general rubric of masculine and feminine conversational styles. Certainly we need to know more about the ways in which women use language to interpret their experiences and give meanings to their lives. Our work, however, suggests that there is more than a question of style at stake in this domain.

What we have begun to uncover is a complex set of attitudes and behaviours which raise fundamental questions about not only the meaning of self-confidence but its desirability as a developmental goal. Hypothesizing that students' attitudes to teachers might help us identify dependent and independent learners, and that this identification might be relevant to an understanding of self-confidence, we have included in our interview schedule several questions which allow students to talk about how they have felt about their teachers, how they perceive their teachers having felt about them, and what kinds of student-teacher interactions have affected these attitudes. We have found, first of all, a striking consistency among all students as to their admitted dependence upon the physics teacher. "Physics is a different language," said one male student; "the teacher is the translator." In the words of a woman student, "The teacher is really important: what he knows is what you know."

Gender differences begin to emerge, however, as students talk about their inter-personal relationships with teachers. Here is Gregory, criticizing a teacher whom he feels is impatient with student questions. "He was likely to snap 'I've already covered that' when you asked him a question. He'd answer if he thought it was a valid question, but what we thought was valid wasn't what he thought was valid." Listen now to Helen, a woman student from the same course with the same teacher, and whose achievement level is the same as Gregory's, describing her experience of the same problem: "Sometimes it was like 'Aaaaah you're asking me

this again?' It really made me feel stupid."

It is tempting to identify the male here as confident, able to explain the situation as a possible shortcoming of the teacher. It is equally tempting to see the young woman as far less confident, attributing the problem to her own shortcomings. Seen in this way, this example may be used as an illustration of much of the early research on gender and attribution. Frieze (1975) summarizes studies to date as showing that females make more external attributions for success, and more internal attributions for failure, an attributional pattern which leads to lowered self-confidence.

Because theories of attribution of and expectancy for success have been so central to the shaping of the prevailing ideas about self-confidence, a brief review of this literature is perhaps in order at this point. Basic attributional theory used in most recent forms of testing derives from the work of Weiner et al (1971) who categorize attributions in a four-fold manner, including two different sets of sub-categories. The four attributions defined by the theory are ability, effort, task difficulty and luck. Ability and task difficulty are seen as stable factors, and effort and luck as unstable factors. Ability and effort are categorized as internal, and task difficulty and luck as external.

Theorizing from these principles, Frieze (1975) concludes that individuals who view success as being due to internal, stable factors are more able to take pride in their successes and

to predict future success with greater security. As noted above, she summarizes studies to date as showing that females make more external attributions for success, and more internal attributions for failure, an attributional pattern which leads to lowered self-confidence. Whereas men take credit for their successes and count on being able to repeat them, women see success as much less within their control and therefore a less reliable source of pride and motivation.

In a later study, however, Frieze et al. (1982) in a meta-analysis of twenty-one published articles, find very little empirical evidence for the theories that women generally externalize success and internalize failure, that women are prone to self-derogation, and that women have lower expectations of success. The research findings are contradictory and unclear. In the same issue of the publication Sex Roles as the Frieze et al. article, there are two studies by McHugh et al. which highlight the importance of considering sex-role appropriateness of tasks in any examination of attribution patterns. These researchers critique the paradigm commonly used to investigate attributions, stressing the need for a much more complex approach, including the discovery of some way to capture spontaneous cognitions rather than forcing attributions through questionnaires.

A modification of methodology for attributional testing which begins to be observable in the last decade is that which encorporates sex-trait inventories as part of the assessment. Crombie (1983), using the Bem Sex-Role Inventory along with tests

in achievement level and success attributions, determines that traditionally sex-role oriented females tend to show motivation in social skills rather than in academic achievement, and attribute their academic successes more often to external, unstable factors. Non-traditionally sex-role oriented females tend to show achievement motivation and behaviour in a wider rang. of activities and are more likely to use ability attributions. Erkut (1983) measures the masculinity and femininity of both males and females and correlates these traits with attributions. Feminine women are here shown to expect low grades, claim low ability, expect hard tests and attribute failure to lack of ability. Feminine men show a similar but not identical pattern: they do not appear to internalize negative feedback, and they do not claim inability to do well. Erkut concludes that "attributions and expectancy patterns associated with femininity are neither conducive to nor compatible with academic achievement, especially among women." (229)

Vollmer (1984) studies sex-role orientation to determine what he defines as instrumental and expressive trait and task expectancies. His results describe a personality that is instrumental, predicts high grades, predicts grades more accurately, and comprises both male and female students. However, females within this profile predict lower grades than do the males. The highest expectancies come from those males who score high on both masculine and feminine (instrumental and expressive) profiles. He concludes that some combination of masculine and

feminine characteristics, co-existing in the male student, produces the highest confidence rating. Basow (1988), also controlling for trait variables in attributional patterns, shows that the highest self-ratings of ability come from androgynous personality types, the second highest from masculine, the third from feminine and the lowest from undifferentiated personalities. However, her research appears to support the theory that internal locus of control (use of internal attribution factors) is related to instrumental/active/masculine traits of personality. Her conclusion is that more research needs to be done on sex-typing as it relates to self-esteem and achievement motivation: she does not express full confidence in the idea that sex typing per se provides the answer to this question.

This research, therefore, on the relation of sex-trait variables to expectancy, attribution, and achievement, cannot be called definitive; however, in most of the studies, actual maleness and femaleness continue to operate as important determining factors. Furthermore, research on expectancy and attribution which does not control for sex-trait continues to illustrate sex difference. Lenney et al. (1983) study how women and men respond to predictions of work with same sex partners with high, medium and low competence. They conclude:

> This study provides evidence that males may perceive or structure the situation in which they must compare themselves with a competent

other in a manner that maximizes the subjective probability of self-enhancement, thereby preserving their self-confidence. In contrast, females may perceive or structure the same situation in terms of the objective probability of an unfavourable comparison, thereby jeopardizing their self-confidence." (940)

In an extensive study of high school girls and their expectancy, attributional, and achievement patterns, Licht (1987) demonstrates once again female students' externalization of success, their internalization of failure, and the complex ways in which these attitudes can be seen to motivate girls in the early years of schooling and to demotivate them as tasks become more difficult and outcomes more unpredictable.

Though results of these individual studies on self-confidence tend to be somewhat contradictory, one thing is clear: the way in which individuals view success and failure is a highly gendered matter. The actual definitions of success and failure vary considerably in relation to sex-role traits. Instrumental/masculine personalities tend to value instrumental success; expressive/feminine personalities may define success in expressive terms. The complicating factor here, however, is the social and institutional value given to those definitions of success which accompany instrumental or masculine personalities. Any expectation for expressive or feminine personalities to show strong positive evaluation of their own abilties and

achievements, totally unreinforced by the educational institution, is fanciful in the extreme, and demands a kind of stubborn individualism that is in fact at variance with the very personality type which is here at issue.

But there is an even deeper reflection of gender difference with respect to these studies. Lurking behind the gender-trait studies and the categorization of personality types is, once again, as in the self-esteem studies, an assumption about the definition of self: the definition of instrumental or masculine personality appears to be the normative, successful model. The way in which males are shown to respond to these tests of self-confidence continues to suggest that males are simply better participants in the system than are females, and the normative definition of self which is involved in and implied by their adherence to the system is unitary and exclusive. Over and over again, these studies suggest that women have more difficulty seeing themselves in these terms.

If we therefore conclude that self-confidence, as it is defined and measured in these studies, is an important determining factor in educational persistence, does this mean that, as Frieze has said (1975), women need to be redirected to interpret success in ways which boost self-confidence and encourage striving? Is this the message we must take from all this work?

QUESTIONING THE IDEOLOGY OF CONFIDENCE

As we have worked with women in the physical sciences, we have been drawn to explore these issues from a different angle, focussing upon the striking correspondance between the rhetoric of self-confidence and the ethos and ideology of scientific training. Many of the markers of high self-confidence in the research literature - that is, ascription of success to effort and ability, the manifestation of persistence and tenacity, even in the face of adversity - are the central tenets of the dominant ideology in science education, epitomized in physics as the model for the sciences.

Our understanding of the ideology has grown out of our work with physics teachers in the development of strategies to personalize and humanize the teaching of physics. As the space for affective expression has grown in these classrooms, teachers have found themselves more frequently confronted with students' concerns and we have been able to monitor their responses. When a student expresses some anxiety about her or his ability to do physics, teachers tend to encourage denial ("Don't underestimate yourself") and to offer students a vision of the sciences in general and of physics in particular, which emphasizes effort, concentration, and rigour as the keys to success - "much more important than so-called intuition" insists one of the teachers with whom we have worked.

Sally Hacker (1989) has shown how central this ethos is to the training of engineers. As she traces its origins to the military, she reminds us that military institutions have

"constructed a kind of masculinity useful for them" (60). Hacker's work is critically important in that she delineates the concrete historical process shaping this form of masculinity and carrying it into other organizational structures. Brian Easlea (1987) has traced similar connections in the area of physics.

What we want to focus on, however, is the nature of this masculinity. First of all, we want to emphasize that this is a masculinity which stands at the top of a hierarchy of masculinities. That is, in a given historical context, the tremendous attraction exercised by specific institutions has much to do with the fact that these institutions offer the possibility of entrance to membership in the elite. Secondly, it is important to underline that the prospect of entry to the elite is conflated with the experience of pleasure in the discipline of control. At the core of what Hacker calls the "masculine eroticization of engineering" lie the terms central to the research on self-confidence: effort, tenacity, perseverance, and, significantly, "the control of sensuality, the emotions, passion" (56).

It is possible, then, to see self-confidence as a construct which privileges behaviour rewarded in elitist masculinist organizations and to hear in the rhetoric of self-confidence some measure of the individual's adherence to an ideology associated with such organizations. Clearly adherence comes more easily to some than to others. But perhaps it is also a question of appeal in the sense that Hacker gives to the term as she talks about the appeal of organizations like the Green Berets to young working

class males. What is important here is the insistence upon a "fit" between organizational structure, ideological structure, and individual psychology. Hac er describes how, in the daily routine of engineering training, control is experienced physically - "inscribed on the body," as Foucault would say (p.56). She reminds us that such training is not without its pleasures, but that the seductions of technology, like those of eroticism, "reflect primarily the desires of men" (55).

In a different way, Evelyn Fox Keller (1985) has also explored the extent to which the masculine identity, forged out of separateness and maintained by the defence of rigidly controlled boundaries, has shaped and been served by the paradigm dominating western science. The point which we wish to retain and underline here is the extent to which all that we have been observing is connected to a particular psychological development. It is neither a question of choice nor of style, but deeply rooted in the way in which men become men in our society.

We need to think about the extent to which our notion of self-confidence is masculine in this sense, oriented toward a masculine system of ego defence, protective for some, but, in fact, militating against many other kinds of development. It is in terms of this kind of a defence structure that we have come to understand the behaviour of a small group of physics students, eloquently represented here by a young man we call John:

> You don't go to see the teacher because you don't want him to know your situation. If you

> let them know you don't understand something and are having trouble with all this, and they had thought before that you understood it and that you just weren't working hard enough, then when they find out you don't know it that could affect how you do.

While the efficacy of John's stance as an educational strategy is certainly debatable, the point which we wish to make here is that in taking this stance, he, in fact, assumes the posture of a confident student. He hides his problems, goes it alone, toughs it out and hopes for the best. The posture, significantly, is built on a solid bedrock of fear: the fear of exposure, a fear widely generalized among the students whom we interviewed. A young woman named Marcia explores some of this feeling:

> Oh, I could never ask questions in class. Like, if nobody else is asking it, they must already know. Anyway I don't want to interrupt ....But some teachers tell you, come to their office, and I like to do that. It's a lot easier that way to ask what I need to know.

Although we have good evidence that women are less likely than men to claim talk space for themselves in the large classroom situation (Spender, 1980 and 1982; Laforce, 1987), Marcia's feelings about exposure in class are certainly not unique to women. It is interesting, however, that for Marcia, the

teacher's office is perceived as quite a different domain. In fact, in our study women were significantly more likely than men to seek out teachers in their offices. Our data has been confirmed by anecdotal evidence from many teachers who frequently interpret the female presence in their offices in terms of women's needs for reassurance and encouragement, markers of their low self-confidence. There is, however, a different view, one which sees in this very striking gender difference with respect to student initiated-consultations evidence of a preference for a different, perhaps more connected approach to learning (Belenky et al, 1986).

The way in which women tend to respond to tests of self-confidence is perhaps a symptom of their outsider status, confirmation of the fact that they are not "one of the boys," but it can also be read, on a deeper psychological level, as a sign of their resistance to the imposition of a view of self and self-fulfillment that is neither recognizable nor comfortable for these young women, particularly in its denial of affective and expressive human traits.

Lenney (1983) has observed that "women may have an unstable or 'vulnerable,' rather than a simply low level of self-confidence" (940). Change the word "vulnerable" to "sensitive" and what emerges is a social group which registers with far greater accuracy than an "insensitive" or "invulnerable" group certain problematics in a given system of achievement. Self-confidence with respect to academic achievement is, at least in

part, sustained by the masculine system of control which is an integral part of higher education. This self-confidence requires the successful blocking out of contradictory evidence and the suppression of doubt ("Success is mine. Failure is because the test was too hard.") In our headlong rush to instill greater self-confidence in women students, we do a disservice to those very women we wish most to help, unless we insist upon the extent to which our academic structures, in general but most particularly in the sciences, have been built in the interests of such suppression: competitive grading systems, inflexible and timed exams, and the division of courses into ever smaller units organized around a rigid system of tests and rewards. Women, we would argue, have much less interest, historically and psychically, in the maintenance of these structures, and their current increasing rate of entry into post-secondary institutions is a contradiction which should capture our attention.

According to a recent report from the Conseil superieur de l'education in Quebec (1992), the distinguishing feature of colleges and universities in the 90's has been the increase in the number of women attending these institutions. At the undergraduate level, women now occupy a majority position in all areas except for the pure and applied sciences. There is every reason to believe that the statistics gathered by the Conseil are not only accurate but that they represent a demographic trend which extends into the United States and across many countries in Western Europe. Underneath the statistics, of course, lies a

history of struggle, and the rate of increase is disappointingly slow at graduate levels. But women's increased presence is undeniable.

There is reason to believe that this increased presence will meet opposition. In fact, in Quebec, the Conseil superieur has called upon educational institutions to take immediate measures to "valoriser la demarche educative aupres des jeunes garcons et des hommes" (Pare 1992, 1). This suggests to us the edge of a movement toward a 're-masculinization' of education. The current emphasis on 'excellence in education,' with all its emphasis on rigour and discipline and formation fondamental, can be understood as part of this trend. There is a grave danger that the notion of self-confidence, as it has been developed to date and without the benefit of the thorough feminist critique for which we are calling, may easily be converted into one of the central tenets of a new misogyny in education.

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