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THE BODY POLITIC IN GENDERED TECHNOSCIENCE: A DECONSTRUCTIVE INTERPRETATION

DISSEPTION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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*****

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ABSTRACT

Many studies has shown that technoscience is culturally and ideologically defined as a phallocentric field. From reviewing feminist perspectives, the previous studies have limited their arguments in sexual dualism and accuse male dominant culture to obstacle female corporeal existence in technoscience. This study attempts to focus on women's stories in the real world and reconsider their live stories as corporeal experiences in power relations, and interpret them with a deconstructive concept. Beyond dualism, this study tries to use deconstructive interpretation and seek the unstable and undecidable power relation in the body politic of technoscientific culture. Two books (Alone in a Crowd and Who Succeeds in Science) as texts are chosen for this reading project because they provide female experiences in male dominant professions and inscribe not only their working experiences but also their personal lives in relation to their professional careers.

From text reading, the female sensuous/corporeal existence in technoscience may open the possibility to challenge the traditional ideology of job segregation and create an intercorporeal dialogue to dance in a free play of non-hierarchical and non-stable system. Though the female body has been culturally defined as inferiority and incapability in technoscience, the body as a political multiplicity
of marginalized minority, inappropriate sexed otherness, and pregnancy potential, can disrupt the hierarchical system of sexual dualism and destabilize gender power relations. The female identity in technoscience is neither in a category woman nor in a man, neither present nor absent in a practice of *differance*. However, the female tactile experience in technoscience is not a production of dis-identification, but a result of concrete identity which requires her individual perceptual understanding in a poli-centric dialogical field. The female body as a politic otherwise in technoscience transforms herself beyond a binary structure by concrete and elementary tactile sensation.
Dedicated to my parents
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CHAPTER 1

INTRODUCTION

Since the Enlightenment promised to liberate human beings from fear and to establish human sovereignty, science and technology have become the significant tools for human to touch the goal. The Enlightenment as an ideological propaganda claimed to improve the human control over nature and to liberate what we think and progress what we do. It enabled technoscientific development to serve toward the so-called promise of progress. As Benjamin (1968) describes, progress, as a storm from Paradise, irresistibly propels human beings into the future even though the human face may like to turn toward the past (p. 257-58). The development of technoscience might be an irresistible force which empowers the imaginary dream of technoscientific utopia. On the other hand, technoscience was seen as a neutral (sexless, raceless, and classless) tool applied and operated by human species to progress their future lives. However, since the Frankfurt School scholars described the Enlightenment as a failed promise, science and technology were reconsidered as a powerful tool for the dominant group to enslave not only nature but also the others (Adorno and Horkheimer, 1986).
From the earliest days of the radical science movement of the 1960s, the critique of technoscience has focused attention on the ways in which existing technoscience was locked into the contemporary forms of capitalism and imperialism as systems of domination and control (Rose, 1994, p. 3). Moreover, when human bodies confronted the pollution of environment and the fear of nuclear holocaust caused by the progressive technoscience, the environmentalist initiated the green revolution to protect the nature which human beings used to attempt to control due to the promise of the Enlightenment. At the same time, many feminists incorporated environmentalists to protest against technoscience, not only because they saw the costs of technoscience as the damage of human bodies, but also because they saw technoscience as a production of patriarchal dominance since women were excluded from the technoscientific culture. The discourse of anti-technoscience in feminist scholarship also influenced by the Frankfurt School proclaimed that the development of technoscience was a social problem which substantially destroyed human bodies and hindered human liberation. For the Frankfurt School, the mechanism of technoscience makes centralization of one dominant voice possible and suppresses the different other voices. As Marcuse (1964) describes, technoscience as a tool of social control might motivate a society in which the exploitation of natural resources would take place through the exploitation of human beings; on the other hand, a technologically advanced society would create an increasingly monolithic populace with so little resistance. The second wave of
feminism, coming of age during the late sixties, inherited this sense of technological hopeless (Stabile, 1994, p. 3). Thus, the feminist discourse of anti-technoscience critiqued that technoscience was not even neutral but often oppressive and antithetical to woman liberation. From pro-technoscience to anti-technoscience, women's participation in technoscience was seldom seen as significant contribution since femininity was excluded away from technoscience knowledge which proclaimed objectivity, reason and rationality; especially, in the age of anti-technoscience, women themselves turned their backs to technoscience and put technoscience in a prohibitive terrain which has not only excluded women but also been harmed women's bodies and threatened the environment. The anti-technoscience approach endorsed by so many feminists thus proposed that a rejection of technoscience was functionally identical to a rejection of patriarchy. On the other hand, the ideology of technoscience was demystified since the myth of neutrality has served for specific interests (political force, capitalist profit, imperialist intention and patriarchal dominance) to exploit and oppress the others.

The anti-technoscience wind might not successfully blow against the storm of progress in which technoscience provides the stormy motive. It might be said that both pro-technoscience and anti-technoscience were under the shadow of technological determinism since both of them admitted that technoscience had somewhat power to well or badly transform human society or culture. However, is the society/culture actually determined or
constructed by technoscientific development, or might we say that technoscientific development is pursued and determined by the society/culture? Or, might both conspire together? Or, might there be multiple complex (e.g. political, economic) forces which determine or construct a technoscientific society/culture? The relationship between technoscience and society/culture might not be one dimension. The technoscientific storm thus never stops; it keeps blowing and blowing even in a post-industrial society or a postmodern culture. As Bell (1973) states, the major function of a post-industrial society constructed by highly developed information technoscience is to control not only system/environment/society, but also human beings. In Lyotard's (1988) analysis of the postmodern condition, the main issue of the postmodern transformation is the information technoscientific knowledge which "has become the principle force of production" and "will maintain and no doubt strengthen its preeminence" in the most highly developed computerized societies (p. 5). Since the technoscience storm is strongly blowing and blowing, some feminist scholars (Keller, 1985; Harding, 1986; Kramarae, 1987; Haraway, 1987; Rakow, 1988) reconsider the communicative relationship between technoscience and women.

Women have never been welcome in the terrain of technoscientific knowledge both at the age of the Enlightenment and at the age of anti-technoscience. Stabile (1994) considers the condition of pro-technoscience as technomania and the condition of anti-technoscience as technophobia. Attempting to solve the complex
between technomania and technophobia, some feminist theorists have thought to open the possibility of entering the technoscientific terrain and suggested that women might need to engage more productively with technoscience. They not only criticize technoscience in association with masculinity like the second wave feminists' proclaim in the age of anti-technoscience, but also encourage female bodily experience with machine, mechanism, technology, and scientific knowledge and this concept is totally opposite to anti-technoscience. Facing the stormy effect of technoscience, women are now encouraged to turn their faces toward technoscientific knowledge.

To critique the exclusion of women in technoscientific culture, many feminists strictly challenge the cultural association between masculinity and technoscience. This cultural association, as Grint and Gill (1995) point out, "operates not only as a popular assumption—from which much sexist humor about women's technical incompetence has been generated—but also as an academic 'truth.' Some analysts see it as biological in origin, other as social. . . ." (p. 3). Under this cultural assumption, technoscientific culture as an ideological apparatus employs somewhat conceptual stereotype of sexual difference. It is the reason that feminist scholars argue that technoscientific knowledge has been used to legitimate the hierarchical power of masculinity in order to control and constrain the practice of the female body. Keller (1985) points out that the concept of technoscience has been overlaid by notions of gender: specifically, masculinity is associated with technoscientific
objectivity. In Bentzon's (1987) discussion, technoscience can serve as a language of social action; thus, in a technoscientific world view, women are silenced. Both Keller (1987) and Fitzsimmons (1994) explicate that the masculinity of science has been legitimated because of the concept of power and dominance. No only is the scientific objectivity linked with autonomy and masculinity, but the goals of science is linked with power and domination. In Wajcman's (1991) description, technology has at least three different layers of meanings; it is a form of knowledge, it refers to human activities and practices, and it refers to sets of physical objects. Significantly, from a socialist view, those who control technology will substantially obtain knowledge, practices, and physical objects. Moreover, knowledge could be seen as power, practices as the way that power exercises, and physical objects as property. However, the female bodily experience is culturally excluded to learn this knowledge, exercise this power and own this property; in other words, from a feminist view, technological culture is incorporated with the monolithic culture of centred masculinity. Thus, feminist scholars claim that technoscience is never neutral but gendered.

Besides critiquing the cultural association between technoscience and masculinity, feminist scholars also claim to enter the technoscientific terrain and express the presence of androcentric bias in scientific studies. In the liberal critique, equal opportunity has been the issue of participation in technoscience. Women themselves have known that they could do non-traditional or so-called men's jobs very well and help technoscientific industry
continue developing during the war time since men had to leave their jobs for war. After the war, men came back to their job positions and women back to their traditional jobs. In other words, men are the priority for those technoscientific jobs which offer higher wages in the job market. This is not only a political issue of gender equity but also an economic issue of gender segregation in the job market. Women have learned, as Haraway (1987) points out, "that both the exclusion and the exploitation are fruits of our position in the social division of labor and not of natural incapacities" (p. 218).

On the other hand, in a feminist scientific view, it is claimed that the male bias has been found in the actual design and interpretation of experiments; for instance, some research only uses male animals to represent the species and observes and interprets the behaviors as a whole (Keller, 1987). Thus, feminist scholars attempt to "reject all forms of the ideological claims for pure objectivity rooted in the subject-object split that has legitimated our logics of domination of nature and ourselves" (Haraway, 1987, p. 232). In other words, female participation in technoscience might be a way to deconstruct the legitimated logic of domination and power from the ideological bias of masculine discourse. Women are encouraged to have the discipline of natural sciences and technological knowledge just as they need every creative form of theory and practice.

However, since women entered the technoscientific terrain, there has been a big backlash which claimed that women were doing men's jobs; again, those nontraditional jobs were assumed to belong to men. Especially, it has been criticized that feminist scholars
seemed to encourage women to imitate masculinity and resemble men. As Derrida (1978) interprets Nietzsche's critique of feminism, "in truth, those women feminists . . . are men. Feminism is nothing but the operation of a woman who aspires to be like a man. And in order to resemble the masculine dogmatic philosopher this woman lays claim—just as much claim as he—to truth, science and objectivity in all their castrated delusions of virility. Feminism too seeks to castrate. It wants a castrated woman. Gone the style" (Derrida, 1978, p. 65). It is interesting that the discourse still focuses on man, masculinity, virility, objectivity and so on, although women and feminism are the subjects in the discourse. Feminism's lack of style is denounced by Nietzsche; he claims: "Is it not in the very worst taste that woman thus sets herself up to be scientific? Enlightenment hitherto has fortunately been men's affair, men's gift—we remained therewith 'among ourselves'; and in the end, in view of all that women write about 'woman,' we may well have considerable doubt as to whether woman really desires enlightenment about herself—and can desire it" (Nietzsche, 1966, p. 183). Significantly, those terms like science, technology, objectivity, and enlightenment again seem trapped in the practices of masculinity and virility. Many female workers in technoscientific under such an androcentric oppression seem upset when they get the compliment like: "You're as good as/smart as/strong as/fast as man." As a female mechanic, Dolores expressed, "I'm not struggling to be a mechanic. . . So it's kind of embarrassing when people start giving you all these strokes for 'doing a man's job,' and 'Gee, it must be real hard for you'" (Weston,
Many feminists insist that women are women and they don't have to be like men to do a technoscientific job. The technoscientific discourse seems a polemic field that binary oppositions like men/women, masculinity/femininity, objectivity/subjectivity, and culture/nature interplay dramatically. As Haraway (1997) interprets it in a postmodern way, technoscience might exceed the distinction between nature and society, subjects and objects, and the natural and the artifactual that structured the imaginary time called modernity (p. 4). In other words, the discourse of technoscience might signify a mutation which could decentralize the dominant one of those binary oppositions.

Although it is thought that technoscience makes possible destabilize sexual identity, a certain anxiety concerning the technological is often allayed by a displacement of this anxiety onto the figure of the woman or the idea of the feminine (Doane, 1990, p. 163). Some studies still show that female students have more science/technology anxiety or less confidence in technoscience than male students. A survey also indicates that most of boys and girls in primary schools describe the image of scientists as white males (Kahle, 1989). A study on gender and computer science majors in colleges describes that although women are doing much better than men at every level of math according to the transcripts over the past five years, both female and male students believe that men surpass women in science for some reasons (Sturm and Moroh, 1995). It means that women still have some kind of inferior complex in technoscience although they might have competence to do it better
than men. Namely, there might be a subtle struggle between women's bodily experiences and what they really think in mind. In fact, there are still some feminists in an anti-technoscience position who believe that technoscience as masculine violence can destroy human communication and make central control possible just as the Frankfurt School argued. There seems to be various complex forces in the body politic of technoscience from the female perspectives.

From pro/anti-technoscience to participation to backlash to subtle struggle, women confronting technoscience face incessantly transformations which might be seen as displacement and discontinual stability from a deconstructive view. In the literature review, we see lots of theoretical feminist discourses arguing with the cultural association between masculinity and technoscience, criticizing how male dominance forms logocentrism in technoscience, and attempting to declare a gender war; however, few studies really focus on female practical technoscientific experiences from which theoretical analyses or philosophical interpretations might be done. Thus, this dissertation will focus on female technoscientific experiences so that the subject can be displaced from he/man to she/woman in a deconstructive reversal since he/man/masculinity seems to be placed in a hierarchical position from the above arguments. The deconstructive reversal, for Derrida, is to invert the hierarchy that favors dominant discourse as natural and central and to reveal how the marginal discourse, which had been seen as perverted and inappropriate, can be central. Therefore, in a deconstructive reversal, we might reveal how the other/marginal/
inappropriate/women could be seen as central in a technoscientific discourse. In fact, my general theme is not to see how technoscientific culture is ideologically practiced by a patriarchal discourse as many feminists have criticized; nor do I try to demonstrate how the master of discourse in technoscience remains male dominance or phallocentrism. My purpose here is to rethink, in a deconstructive way, body politic, struggle, power and resistance by reading the discourses of female bodily experiences in technoscience. In this study, technoscience is seen as a structure which constructs specific gender meanings in the process of signification. In order to challenge the privileged structure of signification in technoscience, deconstruction as "a preeminentely political set of maneuvres" (Grosz, 1997, p. 85) questions the impossible existence of female corporeity in the phallocentrism of technoscience. As Grosz puts it, "deconstruction provides a series of challenges and insights that may serve to make feminist theory more self-critical, more aware of necessary conceptual and political investments and the cost of these investments, and thus more effective and more incisive in its struggles than it may have been before or beyond deconstruction" (ibid., p. 75). How deconstruction as an interpretive tool can work in this study and what Derrida's notion of deconstruction is will be described in the further chapter.

The texts that I am going to analyze are *Alone in a Crowd: Women in the Trades Tell Their Stories* by Jean Reith Schroedel (1985) and *Who Succeeds in Science* by Gerhard Sonnert (1995). The former book shows the stories of twenty-five women from different
ages, educations, sexual orientations and races who are blue-collar workers and share their working and living experiences in the traditionally male dominated world of the trades. The latter interviews ten extraordinarily successful female and male scientists in academia as well as ten women and men who subsequently left science even though they finished the higher education in science. By reading them, my attempt is not to demonstrate gender bias that those interviewees might experience; but, it is to look for the possibility of a plurality of political concerns in the technoscientific discourse. As Foucault (1978) writes it, "[d]iscourse transmits and produces power; it reinforces it, but also undermines and exposes it, renders it fragile and makes it possible to thwart it" (p. 101). Though, in the technoscientific culture, power and knowledge might be joined together in discourse, discourse is neither stable nor uniform. Thus, by reading from the inside of discourse, the possible otherwise might play as multiplicity in a political body which could be disciplined and struggled by a power practice. My goal here is to rethink the body politic in technoscience by reading the discourse of female bodily experiences with a deconstructive interpretation.

In next chapter, the major arguments of feminist studies on the relationship between gender and technoscience will be reconsidered and searching the possible gap of those studies on the female body and technoscience is attempted; moreover, the theoretical literature of the body politic will be reviewed. Chapter 3 will explain how deconstruction as an interpretive tool could practically work to map the study, fill the gap and reach the goal. To seek the female
corporeal existence and subjectivity in technoscience, chapter 4 will interpret the texts with a deconstructive concept. The final chapter will try to build a theory or concept of this study, summarize the whole study, discuss the problems, and suggest the further studies.
In Raymond Williams' (1985) *Keywords*, "technology" was used from seventeenth century to describe "a systematic study of the arts or the terminology of a particular art" (p. 315). According to Williams, the root, *tekhne* in Greek, means "an art or craft." In early eighteenth century, a characteristic definition of technology is "a description of arts," especially the mechanical; in modern term, technology is seen as the practical application of scientific knowledge or a system of scientific means and methods. And the term "science," in Williams' explanation, its earliest uses were very general, often interchangeably with art, to describe a particular body of knowledge or skill. From the seventeenth century, science meant primarily methodical and theoretical demonstration, but its specialization to particular studies had not yet decisively occurred until the nineteenth century. In the contemporary, since science is related to objectivity, neutrality, fact, truth, reason, and rationality, the simplifications of the conventional divisions between science and art, and objective and subjective become more evident (Williams, 1985, p. 276-280). Thus, I use technoscience as a term which conventionally implies objective, neutral, and systematic knowledge.
skills, methods, theories, and applications of the material. In this study, technoscience as a mediational structure not only includes skillful, technical, mechanical, machinery and scientific fields but also constructs specific meanings of gender in the process of signification. Technoscience could be seen as a structure in which being-to-the-world has been genderized.

From all the feminist perspectives, technoscience seems never neutral, but gendered. Many feminist scholars argue that the content of technoscience is hostile to women, from the biological research programs that suggest gender inequality is the ultimate outcome of genetic and physiological differences to the metaphorical identification of technoscientific inquiry with male sexual conquest (Longino and Hammonds, 1990, p. 164). Most feminist thinkers point out that women are culturally or ideologically excluded in the experiential domain of technoscience since the technoscientific discourse seems arbitrarily associated with masculinity. They believe that female bodily experiences might be confined due to gender stereotype and cultural construction in technoscience. They question that rationality in technoscience is masculinity or that rationality has been defined and appropriated in a way that privileges masculinity. Thus, feminist scholars suggest that the major issue in technoscience might not be a problem of competence but a problem of power relation between gender. They see male dominance in technoscience as a patriarchal maintenance which signifies male hierarchical power over female. Therefore, in a gender political view, feminist scholars strictly criticize that technoscientific
culture might involve not only the practices of control, manipulation, hierarchy, dominance, hegemony, ideology, and power, but also the intentions of exploitation, oppression, and subordination. Another major thought in feminist perspectives is to see active and practical participation in technoscience as a way of female liberation from patriarchal culture. Female participation in technoscience includes: expanding the community of technoscientists; increasing access for women; producing a biology whose contents do not diminish, neglect, or pathologize women; producing an alternative technoscience; changing the priorities of technoscience; releasing the grip of contemporary technoscientific theories on female imaginations (Longino and Hammonds, 1990, p. 165-66).

In this chapter, I will review and discuss the major feminist arguments in technoscience with three perspectives: gender equality, social/cultural construction, and sexual difference. In addition, the key contestation and the possible gap of the arguments on the relationship between the female body and technoscience will be discussed. Moreover, I'll also reviewed the theories of the body politic to be the theoretical foundation of my study.

Feminist Perspectives in Gendered Technology

The major three perspectives—gender equality, social/cultural construction, and sexual difference—are referred from Grosz's (1994) divisions of different views of body/mind dualism in feminisms. In Grosz's analysis, egalitarian feminists assert that the body is biologically determined and fundamentally alien to cultural and intellectual achievement, but the mind can be sexually neutral.
social constructionism, the body is still biological and natural, but the
mind is social and ideological. In sexual difference, there is a refusal
or transgression of the mind/body dualism; the body is no longer
understood as a biologically given object, but crucial to
understanding women's psychical and social existence (Grosz, 1994,
p. 15-18). Since technoscience, in my view, is a field of body politic
by which the female body is constituted by multiple forces, I will
attempt to apply these three perspectives to review feminist
arguments in gendered technoscience.

**Gender Equality**

In gender equality, feminists advocate equal access to
technoscience and equal opportunity for a technoscientific job for
women under any political, economic, social, and cultural
circumstances. By reviewing some limited historical inscriptions,
some feminist scholars show that women, in fact, have competence
and confidence to work in technoscience. They emphasize that
women are not incompetent or uninterested in technoscience but
they are treated in an unequal way.

Some feminists argue that many women's contributions might
have been left out of technoscientific history even though there were
many female scientists in the early scientific development. As
Stanley (1983) describes, women were probably the primary
scientists/technologists of the species, inventing most of the early
tools, arts, crafts, and machines (p. 55). From a historical view,
Wiesner (1995) points out that although in the nineteenth and
twentieth centuries science and mathematics have become fields of
study clearly identified as masculine, in the early modern period experimental science was sometimes regarded as feminine because science was something that women could work in their own houses (p. 169). During that period, women as active scientific participants were not simply assistants but made observations and published findings on their own. However, after scientific subjects moved from private laboratories to the university studies, scientific education and the Academy were blocked to women. For example, in the seventeenth century, Maria Winkelmann was flatly rejected for a position of assistant astronomer in the Academy of Sciences in Berlin, not because she lacked astronomical talent or training but because she was a woman (Wiesner, 1995, p. 171).

Some scholars observe that the categories of gender became almost completely polarized during the Enlightenment. As Jordanova (1980) and Mack (1984) illustrate, in the age of Enlightenment, human history, the growth of scientific culture through the domination of nature, was the increasing assertion of masculine ways over irrational, backward-looking women. Even in the modern time, female participation in technoscience is still ignored by many academic and official institutions. Rose (1994) portrays nine women in ten scientific Nobel Prizes between 1903 to 1988 and shows how unequally they were treated in their experiences due to gender politics. For example, although Marie Curie was awarded the Nobel Prize in 1903 and 1911, none the less the achievement did not give her a clear place in the French scientific establishment. The French Academy refused to change its rules barring the admission of women
until 1979 (Rose, 1994, p. 141-145). Take another example, Lise Meitner as a female physicist was not allowed to enter the laboratories where the male students were working; she was only permitted to work with her collaborator Otto Hahn in the woodshop during 1910s; moreover, she was not awarded a share of the prize with her collaborator in 1944 (ibid., p.146-148). Three out of nine women that Rose describes were honored in the 1980s after they have been passed over. Therefore, from those historical documents, women showed their unquestionable competence and confidence in technoscientific field; however, since the social values turned to patriarchy within which women were prohibited to pursue higher education and constrained to participate in academic activities so that they might provide less and less contribution in the technoscientific development.

Another unequal consideration is based on economic concerns. Some feminist scholars indicate that due to the male dominance in technoscientific culture, women are culturally assumed more unskilled for the technoscientific jobs so that they would show less competitive in those job markets and gain much lower wages in the society. From a Marxist feminist view, Wajcman (1991) explicates, the gender segregation of labour within the factory presented that "the machinery was designed by men with men in mind, either by the capitalist inventor or by skilled craftsmen. Industrial technology from its origins reflects male power as well as capitalist domination" (p. 21). In Wajcman's argument, the masculine culture of technology is fundamental to the way in which the gender division of labour is
reproduced in a modern industrial society. Furthermore, the gender stereotyping of jobs is not just a reflection of women's traditional role within the family; it is also formed and reproduced by the patriarchal relations of paid work (Wajcman, 1991, p. 33). Thus, since the contemporary industrial or post-industrial society is more and more technoscience-oriented, gendered technoscience might form unequal economic base between gender. Moreover, under the circumstance of gender segregation in the job market, women don't have equal opportunity to work in technoscience.

Since technoscience could be defined as a kind of systematic knowledge, the power of knowledge might not be ignored. Discussing the power relation between gender in technoscience, some feminists also emphasize that the technoscientific discourse is shaped by masculinist cultural practice which forms an unequal power relation between men and women. As Benston (1987) points out, power is the most important message that male use of technoscience communicates. In Benston's analysis, male power over technoscience is both a product of and a re-enforcement for their power in society. In other words, female alienation from the technoscientific knowledge is oppressed under the power of male dominance. Thus, female participation in technoscience is encouraged and seen as a power which can liberate women from male dominant culture and create a more balanced gender power relation.

The above discussions on gender and technoscience seem only to focus on the problem of equality in histories, institutions, political and economic situations, power relations and so on. It might be said
that since those feminist scholars overemphasize gender equality so that their points seem toward de-genderization or gender neutrality, gender differences might be ignored in their considerations. As Grosz (1994) describes, egalitarian feminism proposes a sexually neutral mind though the body is biologically determined; thus, in order to pursue gender equality, biology might require modification and transformation (p. 15-16). The egalitarian notion seems to attempt to wipe out the gender bodily differences and ignore what women really think and experience. Namely, its emphasis on equality fails to mention that the concern of equality is based on gender differences. As Scott (1990) asserts, "if individuals or groups were identical or the same, there would be no need to ask for equality" (p. 142). Therefore, "the very meaning of equality" is differences which make women be women, female be female.

Social/cultural Construction

In social/cultural construction, most feminist thinkers believe that sex-gender system is socially and culturally constructed by a vision of male dominance. The sex-gender binary opposition is interpreted as meaning that the socially/culturally constructed rules are different for men and women, not that there is a natural difference between men and women. The binary opposition not only includes man/women, male/female and masculinity/femininity but also articulates objectivity/subjectivity, reason/passion, rationality/irrationality, public/private, culture/nature and so on. Since technoscience is ideologically and culturally associated with masculinity, women "under erasure" in technoscience is seemingly
taken for granted. Many feminist scholars argue that social/cultural construction of gender binary opposition constrains female bodily experiences in technoscience and makes technoscience as an apparatus which might ideologically reproduce and maintain male dominant culture.

Wajcman (1991) points out that technoscience is a cultural product which is historically constituted by certain sorts of knowledge and social practices as well as other forms of representation (p. 158). Many feminists analyze what kind of knowledge, social practices and representation in technoscience have been produced and challenge how those have been constructed. They assert that the cultural linkage among technoscience, objectivity, rationality and domination represents a certain practice of power since those terms are major aims of modern society from the age of the Enlightenment. This powerful linkage forms a dominant culture which might empower one over the other. However, those terms are somehow articulated with masculinity and even culturally legitimized the strong relationship between technoscience and the male gender. In the age of the Enlightenment, technoscience was developed for all human beings to control nature; nevertheless, as feminists criticize, technoscience as an activity was associated with a sexual metaphor which expressed in designating nature as a woman who could be unveiled and penetrated by masculine technoscience (Jordanova, 1980, p. 45). Men were depicted as representing active agents and females as passive objects of male agency (Wajcman, 1991, p. 6). Under this sexual metaphor,
the gendered technoscience is seemingly constructed by a patriarchal culture which rules female bodily activities. In addition, due to the cultural association between masculinity and technoscience, in Keller's (1985) analysis of the technoscientific prestige, the evaluation of masculine and feminine is found as an evident consideration in the Academy. Moreover, as Tomaselli (1993) argues, because masculinity is so thoroughly imbricated in technoscientific methods and values, technoscience, perhaps more than any other area of cultural production, has been and continues to be dominated by men.

Another discussion in the view of social/cultural construction focuses on public/private dichotomy. The traditional concept of gender demonstrates the relationship of men and women in association with public and private: men are assigned to work outside of home and active in a public sphere; on the contrary, women are culturally assigned to work indoors as housewives and are inhibited to participate in public activities. Skills such as reasoning and objectivity become associated with public life, and feeling and subjectivity with private life. As Wajcman (1991) asserts, the structure of the household labour force is accompanied by a remodeled ideology of housewifery; thus, domestic technoscience has reinforced the culturally constructed sexual division of labour between husbands and wives and locked women more firmly into their traditional roles (p. 37).

In Wajcman's (1991) analysis, women's and men's relationship to domestic technology is a compound of their relationship to
housework and their relationship to machines. Men's relationship to
technology is defined differently to women's. Cultural notions of
masculinity stress competence in the use and repair of machines.
Machines are extensions of male power and signal men's control of
the environment. Women can be users of machines, particularly
those to do with housework, but this is not seen as a competence
with technology; women's use of machines, unlike men's, is not seen
as a mark of their skill; women's identity is not enhanced by their
use of machines (Wajcman, 1991, p. 89). In addition, most of
household technology advertising signifies the traditional concept of
housewife's role; women work as indoor labours and are discouraged
to go outside in public. In other words, domestic technology might
reinforce men's power over women who are socially/culturally alien
from technoscientific knowledge and expected to be unskilled.

Household technologies are gendered because men have
designed them for women to use in a particular configuration of
social relations and social practices which maintain traditional
conventions of patriarchy. Rakow (1988) indicates that, if the design
of household technologies tells us anything about gender, it is not
about feminine biology and psychology but about men and their
conceptions of women (p. 68). Thus, technoscience as an apparatus
might ideologically reinforce the social/cultural construction of
gender.

In the case of working women, although it seems that female
workers have generally been refused access to training in
traditionally masculine areas of work, the basis for distinctions of
skill in women's and men's work might be not a simple technical matter. "Definitions of skill can have more to do with ideological and social constructions than with technical competencies which are possessed by men and not by women" (Wajcman. 1991. p. 37).

Unlike the concern of gender equality, constructionists seem not to focus on the problem of equality but interpret sex segregation in the job market as a practice of gender cultural construction. Even the job didn't involve skills, some of the high pay jobs was significantly constructed by male dominance and somehow related to masculinity as an aggressive character. For example, in 1984, the EEOC (Equal Employment Opportunity Commission) sought to establish that Sears was quality of discrimination with respect to its handling of men and women for commissioned sales. Sears administered to sales applicants a test that included such questions as. "Do you have a low-pitched voice?," "Do you swear often?," "Have you done any hunting?," and "Have you played on a football team?"(Schultz, 1992, p. 331). All the questions are related to the ideological and social construction of masculinity. However, the courts interpreted that female applicants who had similar experiences to the males would be equally interested in commission sales; otherwise, female applicants wouldn't be interested in these jobs. (ibid., p. 331) The courts seemed to agree that commissioned sales were masculine jobs so that women were inappropriate for this job because men and women were different. Surely, men and women are different; however, differences might not be natural but culturally constructed and ruled by one dominant power. The final androcentric interpretation in
Sears case seems an ideological representation of the social/cultural construction of masculine dominance and feminine subordination.

Since gender differences are not natural but socially/culturally constructed, some feminist scholars like Hacker (1992) assert that the liberation of technoscience requires the elimination or diffusion of gender. They attempt to transform the constructed conventional rules of gender and also to degender technoscience especially in association with masculinity. As Wajcman (1991) points out, technical competence is central to the dominant cultural ideal of masculinity, and its absence a key feature of stereotyped femininity; thus, "the correspondence between men and machines is this neither essential nor immutable, and therefore the potential exists for its transformation" (p. 159). In social/cultural construction, feminists still believe that the body is biologically determined as scholars in gender equality do, but they emphasize that the mind is not neutral but socially constructed. Due to the notion of social construction of subjectivity, most feminist thinkers claim that what needs to be changed are attitudes, beliefs, and values rather than the body (Grosz, 1994, p. 16-17). Thus, feminists tend to focus on cultural and ideological transformations at the level of gender and create a female liberating power in technoscience. Their project is to minimize biological differences and to provide them with different cultural meanings and values to construct a female subjectivity in the technoscientific discourse.

Sexual Difference
Feminist thinkers in sexual difference challenge the conventional notions of objectivity and rationality in technoscience, express the deficiencies of some particular technoscientific studies in androcentric biases and attempt to provide different views from female perspectives. They tend to be more suspicious of the gender dualism but to be less interested in the questions of the cultural construction of subjectivity. They emphasize that there are irreducible and fundamental differences which should not be ignored in technoscience.

As Fausto-Sterling (1989) points out, given our culture's longstanding misogyny, conventional technoscience will inevitably derogate women and femininity that might develop different valuable views in technoscience. For Fausto-sterling, "good science about women, gender, and gender-linked processes can only begin to emerge in the context of a political women's movement which undercuts old stereotypes and provides a constituency for new research" (Longino and Hammonds, 1990, p. 167). Harding (1986) also claims to make the activities of feminists in technoscience intelligible and legitimate to the administrators who have power over their projects. As Keller (1988) describes, "we have proven that we are smart enough to learn what we need to know to get much of what we want; perhaps it's time we thought more about what we want" (p. 28). In other words, female participation in technoscience seems the most important way for feminist scholars in sexual difference to liberate women from a conventional androcentric world of technoscience.
In challenging the notions of objectivity, Keller (1987) claims to escape the ideology of objectivity; as she asserts, "this is the ideology that asserts an opposition between (male) objectivity and (female) subjectivity and denies the possibility of mediation between the two. . . therefore, in expending the feminist critique to the foundations of scientific thought is to reconceptualize objectivity as a dialectical process so as to allow for the possibility of distinguishing the objective effort from the objectivist illusion" (p. 238). Moreover, some feminists also attempt to reject the power of domination as well as the subject/object dualism in technoscience. As Haraway (1987) illustrates, the natural and social sciences "will have liberating functions insofar as we build them on social relations not based on domination. A corollary of that requirement is the rejection of all forms of the ideological claims for pure objectivity rooted in the subject/object split that has legitimated our logics of domination of nature and ourselves" (p. 231-232). Thus, in order to resist the ideologically dominant or hierarchical power in the technoscientific discourse, most feminists tend to suggest alternative ways of thinking and practices in technoscience.

For example, it is unique that Haraway treats technoscientific texts as stories, using the techniques of literary analysis and narrative theory to extract their meaning. She describes technology as metaphor, "technology as a poesis, as a meaning making process, as a way of embodying meanings" . . . "a technology becomes a point of passage through which people have to move. It constrains and enables possibilities" (Jaminson, 1992, p. 10-11). In order to open up
the possibilities in technoscientific discourse, female bodily experiences might be crucial. She emphasizes that it's not whether women are going to be located in the social practices of technoscience; but, it's where. If women attempt to produce powerful images in the public world, then women should have sense to participate in technoscience.

Haraway also introduces her notion of cyborg which is seen as an alliance with machines as well as human beings. As Haraway illuminates, "a cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction . . . The cyborg is a matter of fiction and lived experience that changes what counts as women's experience in the late twentieth century" (Haraway, 1991, p. 149). Thus, she suggests women as cyborgs which might create possible otherwise concepts, beliefs and values beyond gender binary opposition in technoscience. She continues, "we are cyborgs. The cyborg is our ontology; it gives us our politics. The cyborg is a condensed image of both imagination and material reality. the two joined centres structuring any possibility of historical transformation." (ibid., p. 150) The cyborg is an ironical metaphor which attempts to break the binary opposition of human beings/machines, public/private, and nature/culture. It seems a resistant power which might escape from patriarchal hegemony in technoscience. As Haraway (1991) explores.

The cyborg is resolutely committed to partiality, irony, intimacy, and perversity. It is oppositional, utopian, and completely without innocence. No longer structured by the
polarity of public and private, the cyborg defines a technological polis based partly on a revolution of social relations in the *oikos*, the household. Nature and culture are reworked; the one can no longer be the resource for appropriation or incorporation by the other. . . . The main trouble with cyborgs, of course, is that they are the illegitimate offspring of militarism and patriarchal capitalism, not to mention state socialism. But illegitimate offspring are often exceedingly unfaithful to their origins. Their fathers, after all, are inessential. (p. 151)

Damarin (1994) also points out that "the cyborg is not in any necessary way a robot, a mechanical pseudo-man which follows the directions of a pre-inscribed program with faithfulness to its father. Instead, the cyborg seeks sites for resistance to the naturalization of machines and the mechanization of culture" (p. 57). In other words, feminists in cyborg discourses assert a resistant power by bodily participation in technoscientific practices. "Our bodies, ourselves: bodies are maps of power and identity. The machine is not an it to be animated, worshipped, and dominated. The machine is us, our processes, an aspect of our embodiment. We can be responsible for machines; they do not dominate or threaten us. We are responsible for boundaries; we are they" (Haraway, 1991, p. 180).

In sexual difference, feminist scholars no longer see body/mind as binary opposition; instead, they retheorizes the relation between body and mind, especially seeing the body as constitution of systems of meaning, signification, and representation. "On one hand it is a
signifying and signified body; on the other, it is an object of systems of social coercion, legal inscription, and sexual and economic exchange” (Grosz, 1994, p. 18). Thus, they strongly suggest various possibilities of female bodily participation in technoscience as a way to demystify the ideology of masculine signification in the technoscientific discourse.

The Major Contestation

From the above reviews, the major areas of contestation in those arguments may present dualisms in the technoscientific discourse, cultural inscription of gender, hierarchy and power relation in cultural dualisms, and resistance implications in feminist discourses. The binary oppositions like masculinity/femininity and objectivity/subjectivity seem significant dichotomies in technoscience. Those dualisms might express not only two different sides of meaning but also somewhat practice of power relation. Namely, technoscience as an ideological mechanism seemingly reinforces certain cultural representation and might maintain one side of hierarchical position, especially in sex-gender system. Thus, most feminists suggest female bodily participation to liberate women from technoscientific exclusion.

1. dualisms in the technoscientific discourse

There are significant dualisms within the technoscientific discourse. Culture vs. nature, masculinity vs. femininity, mind vs. body, reason vs. emotion, objectivity vs. subjectivity, the public realm vs. the private realm - in each dichotomy the former terms seem dominant to the latter and the latter ones in each binary
opposition are somehow culturally associated with the feminine. The binary oppositions might divide two side terms into two different poles; namely, there is an oppositional meaning within the two terms. The in-between possible meanings seem not to exist so that the practice of dualisms can be operated. Since technoscience is culturally and ideologically associated with masculinity, rationality, and objectivity—manly characteristics, femininity and subjectivity are excluded by the practices of cultural dualisms. Therefore, women are seen as subordinated beings in the androcentric technoscientific discourse.

2. cultural inscription of gender

Masculinity in the technoscientific discourse is socially and ideologically constructed from the stereotype of gender system. The cultural association between masculinity and technoscience is not natural. In other words, technoscientific history constructs a myth which subordinates femininity and excludes women. Technoscience as an apparatus produces a mythic system which represents gender signification and reinforces gender dualism to maintain the power relation of male dominance. Although gender is indeed different, differences might not be natural but constructed by certain power practice in which one is over the other. Thus, in the cultural practice of dualism, gendered technoscience ideologically reinforces the superiority of one gender and the inferiority of the other.

3. hierarchy and power relation in cultural dualisms

It is significant that those dualisms are not in an equal but a hierarchical relation. One term is ideologically positioned on a
dominant place and over the other term by power practice. Namely, dualisms are culturally constructed by a hierarchical mechanism. In the technoscientific discourse, femininity is ideologically referred to inferiority and inappropriation; on the contrary, masculinity is described as rationality, objectivity, and reason. Therefore, many feminist scholars suggest various ways out of cultural dualisms to liberate from male dominance. As Haraway (1991) attempts to express a metaphor, cyborg imagery can be seen as "a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves" (p. 181). In the cyborg discourse, a possible resistant space might have been open within a power relation which is everywhere and constituted by multiple forces. Thus, feminists are seeking the possible bottom-up power in androcentric technoscience.

4. resistance implications in feminist discourses

Resistance is implied in those feminist critiques of masculinity and objectivity in the technoscientific discourse. Active participation is suggested as a way out of the mythic inscription of female incompetence and inferiority in technoscience. However, by participation, feminists do not mean to transform femininity to fit in masculine practices which is what some critical thinkers claim that feminists just want to be like men; by contrast, participation is seen as a way to create and contribute feminine possibilities in the technoscientific discourse. Technoscience is a knowledgeable field that each gender being can participate in. It won't threaten women in any way but strengthen women in a power relation. What
threatens women is the ideological apparatus of masculine politics which makes the female body fail to confront technoscience. Thus, technoscience might be seen as a body politic which reproduces and represents signification in a sex-gender system. Female participation would open up alternative possibilities in the conventionally masculine and objective technoscience.

The Possible Gap

Dualisms as a central matter in the above discussions seem cultural and ideological mechanisms which employ the practice of power in technoscience. In gender equality, men and women don't have equal opportunities in the technoscientific job market; in social/cultural construction, masculinity and femininity are constructed in a hierarchical power relation. Technoscience is signified as masculinity, objectivity, and rationality; by contrast, femininity, subjectivity, and irrationality seem inferior in the technoscientific discourse. The problematic of binary oppositions makes scholars focus on two sides of arguments but fail to consider the possibilities of in-between.

In dualism, meaning is generated by opposition. This is a tenet of Saussurian linguistics, which holds that signs or words mean what they do only in opposition to others—their most precise characteristic is in being what the others are not. The binary opposition is the most extreme form of significant difference possible. In a binary system, there are only two signs or words. Such binaries are a feature of culture not nature: they are products of signifying systems, and function to structure our perceptions of the natural and
social world into order and meaning. Moreover, these binary oppositions actively suppress the in-between ambiguities between the opposed categories. The in-between ambiguities, according to binary logic, are impossible. "It is literally a scandalous category that ought not to exist. In anthropological terms, the ambiguous boundary between two recognized categories is where taboo can be expected. That is, any activity or state that does not fit the binary opposition will be subjected to repression" (O'Sullivan et. al., 1994, p. 31). Thus, critiques only focusing on the binary opposition in technoscience will neglect the possible in-between which might be the alternative approach to technoscientific studies. The taboo of in-between has to be demystified.

For example, in the dualism of masculinity and femininity, Birke (1991) describes that the notion that masculinity or femininity represent properties of particular individuals, women and men, is in part a product of the nineteenth century; prior to that, beliefs about gender may have been less rigidly dichotomous, and more subject to change (p. 247). As Jordanova (1980) argues, writers of the eighteenth century were more inclined to believe that everyone had some elements of both masculinity and femininity; these elements were in constant struggle, but were not necessarily the property of any one individual. The in-between possibilities might provide different ways of thinking beyond the limitation of binary oppositions.

In order to think beyond binary gender system, Haraway (1988) claims that feminist theory alternatively "uses a
reconstructed version of woman to insist on the dispersion of the category, the irreducibility of the differences among women to any single category woman. Woman is plural here" (p. 94). Indeed, plurality or multiplicity are one of my concerns to rethink the relation between gender and technoscience.

Another concern is the concept of the body. In the above review, the body was seen as biologically determined and separated with the mind which was assumed to be neutral in the discussion of gender equality, or was regarded as social, cultural, and historical object, a product of ideology in the notion of social construction. However, the mind/body dualism again suppresses the in-between interactions because mind and body are two opposed categories in which one is in opposition to the other in the practice of dualism. The body actually is not only sexually determined but also constitutive of multiple forces which might come from various social, cultural, and historical power relations. As Grosz (1994) points out, "only when the relation between mind and body is adequately retheorized can we understand the contributions of the body to the production of knowledge systems, regimes of representations, cultural production, and socioeconomic exchange" (p. 19). Feminist scholars in sexual difference question the mind/body dualism and try to redefine the body as constitution of systems of meaning, signification, and representation. The sexual body is irreducibly interlocked with racial, cultural, and class particularities. Thus, my interest is to focus on female workers who have already had bodily experiences in non-traditional job positions and to rethink how the
female bodies in technoscience are constitutive of multiple forces and how sexual difference might open up the in-between possibilities beyond the masculinity/femininity dualism.

The Body Politic

From the biologically determined object to the constitution of systems of meaning, signification, and representation, the notion of the body has been transformed beyond the mind/body dualism. The body is a multiplicity. The body is a struggling field in which the multiple unstable forces like discipline, knowledge and resistance are practicing. Thus, the body becomes political in a struggle of plural power relations which form the body politic. In gendered technoscience, the body should not be discussed only in the limited dualism of masculinity and femininity, but also in the plural forces of possible otherwise. Therefore, it might be significant to rethink how the body politic of unstable multiplicity is formed and how the female body is constituted in this technoscientific body politic.

In the Cartesian tradition, mind and body were separated as a binary opposition. In his concept of "I think, therefore I am," Descartes claimed that the mind as the center of being controlled the biological body. "I think" as the mind became the most important meaning of being; on the contrary, the body was seen as a machine which acted and worked under the control of the mind. In other words, in Cartesian mind/body dualism, the mind was placed on a position of hierarchical superiority over and above the body. However, in contemporary studies, Descartes' idea has been criticized that it ignored the interaction between mind and body and the
mind/body dualism has to be challenged from an ontological and epistemological perspective. In fact, the body is reconsidered as a communicative body which might be intimately related to consciousness which is always consciousness of something. Moreover, consciousness of something should depend on the perceiving body. The mind would not understand anything without the perception and observation of the body. Further, from a phenomenological view, I will discuss how a communicative body can be political and critical. The body theories like Merleau-Ponty's phenomenal body, Pilotta's sensuous body, O'Neill's communicative body, Nietzsche's political body, and Foucault's body politic will be further reviewed.

The Mind/Bodv Dualism

As Descartes claimed that "I think, therefore I am," his philosophy of the thinking self attempted to provide a distinction of mind and body. For Descartes, the body is a self-moving machine: the mind, on the contrary, is the thinking substance or consciousness. However, this mind/body separation leaves the interaction between mind and body unexplained.

Grosz (1994) indicates at least three lines of investigation of the body as the heirs of Cartesianism: first, "the body is primarily regarded as an object for the natural sciences, particularly for the life sciences, biology and medicine; and conversely, the body is amenable to the humanities and social sciences, particularly psychology, philosophy, and ethnography..." Second, the body is regarded "in terms of metaphors that construe it as an instrument, a tool, or a
machine at the disposal of consciousness, a vessel occupied by an animating, willful subjectivity. . . " Third, the body is "commonly considered a signifying medium, a vehicle of expression, a mode of rendering public and communicable what is essentially private. . . " (p. 8-9). In the dualism, the body seems passive as an object to serve something for the mind or consciousness. However, it is quiet questionable that the body acts as a thing. Scholars in phenomenology have strong critiques of it. Their arguments will be reviewed in the further discussion.

Since Descartes divided all of reality into two substances—thinking substance (mind, or consciousness) and extended substance (bodies), many thinkers in modern philosophy question how these two substances can have an epistemological relationship. Stewart and Mickunas (1974) argue that "Cartesian dualism was a shift in emphasis away from conscious experience to objective realities as they are in themselves, with the result that consciousness was virtually ignored as a significant area of investigation in its own right" (p. 4). The Cartesian dualism ignores that "consciousness is always consciousness of something;" there must be "an indissoluble unity between the conscious mind and that of which it is conscious" (ibid., p. 9). In other words, this indissoluble unity is a unity that perceives conscious experience of objective realities; i.e., perceiving something with consciousness. As Grosz (1994) describes.

The major problem facing dualism and all those positions aimed at overcoming dualism has been to explain the interactions of these two apparently incomposable substances.
given that, within experience and everyday life, there seems to be a manifest connection between the two in willful behavior and responsive psychical reactions. (p.6)

Thus, in the mind/body dualism, to reduce either the mind to the body or the body to the mind seem to leave their in-between interaction impossible. Indeed, reductionism might be the problematic of Cartesian dualism. As Grosz asserts, "reductionism denies any interaction between mind and body, for it focuses on the actions of either one of the binary terms at the expense of the other" (ibid., p. 7). Furthermore, the meaning of domination and subordination in the binary opposition of mind and body should be deconstructed. The body is no longer understood as an ahistorical, biologically given, and acultural object, but a cultural interweaving and production of systems of signification.

The Phenomenal Body

From a phenomenological view, the body is not a thing which can move away from us. The phenomenal body is a communicative body which results in a process of signification. In other words, "corporeity is the basic communicative power." As Pilotta and Mickunas (1990) put it,

Phenomenological understanding of body, or corporeity, comprises a commitment to a situation, to a concrete world of action, an anchorage in a milieu, an immersion in an environment in which language, gesture, and bodily movements assume concrete meaning. Corporeity, as Merleau-Ponty's work has shown, is a "being-toward-the-world": it is a
preobjective and presubjective experience that can be designated as "practognosis" where the world is experienced as a field of action. (p. 74)

The body is our access to space and fundamental conception of being-to-the-world. Bodily experiences involve concrete meanings from which we are aware of being-to-the-world. We are conscious of being-to-the-world because we are conscious of something. Something should be something around our bodies. The body is access to something so that we can be conscious of something.

From a phenomenological view, consciousness is embodied consciousness, i.e., "consciousness incarnate." For phenomenologists, "it is incorrect to view the body as a thing among things and to attempt to understand it apart from its intentional structure" (Stewart and Mickunas, 1974, p. 66). Thus, there is an intimate connection between consciousness and the body.

The body must be understood in terms of intentionality just as consciousness is. The body provides the situational context for conscious experience and is the source of perspectives one has of the world. It is both the origin and organ of action in the world. (Stewart and Mickunas, 1974, p. 66)

In other words, the body is sensuous of experiencing the world. It is not an object subordinated and controlled by the mind. As Merleau-Ponty asserts, the body is the condition and context through which we are able to have a relation to objects. The body is both immanent and transcendent (Grosz, 1994, p. 86).
Merleau-Ponty begins with a corporeal phenomenological view and points out that "the perceiving mind is an incarnated body." For him, the body is a "being-to-the-world" as "a subject of perception and behavior as well as cognition and reflection." He questions the notion of the body as an object:

Classical psychology... stated that my body is distinguishable from the table or the lamp in that I can turn away from the latter whereas my body is constantly perceived. It is therefore an object which does not leave me. But in this case is it still an object?" (Merleau-Ponty, 1962, p. 90)

Merleau-Ponty illustrates that an object is standing in front of us and it is observable. He distinguishes the body away from an object:

[An object is an object only insofar as it can be moved away from me, and ultimately disappear from my field of vision. Its presence is such that it entails a possible absence. Now the permanence of my body is entirely different in kind: it is not at the extremity of some indefinite exploration; it defines exploration and is always presented to me from the same angle. Its permanence is not the permanence in the world, but a permanence on my part. To say that it is always near me, that I cannot array it before my eyes, that it remains marginal to all my perceptions, that it is with me. (ibid., p. 90)

The body never leaves me, but is with me. Merleau-Ponty continues to clarify the difference between the body and an external object:

In so far as it sees or touches the world, my body can therefore be neither seen nor touched. What prevents it ever being an
object, ever being "completely constituted" is that it is that by which there are objects. It is neither tangible nor visible in so far as it is that which sees and touches. The body therefore is not one more among external objects, with the peculiarity of always being there. (ibid., p. 92)

Moreover, the body as a corporeal schema is the very condition of our access to space in which we grasp the idea of the external environment. The body is not in space like things; it inhabits or haunts space. In other words, we are bodily existing in a world, and recognize the external environment and identify ourselves by bodily experiences. In his *The Primacy of Perception*, Merleau-Ponty (1964) describes, the body applies itself to space like a hand to an instrument, and when we wish to move about we do not move the body as we move an object. We transport it without instruments as if by magic, since it is ours and because through it we have direct access to space. For us the body is much more than an instrument or a means; it is our expression in the world, the visible form of our intentions. (p. 5)

Thus, beyond Cartesian mind/body dualism, the body is not an instrument or a means that we just use and can move it away from us. The body, the visible form of our intentions, is our being. It is how we know about the external world.

The body is also a sensuous being. In his *The Sensuous Universal*, Pilotta (1995) elaborates on Marx's concept of the species-being of social sensibilities and illustrates phenomenological
intersubjectivities to interpret carnal communication exercised by sensuous bodies. He clarifies the relation between the body and consciousness with a sensuous universal view. Furthermore, he points out the importance of body movement for being in the world.

I am conscious of my body's sensitivity to my sense organs and their mobilizing effect. This consciousness is the recognition of myself in this body; i.e., I recognize as mine different parts of this body which make up the ego-identity that is maintained across an interconnected sequence of conscious states.

My body is given to me as consciously alive. It is sensitive, susceptible, affective, and kinesthetic. The body as a sensation-field is polarized by vectors of axis of stance and of motility, that are kinesthetically felt. My body is a field of sensation which gives me a sense not only of what objects confront me, but also how I stand and move in their midst. My body is also something that I can perceive tangibly by external perception... This sensitivity to my own body is perceived sensuously and identified through movement: movement mediates this identification. (Pilotta, 1995, p. 83-84)

Indeed, the body is a field of sensation in which we make sense by perceiving things. Thus, the body is sensuously and consciously living, perceiving and moving by which we identify ourselves. From a view of phenomenological sociology, O'Neill (1989) claims that the social capacity of this phenomenal body is "the foundation of all other institutions, whether of political economy, history, or science, or of philosophy, the arts, and psychoanalysis" so that he calls this
"the communicative body" (p. 3). "The communicative body is the hinge of our world; it establishes an identity-within-difference that overrides the subject-object dualism of transcendental phenomenology" (ibid., p. 16). To reconsider the relationship between mind and body, O'Neill continues to explain that our minds are unthinkable except around our bodies.

Because we are embodied beings, our thoughts and senses are not our own activities, absolutely speaking, because we are already in the world as a world from which all our sensory activities, speech, and thought derive, but around a heartbeat that precedes them. Our mind is unthinkable except around its body: "There is a body of the mind, and a mind of the body and a chiasm between them". The mind's body is not the objective body, not the body thought of the mind, but the phenomenal body, the field that reverses everything in it as sensible, as content or dimensionality of my being-in-the-world. (O'Neill. 1989, p. 21)

By chiasm, Merleau-Ponty means that there is not only a me-other rivalry, but a co-functioning. We function as one unique body. "The chiasm is not only a me other exchange, it is also an exchange between me and the world, between the phenomenal body and the 'objective' body, between the perceiving and the perceived" (Merleau-Ponty, 1968, p. 215). Pilotta (1995) also expresses that chiasm can be understood as time which in turn is negativity. He explains that "the lived corporeity is a reversibility or counter-perception which is a doubling up of corporeity: intercorporeity. This
locus of doubling Merleau-Ponty calls the negative" (Pilotta, 1995, p. 175-176). The body is the phenomenal body and the objective body at the same time due to intercorporeal function of chiasm.

O'Neill (1989) also demonstrates the phenomenal body as the matrix of human existence. The phenomenal body sensuously perceives the world and offers its actions to experience being-in-the-world. He explicates that the body is the center around which the world is given as a correlate of its activities. Through the phenomenal body we are open to a world of objects as polarities of bodily action. The phenomenal body is a modality of being-in-world which is privileged because it is the archimedean point of action and neither a passive agency of sensory perception nor an obstacle to idealist knowledge. (p. 57)

In terms of relationship between the body and meaning, Pilotta and Mickunas articulate corporeality with the process of signification; i.e., a communicative practice. Corporeality becomes the central unity practicing the generation of meaning. On the other hand, the sensory bodily experience emerges before the process of signification in a communicative context. In other words, there is nothing meaningful before bodily experiences. Pilotta and Mickunas (1990) explicate that.

The notion of signifying and the signified assumes here a corporeal base resulting in a process of signification such that although signifying the things and events in the field, the corporeal gestures and concrete expressions are in turn
signified by objective terms and events. The function of corporeal processes, the gestures and linguistic vocalizations, efface themselves before the signified, the pointed to. Their meaning is not read by observing the body, but by observing the phenomena toward which the body is oriented... the terms (the subjects and events in the field) signify and point to each other by way of location of our bodies... my body is never completely extricable from the field, but is always engaged in a concrete communication with it. (p. 74)

Since the process of signification is a bodily communicative practice, corporeity is powerful to disclose the meaning of the outside environment around the body. Pilotta and Mickunas continue. This process of communication among sensations that are constantly transcended toward the meaning units and the field in which such units function, is traced by the corporeal gesture constituting an expression of the very sensations and their transcendence toward contextualized things as meaning units. In this sense, corporeity is the basic communicative power:

Corporeity is the power that reveals the meaning of the perceptual field... (ibid., p. 77-78)

Therefore, the phenomenal body is communicative and powerful to articulate meanings in the process of signification. Moreover, in communicative contexts, the bodily experience is presubjective and preobjective in the position of interpretation. In the experiential domain, the sensuous body perceive the objects
around it; in the transcendental domain, the conscious body is the power to reveal the meaning of the living being.

The Political Body

While Merleau-Ponty focuses on the phenomenal being of the body, Nietzsche puts the body into a political and social context. Besides seeing the bodily practice as interpretation, the body, for Nietzsche, is also called "political organization." In Nietzsche's concept, as Grosz (1994) explains, "it is the body, both at an intraorganic or cellular level and as a total, integrated organism, an animal, that is active, the source and site for the will to power and the movement of active forces. Knowledge and power are, for Nietzsche, the results of the body's activity, its self-expansion and self-overcoming" (p. 122).

For Nietzsche, the body is described as follows:

[An] extraordinary collectivity of living beings, all of them dependent and subordinate, but in another sense dominant and endowed with voluntary activity. . . . In this 'miracle of miracles,' consciousness is merely an 'instrument,' nothing more, - in the same sense in which the stomach is an instrument of the same miracle. (Nietzsche, 1966; cited in Blondel, 1991, p. 230)

In this sense, the consciousness is not the privilege of the conscious intellect; in other words, "moral thought follows our conduct, it does not direct it." Moreover, the body as a political structure is based on relations between multiple and unstable forces. As Blondel explains,
The body is not a machine, but a political organization based on relations between forces that are unstable and not univocally regulated by conscious causal logic: there is no submissive obedience or function that is harmoniously regulated by laws. What is the rule of composition of these forces? Nietzsche considers the mechanism as only being 'symbolical' of the organism and the physical world. (Blondel, 1991, p. 232)

Nietzsche interprets the body as a multiplicity (or plurality) of forces. "the result of suppression or subordination of the multiple conflicting forces" (Grosz, 1994, p. 122). Blondel (1991) explains Nietzschean concept of the body as "plurality of intellects" to reveal the radical nature of plurality (p. 207). In other words, the body is an intermediary space between the absolute plural of the world's chaos and the absolute simplification of intellect. As Blondel writes. The body being the principal agency in which the chaos of the world is first reduced by each drive and then pluralized once again: the body, as a unity and plurality, is the site of the interpretation that establishes the chaos of the world in plural units, or signs. (Blondel, 1991, p. 214)

Nietzsche also explicates the body as an entity of interpretation and refers the body to a metaphorical domain-politics in which the body is not only a totality of perceptions, but also a multiple complexity of dynamic and plural forces.

The assumption of a single subject is perhaps unnecessary: perhaps it is just as permissible to assume a multiplicity of subjects whose interaction and struggle is the basis of our
thought and our consciousness in general? A kind of "aristocracy of cells" in which dominion resides? To be sure, an aristocracy of equals, used to ruling jointly and understanding how to command?

My hypothesis: The subject as multiplicity. (Nietzsche. 1968. p. 270)

The body is a great intelligence, a multiplicity with one sense, a war and a peace, a herd and a herdsman. (Nietzsche. 1985; cited in Blondel, 1991, p. 210; also in Grosz, 1994, p. 127)

This multiplicity of intelligence or forces is political. As Nietzsche explores, the human being is "a plurality of wills to power." In a political sense, the bodily being struggles in-between a plurality of dominant and subordinated positions. The bodily being will recognize

... a plurality of living beings which, struggling or collaborating among themselves, or submitting themselves to one another, affirm their individual being and so involuntarily affirm the whole. Among these living beings, there are some which are more masters than subalterns; among these masters there is once again struggle and victory. (Nietzsche. cited in Blondel. 1991. p. 231)

This is a dynamic and political multiplicity in-between the relationship of dominion and subordination. For the political power relation, Nietzsche suggests "a forever floating delimitation of power" for our bodily life. He explains.
To begin with the body and physiology: why? - In this way we get an exact representation of the nature of our subjective unity, created from a group of leaders at the head of a collectivity. . . ; we understand how these leaders depend on those they rule over, and how the conditions for a hierarchy and a division of labour create the possible existence of bitty beings and the whole. . . ; how struggle is expressed even in the swapping around of commandment and obedience and how a forever floating delimitation of power is necessary for life. (Nietzsche, 1968, p. 271)

Thus, for Nietzsche, the domination of a group or unity is precarious because plurality is constantly emerging. As Blondel (1991) describes. "life is the instability of power-relations. there is no domination, only a struggle to predominate within me" (p. 233).

Thus, knowledge is constructed within this instability and is not a reflection on things, but a practice, a strategy, a struggle, or a battle. "Bodies construct systems of belief, knowledge, as a consequence of the impulses of their organs and processes" (Grosz, 1994, p. 126). In other words, knowledge can be seen as a bodily strategy, or rather a resource, which contributes to the will to power. The body, the resource of knowledge, is political in a struggle of plural forces. This is what Foucault calls the "body politic."

**The Body Politic**

For Nietzsche, the body is the agent and active cause of knowledge, while for Foucault the body is the field in which the play of powers, knowledges and resistances is worked out. Moreover.
Foucault's concept of the body is a kind of passivity, capable of being mobilized according to the interests of power or in the forms of subversion, depending on its strategic position. But, for Nietzsche the body is the site for the emanation of the will to power. Foucault points out the idea of a social body constituted by the universality of wills. He explains that "now the phenomenon of the social body is the effect not of a consensus but of the materiality of power operating on the very bodies of individuals" (Foucault, 1980, p. 55). This materiality of power operating on the bodies is the history of bodily inscription. Following Nietzsche's use of genealogy, Foucault use genealogy as "discrete, disparate, often randomly connected material conjunctions of things or processes" (Grosz, 1994, p. 145).

The body, for Foucault, is not only the central schema in the experiential domain, but also articulates history and knowledge. In his "Nietzsche, Genealogy, History," Foucault (1984) explicates that genealogy is an analysis of the interrelation between the body and history. He writes that.

The body - and everything that touches it: diet, climate, and soil - is the domain of the Herfunft. The body manifests the stigmata of past experience and also gives rise to desires, failings, and errors.

The body is the inscribed surface of events (traced by language and dissolved by ideas), the locus of a dissociated self (adopting the illusion of a substantial unity), and a volume in perpetual disintegration. Genealogy, as an analysis of descent, is thus situated within the articulation of the body and history.

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Its task is to expose a body totally imprinted by history and the process of history's destruction of the body. (Foucault, 1984, p. 83)

The body seems to be affected by historical process in which the body learns to confine itself and to maintain and conciliate the relation with power. In a historical and cultural context, the body is constructed by a political practice which struggles and disciplines the body. In his *Discipline and Punish*, Foucault (1979) stresses this body politic "as a set of material elements and techniques that were as weapons, relays, communication routes and supports for the power and knowledge relations that invest human bodies and subjugate them by turning them into objects of knowledge" (p. 28). By politics, Foucault means "a technique of internal peace and order, which sought to implement the mechanism of the perfect army, of the disciplined mass, of the docile, useful troop, of the regiment in camp and in the field, on manoeuvres and on exercises" (ibid., p. 168). Thus, in the body politic, a body-subject of the being is constituted by multiple power relations.

The body is indeed the privileged object of power's operations: power produces the body as a determinate type, with particular features, skills, and attributes. Power is the internal condition for the constitution and activity attributed to a body-subject. (Grosz, 1994, p. 149)

In other words, in the body politic, the body is the subject and the object as two sides of the same coin.
Like Nietzsche, Foucault believes that power of the body politic operates a multiplicity of forces. "Power is not an institution, and not a structure." "Power is everywhere because it comes from everywhere." Power is "permanent, repetitious, inert, and self-reproducing, is simply the over-all effect that emerges from all these mobilities, the concatenation that rests on each of them and seeks in turn to arrest their movement" (Foucault, 1978, p. 93). Furthermore, the bodily movement is not only disciplined by power, but also struggling within the unbalanced and unstable multiplicity of forces. Foucault (1978) illustrates that,

power must be understood . . . as the multiplicity of force relations immanent in the sphere in which they operate and which constitute their own organization; as the process which, through ceaseless struggles and confrontations, transforms, strengthens, or reverses them . . . (p. 92)

Thus, the body, for Foucault, is directly involved in a political field. As he describes, "power relations have an immediate hold upon [the body]; they invest it, mark it, train it, torture it, force it to carry out tasks, to perform ceremonies, to emit signs" (Foucault, 1979, p. 25). Foucault continues that,

This political investment of the body is bound up, in accordance with complex reciprocal relations, with its economic use; it is largely as a force of production that the body is invested with relations of power and domination; but, on the other hand, its constitution as labor power is possible only if it is caught up in a system of subjection (in which need is also a political
instrument meticulously prepared, calculated and used); the body becomes a useful force only if it is both a productive body and a subjective body . . . there may be a "knowledge" of the body that is not exactly the science of its functioning, and a mastery of its forces, that is more the ability to conquer them: this knowledge and this mastery constitute what might be called the political technology of the body. (ibid., p. 25-26)

In addition, unlike Marxist concept of ideological repression or hegemony, the power relation, according to Foucault, does not direct only from top to bottom, but is also considered from bottom to top. In other words, Foucault opens up the possibility of resistance. He emphasizes that "what had made power strong becomes used to attack it. Power, after investing itself in the body, finds itself exposed to a counter-attack in that same body" (Foucault, 1980. p. 56). Thus, the body becomes a struggling field of multiple unstable forces. In terms of resistance, Foucault (1978) points out that.

Where there is power, there is resistance . . . this resistance is never in a position of exteriority in relation to power. . . [The existence of power relationships] depends on a multiplicity of points of resistance: these play the role of adversary, target, support, or handle in power relations. These points of resistance are present everywhere in the power network. . . the points, knots, or focuses of resistance are spread over time and space at varying densities, at times mobilizing groups or individuals in a definitive way, inflaming certain points of the body, certain moments in life, certain types of behavior. (p. 96)
In general, the body has intimate relation with consciousness. The body as a corporeal schema grasps the idea of external environment in the experiential domain. The body is sensuous universal to mediate identification through movement. The phenomenal body is a basic mode of being-in-the-world. The political body articulates with history and it is the subject and the object of knowledge and power practice. The body is a political field in which multiple unstable forces are struggling.

Summary

In this chapter, technoscience is defined as a mediational structure which constructs specific meanings of gender in the process of signification. It could be seen as a cultural model of genderization. The major feminist arguments in technoscience have been reviewed and discussed with three perspectives: gender equality, social/cultural construction, and sexual difference. The major areas of contestation in these arguments might present dualisms in the technoscientific discourse, cultural inscription of gender, hierarchy and power relation in cultural dualisms, and resistance implications in feminist discourses. However, the problematic of binary oppositions could make scholars focus on two sides of arguments but fail to consider the possibilities of the in-between. The mind/body dualism, indeed, would suppress the in-between interactions because mind and body are two opposed categories in which one is in opposition to the other in the practice of dualism. The body actually is not only sexually determined but also constitutive of multiple forces which might come from various social, cultural, and historical
power relations. Thus, it might be significant to rethink how the body politic of unstable multiplicity is formed and how the female body is constituted in the technoscientific body politic. Finally, the body theories like Merleau-Ponty's phenomenal body, Pilotta's sensuous body, O'Neill's communicative body, Nietzsche's political body, and Foucault's body politic have been reviewed in this chapter.
CHAPTER 3

METHODOLOGY

In the previous literature review, the problematic of binary oppositions in gendered technoscience has shown the limitation of arguments in one side or the other. To critique the binary opposition, Derrida points out that one member of the pair is privileged, freezing the play of the system, and marginalizing the other member of the pair. In Derrida's notion of deconstruction, the first step is to focus on the binary oppositions within a text and show "how these opposites are related, how one is central, natural and privileged, the other ignored, repressed and marginalized"; secondly, deconstruction "temporarily undoes or subverts the hierarchy to make the text mean the opposite of what it originally appeared to mean"; finally, "both terms of the opposition are seen dancing in a free play of non-hierarchical, non-stable meanings" (Powell, 1997, p. 25-30). In other words, to rethink phallocentric discourse in technoscience, the first step could be to find that the opposite sex might show the possibility to change the binary relation; secondly, to undo the hierarchical position, the opposite one as a political organization could become a master in the relation; thirdly, to put into an unstable situation, the subject could be dancing in a play of
the in-between (a play of *differance*) beyond the binary oppositions. From the above explanation, the three major themes of deconstruction as the interpretive concepts will be demonstrated as the main structure of this study:

1. opening the possibility for change;
2. legitimating the inappropriate/marginalized otherness;
3. dancing in a play of the in-between.

Deconstruction is a way for me to read the female corporeal existence in technoscience. Thus, in order to undo the hierarchy of male dominance in the technoscientific discourse, I attempt to focus on reading the female bodily experiences which have been seen as the other/inappropriate. ignored. and marginalized opposites: moreover. I'd like to see how the sexual differences can dance in a free play of non-stable meanings. The other/inappropriate/ignored/marginalized experience is the most important open-up possibility or impossibility in a deconstructive sense. In an interview with Derrida, Caputo (1997) writes that.

Derrida says he likes the old word 'experience,' taken not in the traditional, dusty phenomenological sense, which means to perceive what presents itself, but rather when it is 'dusted of' a little so that it can take on a deconstructive sense. Then 'experience' means running up against the limits of what can never be present, passing to the limits of the unpresentable and unrepresentable, which is what we most desire, namely, the impossible. (p. 32-33)
Thus, deconstruction can be seen as a way by which the unpresentable, unrepresentable and impossible experiences can have a free play in the discourse.

In addition, to seek the possibility of a plurality of political concerns in the technoscientific discourse, deconstruction is not to destroy the technoscientific discourse but rethinks the impossible as possible otherwise and interprets it as a multiplicity inside of the text itself. "That is what gives deconstruction its movement, that is, constantly to suspect, to criticize the given determinations of culture, of institutions, of legal systems, not in order to destroy them or simply to cancel them, but to be just with justice, to respect this relation to the other as justice" (Caputo, 1997, p. 18). In deconstruction, the theme is not only to deconstruct the traditional concept of politics, but also to think of another way of interpreting politics; namely, to think politics otherwise. To deconstruct the political tradition is "not in order to depoliticize but in order to interpret differently the concept of the political, the concept of democracy..." (Caputo, 1997, p. 18). Therefore, in order to deconstruct the traditional cultural politics of technoscience in association with masculinity, objectivity, and rationality, deconstruction provides an interpretative way which exceeds the boundaries of hierarchical hegemony in the binary opposition and unstablizes the definable and determinable meanings with multiple different political concerns. By reading the female bodily experiences in technoscience, this study attempts to reconsider the
different politics of power, discipline, struggle, resistance, and so forth in the multiplicity of the female body.

In the first part of this chapter, text reading will be discussed as a free play of interpretation; also, the two reading texts of this study will be introduced. Furthermore, Derrida’s notion of deconstruction as an interpretative tool will be explained in the second part.

Reading Text: Interpretation

Textual analysis must be articulated with many kinds of sustained scholarly interaction among living people in living situations, historical and contemporary, documentary and in vivo. These different studies need each other, and they are all theory-building projects. (Haraway, 1997, p. 191)

Since my main concern is to build up a theory or concept by text reading, it is important to my work to articulate female corporeal experiences as living situations in technoscience with a scholarly deconstructive practice. This is a theory-building project to contribute a deconstructive interpretation for the study of the female corporeity in technoscience.

In order to read the texts, the first definition question is what a text is. According to O'Sullivan, Hartley, Saunders and Fiske (1994) in *Key Concepts in Communication*, text refers to a signifying structure composed of signs and codes which is essential to communication. Books, records, letters, photographs are texts, so too is a recording of a television show or a transcript of speech. Text has a physical existence of its own, independent of its sender or receiver.
and composed of representational codes; on the other hand, text implies the definition "that which is central to the generation and exchange of meaning" (O'Sullivan et al., 1994, p. 317). It is interesting that the meaning generated from a text is not one. Text can involve different readings by different readers. In his "Encoding/decoding," Hall (1980) asserts that there might be three kinds of readings in the same text: preferred reading, negotiated reading, and oppositional reading. In the preferred reading, the readers interpret the text in a way as the sender (or the dominant culture) wants them to understand; but many readers probably understand the text with a negotiated reading by which they may negotiate their understanding of the text with their social and cultural conflict; in the oppositional reading, the reader understands the text in an opposite way against what the sender operates or the dominant culture exercises. This notion of three readings might be arguable because Hall, first, merely emphasizes the relationship of encoder and decoder without considering the text itself, and secondly, his three categories of readings seemingly imply the meaning of the author's (or the sender's) dominance; thus, he might ignore the free play of the readings in the text itself. As a matter of fact, text is a field that polysemic readings can play. Indeed, text as an unstable field might not be seen as being unproblematic but it is capable of being interpreted in a variety of ways, depending on the socio-cultural background and experience of the reader.

Ricoeur (1991) defines that a text is any discourse fixed by writing. The reader is absent from the act of writing; the writer is
absent from the act of reading. The writing-reading relation is not a particular case of the speaking-answering relation. It is not a relation of interlocution, not an instance of dialogue. Writing calls for reading in a way that will enable us to play the function of interpretation. Ricoeur (1991) asserts that "the text is not without reference: the task of reading, qua interpretation, will be precisely to fulfill the reference" (p. 109). Interpretation as a movement might fulfill our understanding and try to provide us a possible way out of our suspense of the text. Ricoeur also tries to distinguish the difference between explanation and interpretation; he describes that by reading we can prolong and reinforce the suspense that affects the text's reference to a surrounding world and to the audience of speaking subjects: that is the explanatory attitude. But we can also lift the suspense and fulfill the text in present speech. It is this second attitude that is the real aim of reading. For this attitude reveals the true nature of the suspense that intercepts the movement of the text toward meaning..." (ibid., p. 118).

Thus, interpretation is a way to reveal the true nature of the suspense in the text, while explanation refers the text to our perceiving world. Interpretation might see the suspense of the text in depth, not only referring it to something else. Ricoeur continues that "if reading is possible, it is indeed because the text is not closed in on itself but opens out onto other things. To read is, on any hypothesis, to conjoin a new discourse to the discourse of the text. This conjunction of discourses reveals, in the very constitution of the
text, an original capacity for renewal that is its open character. Interpretation is the concrete outcome of conjunction and renewal" (ibid.). Interpretation might open up a new discourse or possibility to rethink the text in a different way. Thus, text is an open field in which the free play of interpretation can be employed. However, "a text is an organism, a system of internal relationships that actualizes certain possible connections and narcotizes others," as Eco (1990) asserts, "it is possible to make that text say many things-in certain cases a potentially infinite number of things-but it is impossible-or at least critically illegitimate-to make it say what it does not say... The internal textual coherence controls the otherwise uncontrollable drift of the reader" (p. 148-149). Therefore, no matter how freely the interpretation can play in a text, the revelation or fulfillment of interpretation should not be operated outside of the text. Text is an open field of free play for the reader or interpreter; however, it can never play outside of the text itself.

In my study, text reading is a basic way that I will apply to analyze the stories of female bodily experiences in technoscience. Interpretation is the most significant tool by which I read those stories; and, deconstruction is the concept from which I interpret those texts. Indeed, those stories as texts are open to the readers who might try to reveal a new discourse inside of the text and reconsider the possible or impossible otherwise in the text. The texts of this reading study are two books: *Alone in a Crowd*, inscribing women's stories in non-traditional jobs; and *Who Succeeds in Science*, a survey study and a focus interview on gender and scientific
careers. The reasons that I choose these two books are: first, both provide female experiences in careers of male dominance, one about blue-collar workers, the other about scientific researchers in academic schools; secondly, both inscribe life stories not only about what happened in the past and current but also about how they felt in their situations; not only about their technoscientific occupations but also about their personal lives in relation to their professional careers; namely, they are not fictional stories like those Haraway narratively analyzed, but real bodily experiences. Moreover, unlike the book *Working* (Terkel, 1974), which generally includes various working stories in male dominance as well as female dominance like nurse, secretary, teacher, clerk and even housewife, both books that I choose only talk about female experiences precisely in those jobs of male dominance. On the other hand, not only do they focus on their technical and social experiences in confrontation of their professional careers like the book *Laboratory Life* (Latour and Woolgar, 1979) does, but also those stories involve their personal life which may influence or be influenced by their non-traditional male dominant jobs. In those texts, the working and living experiences interweave to construct the subject self. Therefore, these are the texts that I want to seek inside and look for how the multiplicity of power, discipline, struggle, and resistance forms the female body in technoscience.

In *Alone in a Crowd*, the twenty-five women in this book are a diverse group. They are employed in some of the Pacific Northwest's most important industries, such as aerospace, shipbuilding, maritime,
and forestry; no two are in the same trade. They range in ages from twenty-four to sixty-nine. They are white, black, Asian, Chicana, and native American. They are straight and gay, married and single, and divorced. Some are parents and some are not. For some, being successful in a trade means upward social mobility from minimum-wage jobs and welfare. For others, it was seen as moving down the social scale from a profession. The editor, Jean Reith Schroedel (1985), tries to help bridge the isolation experienced by women in non-traditional work, and create a real picture for women considering non-traditional occupations. And most important theme for Schroedel is to help overcome women’s silences in non-traditional jobs. The book is organized into five sections: feminism, occupational safety and health, race, unions, and family. But, the placement of stories into the different sections is somewhat arbitrary. Although many stories involve multiple themes, Schroedel tries to organize them according to themes which the interviewees especially emphasized.

Schroedel’s interview questions include: first, the individuals’ background and motivations for entering a trade; secondly, finding out about the woman’s on-the-job experiences—training, finding a job, physical surroundings, using tools, health hazards, unions, socializing with co-workers, discriminations, and so forth; thirdly, sharing about the more complex emotional issues of how non-traditional work affected the woman’s family and self-perceptions. Schroedel used tape record and then transcribed the tapes and wove each interview into a unified story. Every edited story was sent to the woman
interviewed for her approval. In most cases, the interviewees chose
to use her own name, but there were seven cases using pseudonym.

hundred face-to-face interviews with former postdoctoral fellows in
science across the U.S. From two hundred cases, Sonnert chose ten
female and male successful scientists by academic rank,
departmental prestige, and publication productivity. On the other
hand, ten cases of leaving scientific careers were also chosen and
featured, but no case was chosen from which a severe illness or some
other personal tragedy forced the person out of science.

Sonnert presents the profiles of ten former postdoctoral fellows
who embark on an academic science career and reach what might be
considered the top of their profession. The interviewees tell their
stories and discuss their lives and career paths—some well
established, others nearer the beginning—the fortuitous twists and
turns that led to their success, and the obstacles they encountered:
also, they share about their scientific working style and details of
their private and family lives. On the other hand, there are ten
stories of women and men who left scientific careers and talked
about the obstacles, difficulties and dissatisfactions that they
encountered as scientific researchers. All the profiles are based on
extensive interviews. To protect the anonymity of these women and
men, pseudonyms are used in all the cases. As Sonnert (1995) says,
"as you read these life stories, you will undoubtedly discover specific
insights relevant to your own situation" (p. 16). Indeed, these stories
as texts are open to be interpreted. Though Sonnert provides both
men's and women's experiences, I will focus on women's stories and see how their body politic works in technoscience.

Deconstruction

If there were continual stability, there were be no need politics... Chaos is at once a risk and a chance, and it is here that the possible and the impossible cross each other. (Derrida, 1996, p. 84)

Deconstruction opens a theoretical and methodological analysis which might destabilize, subvert and complicate writing and reading as well as meaning systems and communicative cultures. Beyond semiotics, deconstruction is concerned with not only the relationship among the signifier, the signified and the sign, but also the meaning producers - the human subjects. It shows not only the play of writing but the possibility and impossibility of intersubjectivity. To challenge the reliability of intersubjectivity, deconstruction promotes a text reading "built upon disclosive yet constructive aspects of an understanding held to be neither determinately intersubjectivity nor subjective" (Desilet, 1991, p. 153). In deconstruction, "any sign can mean anything at any time, depending upon the range and the quality of the contexts within which language-users use and interpret it" (ibid., p. 166). This undecidability of interpretation is seen as a process of understanding that have no necessary connection with recollection, history, or collective trends. As Chang (1996) describes, deconstruction is

unswervingly text specific; its apparent open-ended, exorbitant transgression of established textual borders is always relative
to and rigorously structured by an unfree target text whose meaning structure delimits the uneasy horizon of all deconstructive activities. (p. xii)

A deconstructive critique is against logocentrism; namely, to decentralize logos, truth, reason and law. As Derrida (1990) puts it, "the increasingly powerful historical expansion of a general writing, of which the system of speech, consciousness, meaning, presence, truth, etc., would be only an effect, and should be analyzed" (p. 20). Deconstruction attempts to reveal the absent, marginalized, hidden impossibility in the truth, reason and law and presents how the impossible can be the center. Thus, Caputo (1997) writes that, "deconstruction is the relentless pursuit of the impossible, which means, of things whose possibility is sustained by their impossibility, of things which, instead of being wiped out by their impossibility, are actually nourished and fed by it" (p. 32).

In addition, Derridian concept of "nothing but the text" tries to find a way out of material existence of ideology. The text is a field of free play in differences. As Derrida (1982) states, every sign . . . can break with every given context, and engender infinitely new contexts in an absolutely nonsaturable fashion. This does not suppose that the mark is valid outside its context, but on the contrary that there are only contexts without any center of absolute anchoring. (p. 320)

Human beings are the subjects who play the contextual games in which there is nothing but only the text. In deconstruction, all communications, all utterances, all signs contain as their structure.
"the possibility of separation from their senders, their speakers, their referents" (Poster, 1990, p. 109). This postulate is at the heart of deconstruction and is central to its heuristic strength.

In terms of the position of the author, many scholars have argued that the author or narrator was seen as a hierarchy of discourses so that the dominated single voice from the author or narrator was omniscient and omnipotent. However, in deconstruction, the author seems absent or dead in the text reading. Derrida (1990) writes that,

For a writing to be a writing it must continue to "act" and to be readable even when what is called the author of the writing no longer answers for what he has written, for what he seems to have signed, be it because of a temporary absence, because he is dead or, or more generally, because he has not employed his absolutely actual and present intention or attention, the plenitude of his desire to say what he means, in order to sustain what seems to be written "in his name." (p. 8)

In his "The Death of the Author," Barthes (1977) asserts that "the birth of the reader must be at the cost of the death of the author" (p. 148). Barthes argues that "a text is made of multiple writings, draw from many cultures and entering into mutual relations of dialogue, parody, contestation, but there is one place where this multiplicity is focused and that place is the reader. . . " (ibid.). Separated with the author, the speaker, or the sender, the reader (or the receiver) becomes the player of interpreting texts. Eco (1992) also claims that "the attempt to limit the range of relevant meaning-conferring
contexts or to halt the endlessly self-dissolving instabilities of writing has been stigmatized as 'authoritarian'-a charge which is itself an example of the readiness with which complex theoretical questions have been linked to wider political attitudes" (p. 7). Thus, in deconstruction, any possible or impossible meaning can be the center of the text which can be read without the original thought of the author. The center of the text can be displaced over and over so that no hierarchical meaning can happen in deconstructive activities.

**Deconstruction: An Unstable Field**

Some scholars, like Norris, think that deconstruction is "irrational," because "it fails to respect the basic protocols of logic, argumentative consistency, enlightened discourse, but only be means of an evasive tactic that leaves those criticisms firmly in place from any but a counter-enlightenment or irrationalist standpoint" (Norris, 1996, p. 140-141). However, others, like McCarthy, argue that deconstruction cannot rid us of the concepts fundamental to Western rationalism. But it just, again and again, "transform [them], to displace them, to turn them against their presuppositions, to reinscribe them in other chains, and little by little to modify the terrain of our work and thereby to produce new configurations" (McCarthy, 1991, p. 99). Thus, McCarthy asserts that deconstruction "organizes a structure of resistance" to the dominant conceptuality.

Atkins points out that "deconstruction may disillusion us about mastery as it demonstrates just how precarious our grasp on meaning is. We are and are not masters, therefore no masters. But we must be careful not to fall into the trap of believing in linear
progress" (Atkins, 1983). Therefore, deconstructive players play an irrational deconstructive practice to deconstruct rationalism which we can not get rid of but we can transform and displace it to decentralize the master.

It is significant that deconstruction takes nothing for granted. It raises doubts and questions of existing systems or cultural mechanisms which used to be taken for granted and seen as nature. "The object of study (a work of literature, for instance) is in fact not a warrant for its own reading. On the contrary, deconstruction is dedicated to teasing out the repressed, marginalized and absent in the chosen discourse" (O'Sullivan et al., 1994, p. 304).

Like the above argument of binary oppositions, Derrida asserts that traditional metaphysical thinking favors: (1). establishing through opposition a hierarchy in which one value emerges an inherently subordinate to another; and (2). establishing through opposition an ideal or historical order in which one value is inherently prior and paramount and the other derivative or arbitrary (Desilet, 1991, p. 157). Deconstruction as a critique of concepts and hierarchies attempts to escape from the traditional criteria of certainty, identity and truth which have achieved their status by repressing and forgetting other elements so that those elements become the un-thought or the unthinkable (Fowler, 1991, p. 54). This mechanism of repressing others to be forgotten or unthought is the process to establish certainty and stability in modern cultures. Derrida calls this process "a violent hierarchy."
terms dominates the other, occupies the commanding position. To deconstruct the opposition is above all, at a particular moment, to reverse the hierarchy” (Derrida, 1981; cited from Culler, 1982, p. 85) Thus, deconstruction must

... put into practice a reversal of the classical opposition and a general displacement of the system... deconstruction will provide the means of intervening in the field of oppositions it criticizes and which is also a field of non-discursive forces... Deconstruction does not consist in moving from one concept to another, but in reversing and displacing a conceptual order as well as the nonconcept order with which it is articulated. (Derrida, 1993, p. 21)

Derrida explains the risk and chance of deconstruction and its politics cross possibility and impossibility:

All that a deconstructive point of view tries to show, is that since convention, institutions and consensus are stabilizations (sometimes stabilizations of great duration, sometimes micro-stabilizations), this means that they are stabilizations of something essentially unstable and chaotic. Thus, it becomes necessary to stabilize precisely because stability is not natural; it is because there is instability that stabilization becomes necessary; it is because there is chaos that there is a need for stability. Now, this chaos and instability, which is fundamental, founding and irreducible, is at once naturally the worst against which we struggle with laws, rules, conventions, politics and provisional hegemony, but at the same time it is a chance. a
chance to change, to destabilized. **If there were continual stability, there were be no need politics,** and it is to the extent that stability is not natural, essential or substantial, that politics exists and ethics is possible. Chaos is at once a risk and a chance, and it is here that the possible and the impossible cross each other. (Derrida, 1996, p. 83-84)

Thus, the politics of deconstruction is rooted in a response to a call of the other that has been repressed and denied by the hegemony of logocentrism in which the system of speech, consciousness, meaning, presence, truth, would be only an effect under the increasingly powerful historical expansion of a general writing (Derrida, 1993, p. 20). To deconstruct is "to desediment, destabilize, uproot, and overturn inherited concepts and schemes, to turn them against their own presuppositions, to loosen, undo, decompose, and dismantle them" (McCarthy, 1991, p. 106).

However, deconstruction does not deny an existing structure, but destabilize and intervene it. As Johnson (1980) points out, "instead of a simple either/or structure, deconstruction attempts to elaborate a discourse that says neither 'either/or,' nor 'both/and' nor even 'neither/nor.' while at the same time not totally abandoning these logics either" (cited from Ellis, 1989, p. 6).

To disrupt logocentric discourse, deconstruction as a political interpretation insists on vigilant, unrelenting subversion of textual stabilities. Derrida provides the play of differance as a way not only to defer and differ meanings in the system of signification but also to decentralize the master-subject.
The Play of Differance

Derrida releases many "undecidable," radically unstable terms which can act to disrupt systematization. The most important one of these terms is "differance," a coinage which plays on two meanings of the French differer: difference - between signs as the basis of signification, and deferment - deferment of presence by the sign which always refers to another sign, not to the thing itself (Fowler, 1991, p. 55). Differance cannot be heard in French pronunciation; it exists only in writing. One can tell the difference between difference and differance only in writing. Derrida's purpose is to emphasize writing to displace and deconstruct the hierarchical position of speech. Derrida insists that differance is neither a word, a concept nor an origin. Differance may be seen as a condition of the possibility of meaning, which resists hypostatization to prevent it being taken as a master key to any structure (ibid., p. 56). Yet, no stable meaning of differance ever arrives, because it is always already suspended between two meanings: "to differ" and "to defer"-without ever settling into one or the other; namely, it can never be reduced to any one meaning at any one time (Powell, 1997, p. 119).

Derrida (1973) explains that,

Differance is what makes the movement of signification possible only if each element that is said to be "present." appearing on the stage of presence, is related to something other than itself but retains the mark of a past element and already lets itself be hollowed out by the mark of its relation to a future element. This trace relates no less to what is called
the future than to what is called the past, and it constitutes what is called the present by this very relation to what it is not, to what is absolutely is not; this is, not even to a past or future considered as a modified present. (p. 142)

In other words, differance should be presence-being that is not related to what is not—the past as well as the future. Derrida continues that,

In order for it to be, an interval must separate it from what it is not; but the interval that constitutes it in the present must also, and by the same token, divide the present in itself. thus dividing, along with the present, everything that can be conceived on its basis, that is, every being—in particular, for our metaphysical language, the substance or subject.

Constituting itself, dynamically dividing itself, this interval is what could be called spacing; time's becoming-spatial or space's becoming temporal (temporalizing). And it is this constitution of the present as a "primordial" and irreducibly nonsimple, and therefore, in the strict sense nonprimordial, synthesis of traces, retentions, and protentions . . . (ibid., p. 143).

Thus, differance, on the other hand, should divide the present in itself and by itself—both spacing and temporalizing. For Derrida, differance always enforces a dynamic balance, a restless fluctuation or "undecidability" in the hierarchy. Differance may give rise equally to contrary effects within intersubjectivity. The concept of the subject has always referred to presence. Moreover, the subject
in a system of *differance* never has a stable position due to the

There is no subject who is agent, author, and master of
*differance*, who eventually and empirically would be overtaken
by *differance*. Subjectivity-like objectivity-is an effect of
*differance*, an effect inscribed in a system of *differance*. This is
why the a of *differance* also recalls that spacing is
temporization, the detour and postponement by means of
which intuition, perception, consummation-in a word, the
relationship to the present, the reference to a present reality,
to a being-are always deferred. (p. 28-29)

Thus, Desilet (1991) explicates that subjectivity is only possible
through the play of *differance*; so too is intersubjectivity. The
subject is itself an effect of *differance*.

Further, under the practice of *differance*, Derrida explores that
a writing would exceed everything that the history of metaphysics
has comprehended. Derrida (1982) claims that *differance* would
"give us to think a writing without presence and without absence.
without history, without cause, without archia, without telos, a
writing that absolutely upsets all dialectics, all theology, all teleology,
all ontology" (p. 67). Thus, writing in Derridian thematic of
*differance* no longer has its full meaning. It would be deconstructed
and divided by spacing and temporizing. It no longer has the status
of a purely signified content of expression. Similarly, the subject in a
play of *differance* would never has its full meaning; moreover, in the
strategy of *differance*, there is no stable meaning in the system of
signification. In this sense, no subject is the master in a system of differance: in other words, the subject would be displaced and destabilized continuously in a play of differance. Hence, the subject can be decentralized and only exists and can be found in differance.

Translating Derrida's *Of Grammatology*, Spivak (1976) describes her struggling with the desire of deconstruction:

a further deconstruction deconstructs the deconstruction, both as the search for a foundation. . . and as the pleasure of the bottomless. The tool for this, as indeed for any deconstruction, is our desire, itself a deconstructive and grammatological structure that forever differs from and defers the text of ourselves. . . We must do a thing and its opposite, and indeed we desire to do both, and so on indefinitely. Deconstruction is a perpetually self-deconstructing movement that is inhabited by differance. No text is ever fully deconstructing or deconstructed. (in the translator's preface of Derrida's *Of Grammatology*, 1976, p. lxxvii-lxxviii)

As Derrida (1976) points out, "the movements of deconstruction do not destroy structures from the outside. They are not possible and effective, nor can they take active aim, except by inhabiting those structures" (p. 24). Deconstruction might also confront to be deconstructed inside of the structure itself. The endless and infinite movements of deconstruction can never fully deconstruct any text, or maybe a structure. Thus, the task of deconstruction is not to reject or discard the metaphysical structures in the text, but to reinscribe them in another way.
Deconstruction and Feminism

Since deconstruction as a political interpretation provides a way out of the hierarchical center and dominant culture, many feminist scholars show that both deconstruction and feminism, as postmodern responses, posit a world view in which a multiplicity of meanings exists and challenges the fallacious concept of dominant truth (Pearce and Natalie, 1993; Spivak, 1993 and 1997; Poovey, 1988). As Spivak (1993) puts it, in her Outside in the teaching machine.

It is that deconstruction can make founded political programs more visible. To act is therefore not to ignore deconstruction, but actively to transgress it without giving up... Feminism has a special situation here because, among the many names that Derrida gives to the problem/solution of founded programs, one is "women." (p. 121)

Some feminists have argued that Derrida approaches texts in a "feminine" manner, not only undermining the male subject that constituted them, but refusing to confront the "opponent" in a "masculine," competitive style (Rabine, 1988; Jardine, 1985). In other words, feminine manner of writing as a play of difference might displace, intervene and reverse masculine language system. Hence, Derridian deconstruction have attracted feminists "because it demonstrates that thinking in terms of binary opposition has always implied the subordination of the second term to the first. Deconstruction exposed 'man' as always occupying the privileged position, as always having set himself up as the central reference...
point" (Tierney, 1989, p. 89). Thus, Spivak (1993) suggests that feminist scholarship might keep to the critical intimacy of deconstruction to reconceptualize sexual differences not only in the writing text that deconstruction originally plays but also in any form of texts, contexts, or discourses.

It is interesting that Derrida (1988) also mentions about the subordination of femininity in sexual difference. The sexual difference, as he expresses, is erased by the victory of the masculine sex. He writes it,

when sexual difference is determined by opposition in the dialectical sense . . ., one appears to set off "the war between the sexes"; but one precipitates the end with victory going to the masculine sex. The determination of sexual difference in opposition is destined, designed, in truth, for truth: it is so in order to erase sexual difference. The dialectical opposition neutralizes or supersedes the difference. (p. 175)

Because dominant masculine sex represses and erases sexual difference, Derrida claims that "sexual otherwise" might displace and deconstruct sexual difference. He continues.

The relationship would not be a-sexual, far from it, but would be sexual otherwise: beyond the binary difference that governs the decorum of all codes, beyond the opposition feminine/masculine, beyond bisexual as well, beyond homosexuality and heterosexuality which come to the same thing. (ibid., p. 184)
Derrida believes that it is not impossible to have the multiplicity of sexually marked voices. He believes in "the masses, this indeterminable number of blended voices, this mobile of non-identified sexual marks..." (ibid.).

Spivak (1993) also asserts the importance of sexual differance in a deconstructive practice. "Sexual identity is sexual differance, not sexual difference; it produces sexual difference" (p. 132). There is only differance which allows the very possibility of differences. In other words, deconstruction opens up the multiplicity of possibility for feminists to rethink, reconceptualize, resist and intervene the male dominant structure. Thus, Spivak (1997) explicates that her attitude toward deconstruction is: "first, deconstruction is illuminating as a critique of phallocentrism; second, it is convincing as an argument against the founding of a hysterocentric to counter a phallocentric discourse; third, as a "feminist" practice itself, it is caught on the other side of sexual difference" (p. 60). The project of deconstruction is not only to critique phallocentrism-logocentrism but also to expose the ideology of the self, the identity and the culture itself or the thing itself.

Poovey (1988) points out three contributions of deconstruction for feminist studies. First, "deconstructive strategies could enable feminists to write a history of the various contradictions within institutional definitions of woman that would show how these contradictions have opened the possibility for change." Second, deconstruction can "challenge hierarchical and oppositional logic... it problematizes and opens to scrutiny the very nature of identity and
oppositional logic and therefore makes visible the artifice necessary
to establish, legislate, and maintain hierarchical thinking . . .

deconstructive strategies could enable us to chart more accurately
the multiple determinants that figure in any individual's social
position and (relative) power and oppression." Third, deconstructive
idea of the "in-between" which "constitutes one tool for dismantling
binary thinking" would "enable us to rethink 'power' so as to
perceive its fragmentary quality" (Poovey, 1988, p. 58-59). Dervin
(1996) also explores the significant and holistic view of the "in-
between" which could be seen "as an appropriate position for a
contextualist world view which mandates dialectical attention" (p.
27). Deconstruction is a play of the in-between because it is only
inhabiting in the structure of the in-between. Thus, deconstruction
can present as a powerful strategy that we can apply into the
feminist research and try to balance sexual difference with a play of
donference.

Summary

In order to deconstruct the traditional gender politics and
cultural ideology of technoscience in association with masculinity,
deconstruction might provide an interpretative way which might exceed the boundaries of hierarchical hegemony in the binary
opposition and unstablize the definable and determinable meanings
with multiple different political concerns. The three major themes of
deconstruction as the interpretive concepts will be demonstrated as
the main structure of this study:

1. opening the possibility for change:
2. legitimating the inappropriate/marginalized otherness;
3. dancing in a play of the in-between.

Since the main concern of this study is to build up a theory or concept by text reading, it is important to articulate female corporeal experiences as living situations in technoscience with a scholarly deconstructive practice. Moreover, text reading as a method makes a free play of interpretation possible; thus, a deconstructive interpretation might open up a possibility to expose texts themselves dancing in a play of the in-between. In this study, the subject in the texts will be reversed and displaced from men to women. From a deconstructive concern, the experiential and transcendental formation of the female body in technoscience will be interpreted in a play of differance. The two reading texts of this study not only focus on the female experiences in the non-traditional jobs but also inscribe the personal life stories. Since deconstruction is the interpretative concept for the text reading, Derrida's notion of deconstruction, his concept of differance, and the relationship between deconstruction and feminist scholarships have been discussed in this chapter.
CHAPTER 4

READING THE TEXT: INTERPRETATION

In this chapter, the women's stories inscribed in *Alone in a Crowd* (abbr., AC) and *Who Succeeds in Science* (abbr., WSS) will be read and interpreted to deconstruct the hegemonic ideology of male dominance in technoscience which has been claimed in association with masculinity, objectivity, and rationality. By reading those texts with a concept of deconstruction, I'd like to reconsider how the female corporeal experiences in technoscience can "challenge hierarchical and oppositional logic" of gender dualism and, moreover, discuss how the female body politic in technoscience can dance in a play of differance and demonstrate the in-between identity. Since the body can be seen as a multiplicity of forces, it is also significant to see the female body as a "site of the interpretation" (Blondel, 1991, p. 214) in which the inappropriate and marginalized otherness in technoscience could play as a master to decentralize the privileged opposite. Thus, to interpret those texts, deconstruction as a way could be a new try to reveal the female sensuous and political body in technoscience. In the following interpretation, I will excerpt some paragraphs from the texts as clues, expand interpretation in
articulation with a deconstructive practice, see how things can be otherwise, and finally, show how I justify the interpretation.

Reading a text doesn't mean to establish the privilege or authority of the interpretation, but merely show one of the possibilities that a text might tell. The "meaning" of a text "is never completely fulfilled" (Wood, 1988, p. 67). A reader can never fulfill the meaning of a text with any interpretive way but provide a different perspective to seek the possible meaning inside of the text. As Eco (1992) points out.

To say that a text has potentially no end does not mean that every act of interpretation can have a happy end . . . as maliciously suggested by Todorov, a text is only a picnic where the author brings the words and the readers bring the sense . . . To interpret a text means to explain why these words can do various things (and not others) through the way they are interpreted. (p. 24)

Text is an open field which may provide a reader freely to play. However, a free play doesn't mean misinterpretation in which a reader might develop an irrelevant interpretation outside of the text. What a reader can discover in a text must be the implication from inside of the text. Furthermore, reading a text might not have to find out what the author's original meaning or purpose is in the text. Eco asserts that, "to critically interpret a text means to read it in order to discover, along with our reactions to it, something about its nature" (ibid., p. 57). He explains that, "the nature of a given text does not mean either (a) that the interpreters must trace back to the original
intention of its author or (b) that such a text must have a unique and final meaning. There are "open" texts that support multiple interpretations, and any common agreement about them ought to concern just their open nature and the textual strategies that make them work that way" (ibid., p. 41). There is no one unique or final meaning in any text; further, any interpretation can be seen as a strategy to discover something about the nature of a text.

Therefore, reading those chosen stories with a deconstructive interpretation will show an attempt to discover something otherwise about the nature of the female bodily experience in technoscience. In the previous chapter, it has been shown that three major themes of a deconstructive practice could be the main structure of this interpretative study:

1. opening the possibility for change;
2. legitimating the inappropriate/marginalized otherness;
3. dancing in a play of the in-between.

By text reading, I'd like to see how the female phenomenal/sensuous body could be an unstable or indeterminate field which might open the possibility for technoscientific jobs in a deconstructive strategy; how this sensuous change implies an instability inside of the body; how the other/inappropriate/marginalized female body in technoscience could be politic otherwise to challenge the privileged phallocentric culture; how this female political body could be legitimated in the culture of technoscience to decentralize the mastery position; and, moreover, how the female body/subject in technoscience could dance in a play of sexual differance in the body.
politic. From a view of the body politic, those female experiences in the texts might provide an open field to rethink the relationship between the female body and machine/science/technology, and further, to discuss the female identity and subjectivity in technoscience. Thus, in articulation with a deconstructive practice, three main themes will be discussed to build a theory or concept by textual analysis:

1. an unstable field of the sensuous body: opening the possibility for change;
2. a multiplicity of the political body: legitimating the inappropriate/marginalized otherness;
3. the sexual *differance* in the body politic: the in-between identity.

In the following text reading, some paragraphs or individual stories will be excerpted for expanding interpretation in a deconstructive strategy; moreover, I will try to explain how things can be otherwise, and show how I justify the interpretation.

An Unstable Field of the Sensuous Body: Opening the Possibility for Change

As a girl I loved making Christmas ornaments and dyeing Easter eggs, all crafts I guess. I really enjoyed working with my hands. I had fantasies of some type of small cottage industry, not really a big career woman, but having meaningful work with a husband who was the breadwinner. As I got older I played the flute, mostly jazz. That suited my parents fine. They never steered me in the direction of a profession. They
sort of hoped I would have a traditional marriage and be the woman behind the great man. As such, they never got around to telling me that one day, when I got out of school, I was gonna have to support myself. And somehow I never got around to thinking about that while I was in college, where I studied archeology, English, and anthropology. I didn't want to be forced into taking a lot of prerequisites, so I designed my own college major and took only the classes I wanted to take.

When I graduated from college in seventy-five, I got part-time secretarial job at Bard College. Since I didn't like secretarial work, I started looking into the possibilities of repairing woodwind instruments. A professor in school had told me that I was good in music and good with my hands, so I should look into this. I took a short, four-week course at one of the colleges and discovered I liked doing mechanical work and set up an apprenticeship with a man in Kingston, New York. I would take the clarinets home and work on them . . . (AC, p. 34-35)

Based on the above paragraphs, Elaine Canfield's sensuous body in mechanical work opens up the possible otherwise for her to change her bodily experience from a secretary to a carpenter. From a deconstructive strategy, we see the dualisms of traditional work/non-traditional work, fantasy/reality, marriage/single, and dependent/independent. Since culture defines a woman doing specific jobs to maintain the cultural rule of sex segregation, Elaine's mechanical, single, and independent bodily experience has to be seen
as otherness to a culturally defined woman. The traditional culture told her to be a woman behind the great man and work with a husband who was the bread winner. However, what she did in reality is opposite to this traditional ideology. Her bodily experience showed autonomy and independence by which she determined what she wanted to do. She is dancing in-between being a woman's identity and doing a culturally called man's job.

Her enjoying mechanic work shows possible otherwise for a woman to challenge not only mainly men's non-traditional jobs but also traditional culturally defined women. From her words, we might see:

- **fantasies:** a husband, the breadwinner, a traditional marriage, and the great man
- **reality:** single; dislike secretarial work; like mechanical work
- **autonomy:** dislike to be forced; design by herself; do what she wanted
- **her body:** enjoy working with her hands; good in music; good at mechanical work

Her autonomy of doing what she wanted makes her escape from a docile body of traditional culture. As a docile body, she had to be forced and constructed by traditional culture, and do what culture told her to do, not what she wanted to do. However, her body rejected to be docile but enjoyed being otherwise. Indeed, the body is a field of sensation in which we make sense by perceiving things. Her hands enjoyed touching mechanic work, not traditional
secretarial work. In other words, her tactile perception was the key to being toward the mechanic world. Her body was sensuously and consciously living in math and mechanics, perceiving and moving by which she might identify herself. As Pilotta (1996) describes, "I am conscious of my body's sensitivity to my sense organs and their mobilizing effect. This consciousness is the recognition of myself in this body; i.e., I recognize as mine different parts of this body which make up the ego-identity that is maintained across an interconnected sequence of conscious states" (p. 83). Her ego-identity is not what traditional culture calls a woman, but something otherwise. In other words, the female phenomenal/sensuous/communicative body can open the possibility to change the corporeal experience of being-to-the-world. Not being a culturally docile body could be seen as a deconstructive practice to disrupt the traditional system of gender identity. Moreover, the bodily sensibility is the basic movement to deconstruct the conventional culture.

Open the Possibility

When gender dualism marks a demarcation in job segregation, the female bodily experience in technoscience may blur the boundary and open the possibility to challenge the traditional ideology of job segregation. Since women working in technoscience have been seen as the inappropriate other in sexual dualism, the female tactile experience with machines, tools and experimental materials may challenge the stable frozen system of sexual dualism. In other words, it is tactile perception as a source of deconstruction that can destabilize the system of dualism.
Case 1:

Holly came from a family which could not afford a college education for all the children; only the boys' education was supported. She described, "Somehow money was found for my brothers, which I didn't even resent at the time. That's the way it was in those days" (WSS, p. 94) She immigrated to the United States in the late 1960s and became a housewife and mother. One day Holly read in *Time* magazine about some woman who was at that time in her late thirties or her early forties with a seventeen-year-old child, and went back to university. And that story changed Holly's life since she thought she never had possibility to go back college education. "And that's the first time it occurred to me that such a thing was possible . . . And that really opened the door for me" (ibid., p. 95). Although Holly's family and ex-husband strongly opposed that idea, her eager pursuit of scientific study drove her desperately to go back to university so that her marriage broke up. Going to graduate school "did mean leaving my husband and my family" (ibid.). "My mother thought I was crazy. My brothers and sisters were amused at this middle-aged person's doing all this stuff. My husband was hostile. My children were very suffering. The other housewives that I knew where I lived were very disapproving. So I was really pretty much on my own" (ibid., p. 96). "For several years, I didn't have any money, and I was living in a slum. It was pretty rough. But I enjoyed the university. It was fine, and I got a whole lot of support" (ibid.). After her postdoctoral fellowship, Holly worked for a major company doing scientific technical work.
From the above story, going back to university and studying in science open the door for her to be possible otherwise. Being a housewife and mother is traditional culturally defined a woman's job. Motherhood has been seen as priority for being a woman in traditional culture. However, Holly's sense and perception in science opened the door for her to make her scientific bodily experience possible. Her sensuous body became a powerful field to transform her from a housewife to a scientist. In a deconstructive practice, we see the dualisms of boy/girl, family/career, marriage/divorce, and housewife-mother/Scientist. The first terms in these binary oppositions show central and privileged positions in a cultural mechanism; the second terms seem inappropriate and marginalized for a culturally defined woman. In Holly's story, she as the opposite side of other subverts the hierarchy of the privileged side. She concluded, "[h]earing about the women's movement and the realization that there were other possible careers beside mommy was very liberating" (WSS, p. 95). The possible otherwise is a liberating way for a woman to challenge the traditional ideology of being a woman.

Deconstruction as a mechanism provides a way to rethink the impossible as the possible. Holly as a girl never resented that the educational support went to the boys because culture told her that it was natural and she never doubted it until a female role model appeared. The thing—a married woman with kids going back to university—that she thought impossible became possible. The body/girl differences somehow come from cultural treatments; it
seems not natural, but political. In this context, her body tried to escape the panoptic power of culture and reject being a docile one-a woman under a hierarchical mechanism of sex dualism.

Her sensibility in scientific research broke the conventional conception of being a woman. In other words, what made the impossible become possible is her bodily sensuous communication with science.

Case 2:

Amy Kelley talked about how she could become a machinist in an aircraft industry. Her husband used to be a machine operator at a big machine shop and supported Amy to learn a non-traditional skill. "At first, during all this time I had known him, we discussed what he was doing at work. I found it fascinating . . . When I finally thought about machine shop work, I liked the money, and I always wanted to do something different. And then, of course, I like working with my hands. But I thought that maybe I might not be smart enough . . . My husband suggested I take some training courses . . . I'd only taken the precision part of it, learning how to use the instruments and stuff. My husband was working in the aircraft industry, and by then they were looking for women and minorities with non-traditional skills . . ." (AC, p. 120-121).

From the above story, Amy was dancing in-between a wife and a machinist, a traditional role and non-traditional role. In a play of differance, she, being a woman, is not a wife like culturally defined housewife; she is also not a machinist like a culturally legitimated
men's job. She is not either a wife or a machinist, but rather a wife and a machinist.

Unlike Holly's story, Amy's husband supported her to go to non-traditional job. Trying to do something different opens the possibility for her to learn and work as a machinist. Her body is constructed by a multiplicity of forces: husband's support, economic reason, her interest in machine operation, the intention of doing something different, and the chance for women and minorities with non-traditional skills. Her body undoes the hierarchy of male dominance in the machinist job. Her bodily movement forms the corporeal relation with machine/tools by her external perception. The social change opens the opportunity for women and minorities to disrupt the system of phallocentrism in the process of signification.

Doing something results from bodily movements. The tactile surface is the most basic phenomenon to make a bodily communication with machines possible. Amy's "learning", "doing", and "knowing" has to involve her sensuous experience with machines which constructs her in-between identity—a traditional wife and a non-traditional machinist. In other words, her sensuous body is the center of her identification in technoscience.

Case 3:

Lydia Vasquez became a machine operator because she went to a machine shop for janitorial work. She didn't know that a machine operator, a male dominant work, could get higher wage until she had her raise. She got the job opportunity by asking one. "Most other machine shops have men for this kind of job . . . I mentioned to the
supervisor that the machines looked intriguing and if there was ever an opportunity I would like to run one... after that I was put to work running machines. Of course, I was under a supervisor, because I had no idea how to run a machine or what to do with it... I could see the raises were coming in quickly. At that point I realized there was more money in doing jobs that have been mainly men's work" (AC, p. 103-104).

In Lydia's story, her sensuous body was interested in running machines so that this mainly men's job could open the possible otherwise for her. At first, though she knew that a machine operator was a mainly men's job, being a woman seemed impossible to participate in. However, since social rules changed and opened the opportunity for women to work in non-traditional jobs, it became possible that she as a woman asked for a mainly men's job. Getting a raise, she realized that mainly men's jobs could be associated with higher wage. The economic effect-higher wage-shows the hierarchy of men's jobs in sex segregation. On the contrary, the economic reason could enforce women to disrupt the privileged system of mainly men's job and destabilize the rule of sex segregation.

Besides the economic reason, Lydia saw men's working with machines and felt interested in running them. Her "seeing" and "working" is elementary tactile sensation for her to open the possibility of being a machinist.

Case 4:

Kathy Baerney went back to a clerk's job because she decided she felt better giving her time and energy to her kids and her
husband, instead of a career which she really would have liked to pursue. She quit her telephone frameman job for family though this is the job which she really would like to pursue and be good at. "I feel a loss though. I really do. I feel bad that I'm not working with my hands 'cause I enjoyed that and was good at it. . . . I miss that physical part of it, the working with tools" (AC. p. 224-225).

Based on Kathy's words, she went back to a culturally called women's job for maintaining what culture called motherhood and family value. Her story shows a conflict between being a culturally defined woman and doing a culturally called men's job. She first danced in-between but finally stopped in a point of logocentrism. She went back to what culture told her to be a woman though she felt a loss. Feeling better for family, but feeling bad not to fulfill her career, her corporeal body had struggling forces between the ideological family value and her corporeal relation with machines. Again, we see the dualisms of tradition/non-tradition, and family/career. But stopping dancing in-between, she ended up in the hierarchical side of binary oppositions.

In the texts, most of women in non-traditional jobs have a transit bodily experience from traditional jobs to non-traditional ones; from a teacher to a shipwright (Irene Hull); from a librarian to a steel hauler (Mary Rathke); from a janitoress to a machine operator (Lydia Vasquez); from a nurse to a painter at the aircraft plant (Jo Ann Johnson); from restaurant work to being an electrician (Anna Brinkely); and so on. The female body as an unstable field in-between traditional and non-traditional, femininity and masculinity.
subjectivity and objectivity, emotion and rationality, invisible and visible, impossible and possible, can operate a play of the in-between. Indeed, some of these female sensuous bodies still struggle between career and family; some still dream of being a housewife or having a traditional female job, but others would like to put their career to be the priority. No matter how this body is supported or rejected by husband or family, no matter how this female body hates or likes working with women or men, no matter how this body is interested in working with technoscience or she does it for economic reasons, and no matter how this body enjoys or feels exhausted in the male dominant jobs, the female corporeal body in technoscience challenges gender dualism in job segregation and opens the possibility of the in-between. It is her tactile perception that creates and expands her movements toward a technoscientific world which culturally and ideologically doesn't allow the female body to involve. Intercorporeality

The female bodily sensibilities in technoscience is not only an intersubjective relationship but also intercorporeal relationship. The female corporeal existence in technoscience not only breaks up the myth of female inferiority in understanding technoscience but also disrupt the sex dualism in job segregation. At the level of experience, the female body reflects a move toward technoscience and liberalizes herself beyond gender dualism. In deconstruction, the female body undoes the hierarchy of masculine system in technoscience and displaces the privileged side of dualism. And, the most important strategy for women to work in a masculine world is
As Pilotta (1996) elaborates.

The very ability to grasp something in its sensuousness is founded upon the corporeal structure of existence. Bodily sensibilities are nourished by the very depths of existence. At the level of experience we are revealing a radical sensibility which is prior to the occlusion of normative scientific reflection. Humans must be aware of this grasp of totality at the experiential level for a sensuous science to be possible. For me to be conscious of the experience of the sensible, a reflective move is required . . . Reflection tied to concrete perception would reveal man as freedom in the sphere of human praxis. (p. 82)

Can women have freedom in the sphere of culturally privileged men's praxis? Indeed, the very depths of female existence presents a radical sensibility to challenge the male hegemonic culture in technoscience. The dual system of masculinity/femininity and machine/non-machine have been disrupted due to women's corporeal relation with machines, tools, science and technology. Women's awareness of the grasp of technoscience not only opens the experiential level for her sensibility but also challenges culturally privileged masculinity in association with technoscience. In this part, I will like to discuss the conflict of the intercorporeal relation between men and women from the texts. How does culture call some work a men's job? How do men and women differently reflect upon
the so-called men's jobs? How does the female body present her tactile sensation in mainly men's jobs?

Intersubjective communication results from mutual understanding of the thing from different subjective perspectives. In this sense, the most important matter is understanding of the thing that must be generated basically from bodily perception of things. As Pilotta (1996) explicates, human intersubjectivity, as a relationship of subject to subject, requires the added relationship of subject to thing. An understanding of the other person requires an understanding of the things and their perspectives . . . .

. . . The subject's view of him/herself as a "scientist" depends on the perspectives in terms of which he/she can interpret him/herself as a scientist. He/she looks at the world from the perspective of a specific science, as distinct from the specific sciences. What makes a person a scientist and what the scientist communicates about is the understanding of the thing from a particular perspective as an object of that science. It is not the system of communication of a specific science which permits us to utter the phrases "speaking chemically" or "speaking physically," but rather the thing viewed from a "chemical" or "physical" perspective. Hence, intersubjective foundations as such are not sufficient. A particular perspective of the world of things, as the subject of a particular science, is the necessary aspect in terms of which an intersubjective process of communication can occur. (p. 156-158)
Thus, intersubjectivity is based on intercorporeality which could be seen as a multiplicity of understandings due to the differences of subjective perspectives. In a dual sex system, there seems to be different understandings in an intercorporeal communication between women and men in technoscience. From our texts, we'll see what and how an intercorporeal relation is constructed and see how things can be otherwise when the female body confronts machines, tools and systematic material and knowledge.

Case 5:

Working in a shop, Beverly Brown recalled. "'Women just don't understand machinery.' I hear this over and over again as they tried to talk me out of going" (AC, p. 253).

Evelynn Hammonds, as a female scientist, told her story of being a graduate student in science: "I was going to lab and having a male lab partner who would set up the experiment. What we would usually do is set the experiment up, run the experiment, and get our data. They'd usually come in and set it up and want me to take notes. If I got in and I set it up, usually they would take it apart. and I would have to fight with some guy about 'Don't take it apart.' They just assumed I couldn't set it up correctly!" (Sands, 1993, p. 243).

In the above cases, women in the sex dualism of job segregation have been defined that she cannot understand machinery and cannot correctly set experiments up. In a deconstructive practice, the hierarchical side of dualism has to be exposed. In the cultural presumption, women are excluded in the
operation of machinery and scientific experiments. In other words, the culturally constructed concept of female incapacity in technoscience obstacles the female being toward technoscientific world. Female corporeal being and male being toward perceiving and understanding technoscience seem to present different perspectives because of cultural construction of sex dualism. Though the female body shows corporeal existence in technoscience, the hierarchical side of culture might still deny her understanding. To deconstruct the masculine culture of technoscience, the intercorporeal communication has to be established between different sexes.

Case 6:

Laura Pfandler talked about her experience working with male co-workers: "For a long time I wasn't allowed to do certain types of jobs. I had to fight for that. Some of the men would take the tools out of my hands. You see it is just very hard for them to work with me because they're really into proving their masculinity and being tough. And when a woman comes on a job that can work, get something done as fast and efficiently as well as they can, it really affects them. Somehow if a woman can do it, it ain't that masculine, not that tough" (AC, p. 20-21).

In Laura's experience, she rejected being a docile body in the traditional ideology of sex dualism which didn't allow women to do certain types of jobs. It is significant that fighting to have a corporeal experience toward tool world only shows in the female sensuous body because the intersubjective relationship between two
sexed bodies seems to have a difficult communication based on different perspectives. As Pilotta (1996) explains,

... intersubjectivity is possible in terms of the subject's capacity to take up the same position and perspective to the world of things in order to understand the other's self-interpretation in terms of this perspective. The criterion for interaction is based on the attunement to the sense of things which is intercorporeal. (p. 161)

The privileged sex in technoscience rejects the culturally defined inappropriate sex to have sense of technoscientific things because in masculinity/femininity dualism, technoscience has been seen as masculinity. Thus, the only way to solve the problem of intercorporeal communication between two sexes in technoscience is to break up the boundary of dualism by presenting bodily sensation. In a deconstructive strategy, it is said that sex/gender dualism limits the female corporeal experience and cannot explain her experience and self-interpretation in perceiving so-called masculine technoscientific world. However, the female bodily movement is the basic source of deconstruction to disrupt the traditional ideology of sexual difference.

Case 7:

Amy Kelley shared her working experience with male co-workers. She described that "they were afraid to let me go on the machine, because they were afraid of the fact that they didn't know whether I could handle it or not, so I feel like sometimes I suffered in that respect . . . I run all the large jobs on the machine. It's not
really hard. It's kind of funny to see a woman on this machine. You think, 'Oh, she's gotta work hard.' But it's not really that bad. I do work hard just to get it set up so I can actually get the job going. You do have to use brute strength, and I'm not afraid to ask somebody else for help if there's something I feel is beyond my capability" (AC, p.124).

In Amy's case, again, it shows that the intercorporeality between female bodily experience and male one somehow seems a cultural rupture due to the different perspectives. Though two sexed bodies perceive the same machines, they have different self-interpretations in the intercorporeal and intersubjective communication. The fact is that the female body can run the machines. However, the fact is too that the male co-workers are afraid of female workers handling tools and that female workers suffer under this inferior presumption. Both sexed bodies suffer in the cultural signification of sexual dualism.

What cannot be denied is that the job is done by the female bodily movement-the sensuous tactility. She run the large jobs on the machines. She worked hard to get machines set up. She got the job going. Her tactile perception with machines is the elementary being toward a machine world.

Case 8:

Barbara Shaman described her mechanic experience on tools: "Outside machinists are pretty much mechanics. On new construction you install a lot of machinery and precision fittings. In repair, you might repair, rebuild something, reinstall the line, a whole variety of

In the above texts, Barbara being a woman shows her possible otherwise working in a culturally defined men's job. She confidently described her mechanic work in different assignments and suggested using the right tools. Her corporeal being toward mechanic work concretely presents her as a tool woman. Her perceiving and understanding tools has been beyond conventional cultural category of women who has been defined as incapable and inappropriate in mechanic work. In other words, her bodily experience destabilizes the system of signification in sexual difference.

Her hands touched tools and machines confidently. Her tactility toward a machine world is the basic and concrete bodily identity which cannot be explained in a phallocentric culture.

Case 9:

Irene Hull enjoyed her shipwright work: "It was a fun job. You'd go in there with your tape measure and your cutting knife and cut the insulation to size. I was always proud of the fact that I did a very good job. . ." (AC, p. 43).

Kathy Baerney said that "I'm talking of things that you know nothing about. I mean, it's hard to explain to someone exactly what it is, because it's your own language and it doesn't mean anything" (AC, p. 218).

Working as an electrician, Anna Brinkely shared her experience. "That was real hard because at the time I was very
afraid of men. I was overwhelmed. I had nothing. I mean, I'm not afraid now, because I have a skill nobody can take from me" (AC, p. 192).

From the above texts, they being women are not women but outsiders of the culturally defined category women because they are doing something that conventional culture doesn't tell women to do. Sexual dualism cannot explain that the female body enjoys touching machines in non-traditional jobs which have been ideologically thought in men's hands. In a deconstructive practice, women enjoying working with machines, tools, science and technology destabilizes the ideological system of sexual dualism. The corporeal experience is her own perception, her self-interpretation, her language. Her sensuous body is not afraid at all in confrontation of masculine world because she has her own skill, her profession, her experience, her interpretation which cannot be explained in conventional sexual dualism. It is only beyond sexual dualism that the female bodily existence in phallocentric technoscience can be interpreted. The female tactility in technoscience is the fact that women have corporeal relation with machines, scientific research, and systematic knowledge; namely, the female tactility—the sense of things—is the basic source of deconstruct sexual dualism.

Indeed, intersubjectivity is not simply the relationship between subject and subject, but also subject and object. The intercorporeal experience is not simply to communicate with each other by understanding subject to things, but historical and cultural sedimentation has to be considered. As Pilotta (1996) asserts.
Intercorporeality is an anonymous background on which our individual gestures emerge and transmit a common signification; it's an historically accumulated process of sedimentation of acting and behaving. Each corporeal gesture has a depth of meaning which at the same time lends openness and ambiguity to each gesture. In general, it is a perceptual dimension constituting a ground for direct communication of meanings which is never complete and requires more meaning than the present situation requires. (p. 154-155)

Each corporeal gesture, perception to thing, has a depth of meaning which lends openness and ambiguity to each gesture. There is a historical accumulated process of sedimentation in the intercorporeal experience. The female gesture toward technoscience though shows openness for possibility to challenge culturally defined masculine world but presents ambiguity at the same time since her corporeal experiential sedimentation cannot be explained in a mainly men's sphere. This ambiguity may destabilize the system of signification in sexual difference because the conventional culture in sexual dualism doesn't allow the existence of the female corporeality in technoscience. It is only beyond sexual dualism that the female subjective existence can be interpreted. As Barbara Shaman concluded that,

I think, generally, a woman taking a non-traditional job is a threat, in the sense that it's taking away a job, and then there's also the myth that women don't need to work. There have also
been myths that women can't do the work and that's why they haven't been there. (AC, p. 170)

Indeed, there have been myths that women can't work in technoscience. But the female concrete tactile perception beyond the sexual dualism presents the female nature of doing mechanic, technical, and scientific work.

Sexual Ambiguity

Is it not true that on the whole "woman" has hitherto been most despised by woman herself? (Nietzsche, 1966, p. 183)

Nietzsche brought up this interesting question to challenge women. In fact, from some of the texts, we may see that some women gave up traditional jobs because they didn't like to work with women though they were women too. Some of them might enjoy working with male co-workers; however, they were despised by the male co-workers or even suffering working with men since they perceived and experienced in a mainly men's sphere. Many of them liked to see more women working in non-traditional professions so that they could support each other. However, some women claimed that they might not hire women if they were in a higher position. This is quite a dilemma for the female corporeal existence in technoscience. They are women, but they despise women or are despised by women. They seem to want more women to work with or to support, but sometimes they don't want women to work with since they despise them. How can she being a woman despise women being? What makes it happen? It seems not only one category woman that the texts talk about. There are some women
that the culturally defined category woman cannot include. The female body seems complicated and presents a multiplicity in corporeity. In other words, the category of "woman" seems not one but plural.

Case 10:

Mary Rathke complained working with women in an insurance office before she became a steel hauler. She said that "I went to work at a big insurance company and believe me, working with an office full of women is the most God-awful way to spend eight hours, especially if it's a closed office like if you don't have the public as a buffer. Women are so bitchy, they're cliquey; they go on and on and on about who's got the most paper clips-it's disgusting. I have never worked in such a horrible situation in all my life, and I never will again. I don't think" (AC, p. 7).

Kathy Baerney described what she thought about female and male co-workers in her workplace. "I liked working with the guys in the central office... In an office dominated by females, it's more of a revenge thing, where working with all guys it's more of a laugh and joke. It-doesn't-really-matter-type thing. They were just as picky and just as gossip, they're just people. But I've seen women take revenge and be nasty and vicious" (AC, p. 221).

In the above cases, they tried to be outsiders of the group women they criticized. They despised to be the women working in the offices since their interest was non-traditional work. They could not like to share an intercorporeal relation with women in traditional work though they were women too. When they criticized "women".
the category "women" seemed to exclude them. In other words, there seemed to be different groups of women in their descriptions. They, being female bodies, quit or disliked traditional jobs due to despising the same sex in the work place. The conventional cultural definition of women cannot explain their identity. This despising shows somehow ambiguity of sexual identity-they being women despise women. If they can be excluded by the group women they despised, who are they? Are they not women? Or, are they in a different group women? Their ambiguous identity challenges and destabilizes the cultural signification of sexual dualism. Moreover, this ambiguity results from their concrete sensuous perception in non-traditional jobs.

Case 11:

Barbara, as a female professor and a leader in her field of scientific research, said that "maybe I would have one or two graduate students who would be female, because there would be no way that a male would ever want to set foot in a female's lab. (WSS. p. 27)

Ann was a scientific professor too. Her attitude to the female students was: "Don't plan on being a woman in science. Do the best work you can do; be a scientist." Ann explained what she meant by women; she continued, "... some of the women graduate students, although they're very bright in their studies, as far as learning things, synthesizing it, and putting it on exams, just haven't been taught to work hard in the lab... Since my philosophy is, well, a woman shouldn't get anything just because she's a woman and she
should do it on the basis of her science or whatever her profession is, therefore I guess I'm not sympathetic toward women doing things as women" (WSS, p. 22-24).

In these texts, again, it shows somewhat ambiguity of self-identity because they being female scientists despised women students. It seems to say that when they were doing scientific work, they denied themselves being women. However, if they denied being women, who were they? Did they mean that scientists were no sex at all? Or, were they submitted themselves to the male dominant culture of science? If the scientific work doesn't fit for women, how can they being women become scientific professors? In Barbara's statement, she might consider to have female students, but she was afraid that in this male dominant culture, male students would not work with female ones. Her first concern was male students though she used to be a female scientific student. The female body was put in a dilemma when she was placed in a male dominant environment. This body denies herself as a culturally defined woman but shows her tactile experience in science. In the male dominant culture of technoscience, the female body presents an ambiguity of their corporeal meaning.

From Ann's explanation, women are bright but do not work hard in science. She suggested that women should not do things as women but as professional scientists; in other words, a woman working as a professional scientist is not a woman. In her opinion, it seems that women and scientists were conflict-both cannot be together or associated; however, the fact is that she was both a
scientist and a woman in one corporeal existence. Her denial of being a woman working in a scientific work, again, presents an ambiguous identity of her corporeal body.

Case 12:

Elaine Canfield told that some women could not communicate with her due to her non-traditional work. She said, "Off the job, people in general are threatened by the type of work I do. Even the women I meet for the first time just cannot put the picture together. They just sort of stand back and say, 'Oh, isn't that nice.' Then they change the conversation really fast. They can't relate to you. They don't know where to begin. They may be threatened. I'm not sure. So in a social sense, you usually just get the silent treatment. They don't want to ask you too much more. They usually let it go at that" (AC, p. 40).

From Elaine's experience, the silent intercorporeal communication might be based on not understanding the corporeal experience. Since the non-traditional work has been culturally and ideologically associated with masculinity or male dominance, the category women might be threatened in confrontation of female bodily experience in non-traditional profession. They could not put a woman and a culturally defined men's job related or associated because that was not what conventional culture told them. The silent treatment results from cultural normalization in which a culturally defined woman should not involve into a so-called masculine sphere. A woman working in a men's job could not be identified by the same sex in conventional sexual dualism. Women in non-traditional jobs
cannot find their identity and do not belong to the culturally defined
group women, but surely they don't belong to the male group either. 
However, they are still being women as a whole, but also being their
own individuals-workers in non-traditional jobs.

Case 13:

Unlike the above stories, in Angela Summer's story, women 
were cooperative, she described that her female co-workers would 
helped her when she had problem to finish some work. "I really 
liked the women I worked with. They were really neat" (AC, p. 54).

Laura Pfandler shared her experience: "When I worked in 
Seattle as a helper there were other women working in that area for 
the gas company, so there was some support. On the east side, at 
Totem Lake, where I went as a fitter, there were no other women. I 
got into therapy to work on building my self-confidence" (AC, p. 
24).

Diana Clarke, as a fire fighter, wanted to see other women on 
the fire line. "I want to see a woman who's walking around not just 
in a fire camp, but on the fire line. I've never seen her. And that 
really bothers me because I want to see her" (AC, p. 33).

Gail, as a laboratory technician, enjoyed working with female 
co-workers in her laboratory. "I found it easier to collaborate with 
women, and easier to share space with women because they were 
never as demanding as men and didn't expect so much from me" 
(WSS, p. 91).

Deborah, a scientific professor, considered a female science 
teacher in her senior year "probably just critical for my success
Moreover, Deborah recalled a visit to the laboratory of a friend's mother who was a part-time scientist: "... she was a woman who was a scientist, and maybe that had an effect. I think it certainly gave me the idea women are scientists. ..." (WSS, p. 38).

From the above descriptions, "neat," "support," "easier to collaborate," "easier to share," "not demanding," "not expecting so much from others," and "female scientist image" are intercorporeal experiences among women working in the same field. They seemed eager to seek their group and identity since their corporeal experience in technoscience could not be interpreted in the sexual dualism. Their seeking identity group shows that things can be otherwise-not group women in sexual dualism but others. They are certainly women, but not the women as culture defines; they are individuals at the same time too. In other words, they are women (whole) and machinists (part) as two sides of the same coin.

The previous discussion of women despising women shows the ambiguity of the female corporeal existence. In fact, they never criticize women's capability in their professional work, but their emotional field. When the female bodily being involves a mainly men's world and shows her confidence and capability, it really seems a threat to masculinity since an image of a masculine body has been socially and culturally presumed as an ideological fantasy about the capacities of corporeal experience in technoscience. As Gatens (1991) points out,
Man is the model and it is his body which is taken for the human body; his reason which is taken for reason; his morality which is formalized into a system of ethics.

... the modern body politic is based on an image of a masculine body which reflects fantasies about the value and capacities of that body. The effects of this image shows its contemporary influence in our social and political behaviour which continues as implicitly accord privilege to particular bodies and their concerns as they are reflected in our ways of speaking and in what we speak about...

This fantasy of the modern body politic, constituted by 'the word' of men united, is not appropriate to women, and others, who were specifically excluded from it. (p. 83-84)

The privilege of the image of a masculine body ideologically effects the cognition of the female corporeal existence as inferiority. Elizabeth, as a scientific research staff of a prestigious university, recalled: "When I first went to graduate school, I was very intimidated by the males... I somehow thought this was a superior sex, and it was only after a few years that I realized that they were not a superior sex, and I gained some self-confidence" (WSS, p. 48).

From a deconstructive perspective, "a superior sex" in sexual dualism has to be revealed as a privileged one which has frozen the play of sex/gender system and marginalizes the other sex(es). The female sensuous/corporeal existence in technoscience might open an intercorporeal dialogue to dance in a free play of non-hierarchical and non-stable system in sexual differences. Gatens (1991) suggests
that "[t]o recognize another body is to be open to dialogue, debate and engagement with the other's law, and the other's ethic" (p. 85).

In a deconstructive practice, instability in the system of signification in conventional sexual dualism is the way to open a dialogue for sexual differences engaging with technoscience. Moreover, the source of instability comes from the elementary tactile sensation of the bodily being. The female body in technoscience cannot find the identity in sexual dualism, but she is poli-centrically a woman (whole) and a worker (individual) in a masculine sphere as two sides of the same coin. Regarding poli-centric field of experience, we'll have advanced discussion in building a theory.

A Multiplicity of the Political Body: Legitimating the Inappropriate/Marginalized Otherness

... [T]hey think it's a man's job and a woman has no right out there. (Beverly Brown, AC, p. 257)

That was real hard because at the time I was very afraid of men. I was overwhelmed. I had nothing. I mean, I'm not afraid now, because I have a skill nobody can take from me. (Anna Brinkely, AC, p. 192)

Being toward culturally called the mainly men's world, the female body as the inappropriate and marginalized other in technoscience has been questioned her capability and possibility from the perspective of privileged masculine image. Is it a man's job? Why is it a man's job? What is a man's job? Has a woman no right out there? Why has a woman no right out there? What is a
woman's right? How can a legal right and a job be associated? For
the female rights discourse, Faith (1994) suggests that.

Rights discourse has been a logical channel through which to
resist unwarranted claims on the female body. However, as a
legal process, rights discourse invokes the contradiction of
using a privileged male system of power to challenge a
privileged male system of rights. (p. 60)

In Foucault's concept of power, we are never being outside of power
relation. In deconstruction, we are never outside of structure that
we deconstruct. The task of deconstruction is not to discard the
structure but reinscribe it in another way. Thus, the body is never
being outside of power structure. Moreover, the corporeal body is a
result of power relation, a production of power structure. Though
the body is a multiplicity of forces, "the result of suppression or
subordination of the multiple conflicting forces" (Grosz, 1994, p. 122),
the body can be not only a docile body in a culture but also a
resistant body from a privileged culture. When the female body has
a corporeal experience in technoscience, the know-how
skill/knowledge is a power in her corporeity, though cultural and
social mechanism may try to confuse and repress her to be
unthought in technoscience and tell her that she should not involve
being toward the so-called mainly men's world. However, indeed, no
one can take this corporeal experience from her; it is inside of her
corporeal existence; she is her corporeal existence. Her body is a
political organization, a multiplicity of power relations. Her being
toward technoscience attempts to escape from the traditional culture
of certainty and identity in sexual dualism. To seek politic otherwise, the female body intervenes and complicates the system of sexual dualism and plays as a multiplicity of marginalized minority, sexed otherness, and inappropriate pregnancy potential to resist and destabilize the hierarchical structure of privileged masculinity in technoscience.

**Power/Knowledge**

When Kathy Baerney claimed that "I'm talking of things that you know nothing about. I mean, it's hard to explain to someone exactly what it is, because it's your own language and it doesn't mean anything" (AC, p. 218), her corporeal understanding of mechanic and technical work shows a power of know-how. It is her corporeal perspective of understanding her professional skills, her own language. Her interpretation, perspective, and understanding may serve her needs of being to the world and enhance her capability of working in her profession. As Grosz (1994) points out, "the body necessarily generates and presumes interpretations, perspectives, partial and incomplete acquaintance, which serve its needs in the world and may enhance its capacity and hunger for life" (Grosz, 1994, p. 122). Deborah, a scientific professor, described that "I'm not afraid of competition, and I feel very aggressive about my subject matter" (WSS, p. 41). Her body is ready to compete in a privileged male system and is very aggressive about her perception and understanding of scientific study. Knowing as power results from bodily movement and concrete tactile perception. However, the privileged power structure of sexual dualism against female
corporeal existence in technoscience has been thought as center, nature, and dominance. In a deconstructive strategy, the central, natural and privileged side of dualism as a violent hierarchy has to be displaced and subverted. But the power to disrupt the violent hierarchy has to come from elementary and concrete tactile sensation which has been the basic source of knowing-how.

Case 14:

Laura Pfandler recalled that "there was a lot of talk about having to work for a woman, to take orders from a woman. Some of them came right out in saying I didn't know what I was doing. One guy said, 'You can't tell me 'cause you don't know what you're doing.' I was told they didn't wanna take orders from a woman" (AC, p. 23).

Diana Clarke shared her experience: "'Oh. no! It's a woman and she doesn't know what she's doing.' Fortunately, after about one day or a couple hours of just being around me they know I do know what I am doing and they lighten up a lot. I'll be glad when it's just accepted for women supervisors on the fire line" (AC, p. 32).

Jo Ann Johnson also said that "we were supposed to be given those tools, but the supervisor didn't want me to learn. The attitude was that women can't really do this" (AC, p. 146).

Marge Kirk had the same experience: "They don't expect a girl to know what she's doing . . . It seems they will always think women aren't quite as capable" (AC, p. 157).

Holly said that "sometimes, your opinion is discarded and people won't even listen to what you are saying because you are a woman. They assume women don't know anything" (WSS, p. 96).
Ann described that "(my advisor) looked at my schedule, and she said, 'you can't do that.' And I said, 'Well, why can't I do this?' and she said, 'You just can't take all that science, you just can't do that.' And I said, 'Why not?' She said, 'It's too hard'' (WSS. p. 17).

All the above texts show how conventional culture defines women in technoscience. Those "don't know" and "can't do" arguments result from their female bodily beings which are not allowed to present and represent in skillful, mechanic, and scientific work. This "don't know" and "can't do" presumption is nothing about "know" and "do", but comes from ideological and cultural significance of sex/gender dualism. It is nothing about "they can't", but about "they are." Some mechanical and technical skills and scientific knowledge have been ideologically defined as masculine fields so that it is not what women cannot do but what women cannot be. Indeed, the above statements of female inferiority in technoscience employ a violent hierarchy to despise female corporeity in technoscience.

Knowing and doing have to be based on corporeal experience, not cultural definition and construction. There is no subject being who can know and do without bodily movements and tactile experiences. Tactility as concrete bodily power destabilizes the certainty of cultural construction.

Case 15:

Arlene Tupper as a transit supervisor said that "it was a blow to their (men's) ego to have a woman tell them what to do. Some wouldn't talk to me, or if you told them to do something, they would
not respond at all, and there was no way you could make them do it" (AC, p. 209).

Michelle Sanborn mentioned one of male co-worker's response in her work place: "He wouldn't do it on my say-so... and I know it's because I'm a woman" (AC, p. 231).

From the above experiences, again, in the male dominant culture/sphere, men cannot take order from female co-workers not because female workers don't know the mechanical/technical skills or scientific knowledge, but because they are women. In sexual dualism, there are only two sexes that culture defines. In a hierarchical system, when one is central and privileged, the other will be inappropriate and marginalized. But things can be otherwise: when hierarchical one is displaced by the other, the system of signification will be destabilized. It may put the system in chaos since the process of signification cannot interpret the phenomenon. However the other still be doubted and questioned and even unthought in a hierarchical violent because cultural and historical sedimentation hardly presents the other competence and capability.

Case 16:

Deborah, a scientific professor, recalled her scientific interest in school: "I knew for sure because I was so ambitious and doing so well, boys didn't like me, but instead of shutting up and becoming withdrawn, I just kept doing it and felt miserable. The drive was stronger than the need for approval, so I just felt wretched all the time, but it didn't shut me up" (WSS, p. 38).
Sylvia Lange confidently described that "they respect my opinions and know that when I talk about something, it's because I know about it; I've lived it, and it's not like I'm faking it" (AC, p. 250).

Base on the above statements, the female corporeity in technoscience couldn't be shut up though the culture/environment is hostile against her and makes her feel miserable. The eager motivation of studying science in this body is stronger than the need for approval of male privileged and hierarchical culture. Indeed, as Pilotta and Mickunas (1990) point out, "corporeity is the basic communicative power: Corporeity is the power that reveals the meanings of the perceptual field . . . " (p. 78). The meaning of female perception, understanding and interpretation in technoscience has been revealed from a communicative power of knowing and doing in her corporeity. Her corporeal experience opens the possibility to undo and disrupt the conventional system. It is her corporeal experience which she knows about and lives with. As Grosz (1994) explains,

It is the body, both at an intraorganic or cellular level and as a total, integrated organism, an animal, that is active, the source and site for the will to power and the movement of active (as well as reactive) forces. Knowledge and power are, for Nietzsche, the results of the body's activity, its self-expansion and self-overcoming. (p. 122)

Though the female body confronts a violent hierarchy of sexual dualism, her corporeity is the source and site for the will to power
and the movement of active forces toward the technoscientific world. Her body might be a docile body constrained by hierarchy of masculine culture, but also could be a resistant power by which the signification of hierarchy can be undone. This corporeal knowledge/power is self-expansion and self-overcoming to the culturally privileged and centralized masculine world.

Minority

The female body as minority in a technoscientific field is a political existence to the mainly men's world. The equal rights and minority quota have been legitimated and opened a door for women to expand their corporeal experiences and present their capabilities in technoscientific work. The conventional culture of excluding women in technoscience as a bio-power attempts to control and maintain all the numbers of members in technoscience to one privileged and dominant sex. From Foucault's explanation, the bio-power has been seen as a technique of power for state in population control. Foucault (1978) indicates that.

This bio-power was without question an indispensable element in the development of capitalism; the latter would not have been possible without the controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes. But this was not all it required; it also needed the growth of both these factors, their reinforcement as well as their availability and docility. . . (p. 140-141)
The cultural association between technoscience and masculinity could be seen as bio-power in the development of privileged male system which would not be possible without controlled insertion of female bodies into the technoscientific profession. Indeed, this bio-power also needs cultural and ideological reinforcement as well as gendered availability and docility. Since cultural and historical sedimentation under a mechanism of bio-power cannot interpret the female corporeal existence in technoscience, the female body as minority otherwise destabilizes the certainty of masculinity in the technoscientific field under a system of bio-power.

Case 17:

Mary Rathke recalled how she got into a non-traditional job: "This was in nineteen seventy-four and I made the connection in my head. this was when equal rights was beginning to be talked about, and I knew that people with federal contracts had to start hiring minorities . . . They needed me as a minority . . . In general I was treated a lot nicer than the guys were . . . I know that one of the reasons I got easy jobs was to satisfy government quota" (AC, p. 8-10).

Irene Hull learnt the concept of equal rights from her father-in-law. "My father-in-law educated me. really. He corrected a lot of the miseducation that I got in college. From him I learned that women did have rights . . . " (AC, p. 44).

Jo Ann Johnson got her painter job at an aircraft plant because the plant had to meet their quota. "He had apparently heard something from headquarters about hiring women painters. I
believe I got the job because I'm a woman. They had to meet their quota" (AC, p. 145).

Mary Kirk shared the same experience. "Actually, they needed another woman on their list for minority quota and I came at the right time" (AC, p. 154).

Arlene Tupper described how she got hired as minority: "Well, I decided that I could do better, and then they passed the law that women and minorities had to be hired everywhere in Washington . . . When I went in and applied, they just almost kissed me and dragged me in the door. They were so happy to see me. They had to hire women, and no women were applying. It just amazed me" (AC, p. 206-207).

Barbara described that "at the time that I was a graduate student there simply weren't any women on the faculties, and so I had never expected to join a faculty . . . all of the sudden there was a lot of pressure for all universities to hire women . . . all of a sudden there were all sorts of places that were interested . . . I don't think I'd have a professional life if it hadn't been for the women's movement" (WSS, p. 27).

Christine, a scientific professor, also claimed that being a woman helped her get a job. "At that stage, being a woman may even have helped; it certainly didn't hinder my getting a job" (WSS, p. 33).

In the above stories, it shows nothing about capability again, but only about the legal issue of the number of the female body. On the one hand, minority quota opens a door for women legally involving technoscientific jobs though culture defines women as
inappropriate others; in other words, being the other sex helps women get non-traditional jobs under the legal protection. On the other, minority quota also presents and represents the bio-power of sexual dualism in which women have been seen as marginalized minority. The number of the other sex is only used to satisfy government quota; it somehow has not changed the ideology of female inferiority in technoscience so that some women may not be treated equally but only did some easier jobs. People hire women doing technoscientific jobs not because of trusting female competence but because of meeting their quota; namely, being a woman in technoscience seems a corporeal existence for the quota number. However, though the other sex as minority in non-traditional jobs is still constrained under the sexual dualism, equal right and minority quota can be a legal start for the female bodily experiences to intervene the privileged masculine system of technoscience.

Case 18:

Ann talked about her dilemma when she, the only female faculty in her department, could be hard to say no to balance the number of committees though she didn't want to be one of them. "I supposes the women's movement has made it easier, and I think sometimes it's made it harder, because in the beginning, when you're the only woman, and they need a woman to balance their committees and that sort of thing then you're the woman. You're there, and then it's hard to say no to that type of thing" (WSS, p. 24).

In Ann's case, minority may be something that a woman doesn't want to be. Women as minority in a technoscientific field
presents and represents the group of the other on the basis of sexual dualism. If one is not the central and privileged sex, one must be the other minority sex. In addition, since she is called minority, she has to be the one who could balance quota numbers though she may not like to be. However, she will never be the majority because the binary pair of majority/minority freezes the dynamic play of system. In a hierarchical structure, the majority is always seen as center, nature and privilege; on the opposite side, the minority is culturally ignored, repressed and marginalized. Though the female body as a political existence legally enters the masculine system of technoscience, she as minority hardly displaces the majority to undo the hierarchy and shows the opposite possible meaning. Thus, majority/minority dualism may maintain the culture of the privileged masculine dominance in technoscience which is not natural, but a technique of bio-power. In a deconstructive practice, majority/minority dualism has to be deconstructed so that the true meaning of balancing could be found.

**Gender/Power**

I wanted the job, but they had already picked out another guy in my area for the position. I couldn't figure out why. I was better qualified, had greater working abilities, and my knowledge was greater. . . Then I said, "Before I go, I want to ask you one question, and I promise you I will not take it any further. Just between you and me, is it because he's a man and I'm a woman?" He said, "Yes." (Linda Lanham, AC, p. 185)
Because he's a man and she's a woman, not because qualification, working abilities, and knowledge are considered, the sex/gendered body becomes the key point to present who is predominant in the technoscientific culture. The job is nothing about qualification, but about sexual dualism. In other words, sexual dualism is the criteria for qualification. The female body has been seen as inferiority in technoscience though she may be better qualified, and have greater working ability with specific knowledge. Being seen as marginalized and inappropriate existence in technoscience, her sexed body presents her corporeal experience and tactile sensation in the ideologically called masculine dominant culture. Her corporeal existence is used only to satisfy the number of minority quota, not to show her ability and develop her potential. As Bordo (1992) points out, the corporeal body is a powerful symbolic form, a surface on which the central rules, hierarchies, and even metaphysical commitments of a culture are inscribed and thus reinforced through the concrete language of the body . . . The body is not only a text of culture. It is also . . . a practical, direct locus of social control. (p. 13)

The female body in technoscience has to fight for her tactile experience with machines against the central rules, hierarchies, and the masculine culture which somehow form the practice of social control. Since the body is a multiplicity of conflicting forces, the gendered body is not only a docile body with cultural and historical inscriptions but also a resistant body with corporeal experience. Bordo continues that "I view our bodies as a site of struggle, where
we must work to keep our daily practices in the service of resistance to gender domination, not in the service of 'docility' and gender normalization" (ibid., p. 28). The female body in technoscience as a site of struggle has to fight for seeking the significance of corporeal existence beyond the normalization of sexual dualism and majority/minority dualism. Faith (1994) also claims the female body as a strategic site of power and resistance which "is not static, monolithic or chronological; there is no one resistance, but rather infinite multiplicities of strategic resistances" (p. 57). The body is a political organization in which there is no static or monolithic power but multiplicities of power relations. The resistance of the body "is not to overturn one system of dominance for another, but rather to deconstruct power relations by transforming or reconstructing social values and institutions" (ibid., p. 47). Thus, the female corporeity in technoscience is not to overturn one sex dominant system for the other sex meaning, but rather to deconstruct the power relations in ideological sex/gender dualism by transforming or reinscribing social and cultural structures and values.

Most of the texts in our stories have mentioned the difficult environment that women faced in technoscientific work. The unfriendly, uncomfortable, nonsupportive and hostile culture/environments result from different values in gender power relations. In other words, the female corporeal existence in technoscience has to seek the strategies for survival and resources for resistance to transform and reconstruct cultural otherwise. Indeed, as we discussed previously, the female bodily movements
and tactility as a deconstructive source challenge the conventional culture and provide the meaning of possible otherwise in technoscience.

Case 19: nonsupportive culture

Florence described the situation of female professors in her scientific study. "It is very difficult to go on [this science] because you will find a lot of prejudice against women . . . I have certainly seen and been in a general sense subject to sort of macho sexism, but not in the way that has had any significant effect on my career, partly because I could always talk back smarter than they did" (WSS, p. 84).

Elizabeth recalled the nonsupportive environment for female students when she pursued her graduate study. "It was expected that women do not stay on in research science. . . when I went in, I was not awarded the fellowship . . . I was told a year or two later that it was because it was thought it would be wasted money because women, in fact, do not go on to have a career in science" (WSS, p. 45).

Barbara talked about her job interview experience. "The person that I really wanted to work with basically told me that he didn't take women, and what would I do if I got married and had children. And it was such a disillusioning interview that I went to my second choice . . ." (WSS, p. 27).

Jane said that "I don't think you can minimize that struggle between career and family for young women. You get to that point, and you look for role models of where it's been done successfully.
and they are just so darn few. In stead of role models, what you see are negative examples" (WSS, p. 111).

From the above statements, conventional culture doesn’t expect women having a career in technoscience but attempts to constrain them in family values. It is cultural prejudice against women to work in technoscience. The culturally defined female body, a body with pregnant potential, has been expected focusing on motherhood and family sphere so that funding for female students in sciences has been thought as wasting money; namely, women seem not worthy to support and encourage to work in technoscience under a traditional culture. This mechanism of repressing women to be forgotten and unthought in technoscience is the process of signification to construct and maintain the frozen system of the masculinity in association with technoscience. It is this traditional criteria of certainty and identity that women try to escape from in a deconstructive practice.

It is significant that sexual dualism employs a privileged system to legitimate masculinity as dominance and superiority and femininity as subordination and inferiority. Female corporeity to the technoscientific world seems inappropriate experience inscribed under a masculine ideology; especially, the idea of association between the pregnant body and technoscientific work is hardly accepted in a dominant masculine world. Thus, the female body has to fight for corporeal existence in technoscience and try to resist from culturally defined women so as to destabilize and deconstruct the privileged hierarchical sex/gender system.
Foucault (1978) indicates that the existence of power relations "depends on a multiplicity of points of resistance" (p. 95). A undecidable and unstable relations of gender power might decentralize any possible hierarchical sex to be the dominant one. Foucault (1982) also point out that, 

... so as to bring to light power relations, locate their position, find out their point of application and the methods used. Rather than analyzing power from the point of view of its internal rationality, it consists of analyzing power relations through the antagonism of strategies... forms of resistance and attempts made to dissociate these relations. (p. 211) 

Though sexual dualism as a panoptic cultural system attempts to visibly and invisibly control gender power relations, the corporeal body is not only a docile body but also a resistant body which might dissociate the relations. In a deconstructive strategy, the power relations between sex/gender and technoscience has to be dissociated on the basis of female bodily experience and tactile sensation in technoscience.

Case 20: isolation

Laura Pfandler recalled her first impression in work place: "I had a lot of fears about being a woman with so many men. The scariest thing was the sense of being alone. It was real obvious to me, like the first or second day that I was there, that the men weren't overjoyed about my being there" (AC, 20).

Marge Kirk also talked about her fear of working around men:
"... it was all full of people-men-and they were all standing around, very much in charge of their world there. I just had a scary feeling about it" (AC, p. 154).

Deborah recalled the feeling of not belonging; "having the thought you didn't belong was not something that meant you didn't belong... And I really enunciated that insight in almost those words to myself many times as a graduate student, because I knew I had the feeling of not belonging, and I knew it was okay not to take that feeling seriously" (WSS, p. 40).

From the above stories, fear, scare, and feeling of not belonging present the isolation and alienation of the female body in the technoscientific work. The female body is supposed to be associated and affiliated with technoscience since she becomes one member of the group; however, due to the sexual difference, the female body feels isolated and alienated. Again, we see the dualisms of male/female, majority/minority and association/alienation in those texts. Being a woman in technoscience means being alone, not associated. Though women can have corporeal experiences in technoscience, they somehow cannot be associated with the majority due to the hierarchical system of dualism.

The sense of being alone is the result of intercorporeal relations between dual sexes. The female body can take the feeling of not belonging okay because her concrete tactility supports her to recognize herself, in fact, belonging to technoscientific field no matter how male co-workers may not admit. The female corporeity may not belong to a mainly men's sphere, but her bodily movement and
tactile perception indeed present her belonging to technoscientific work.

Case 21: ignoring

Teresa Selfe expressed her thought: "they feel you are entering into an area they have designated as their own... They never seemed comfortable with me being there. I was either an entertainment or ignored" (AC, p. 80). She continued: "A couple of the other men in the engine room refused to look at me or talk to me the whole time I was there. Actually the ignoring didn't bother me that much" (AC, p. 85).

Elizabeth complained about "an extremely nonsupportive atmosphere where people tend to be in cut-throat competition. And in particular, I would say that women who tend to be softer spoken than men usually get beat on more than the men do or maybe ignored more" (WSS, p. 45).

Laura Pfandler recalled her experience when facing customers. "Usually it's a man, but sometimes a woman-the customers will immediately got to the male helper to talk the situation over. The helper, he won't hold back. They just walk right in the door. When things like this keep happening, I just get more and more angry" (AC, p. 23).

From the above experiences, they being women are ignored by male co-workers/colleagues, and even male and female customers because sexual segregation of culture cannot explain their existence in technoscience. Ignoring female corporeal experience in technoscience is a common situation in which male co-workers or
colleagues treat women in non-traditional work. They try to ignore female existence to maintain the fantasy of privileged masculinity in association with technoscience.

While the female body moved into an area filled with men, the male co-workers refused to have bodily perceptions (looking and talking) with female co-workers. Men try to erase the fact of the female bodily existence in technoscience; however, the female body does exist in the technoscientific field. In other words, men try to ignore the female being in technoscience, but the female bodily being is concretely there.

Case 22: taking tools

Laura Pfandler fought for working with her tools. "For a long time I wasn't allowed to do certain types of jobs. I had to fight for that. Some of the men would take the tools out of my hands. You see it is just very hard for them to work with me because they're really into proving their masculinity and being tough. And when a woman comes on a job that can work, get something done as fast and efficiently, as well, as they can, it really affects them. Somehow if a woman can do it, it ain't that masculine, not that tough. (AC, p. 20-21)

Teresa Selfe had the same experience: "I would very often express irritation at them taking the tool out of my hands-almost to the point of sometimes taking the tool back and saying, "That's all you had to say," or "I can do that myself. I've done that before. I know how to do it. You don't have to show me. Let me do it myself." Some of them got angry to the point where they would not speak to
me for two or three days afterward. I didn't pay much attention to their reactions. (AC, p. 78)

Beth Gedney described that, "the men I worked with either had the attitude that 'In spite of that fact that she's a woman she does a good job, so she's okay,' or 'I don't care what she does, she's a woman and she's never gonna do the job.' What can you do? You can't change these guys. And actually I ran into more trouble with people who were trying to be helpful. You know, 'She's such a frail, little thing, she can't lift that so I'll do it for her.' I swear I spent more time telling somebody to get out of the way and let me do it myself" (AC, p. 239).

Anna Brinkley said that, "Just the fact that people don't have give you the hard jobs, is a form of discrimination. They give you the things that they think you can handle, which means that you fall into that and don't learn . . . Deciding when to accept this and when to fight it is real difficult" (AC, p. 198).

Barbara said that "if you're of the opposite sex . . . you have to be fiercely independent" (WSS, p. 29-30).

From the above cases, indeed, it is a form of sexual discrimination since women are presumed not to be capable doing jobs. Men's taking tools out of women's hands as a power relation renounces not only that masculinity is the hierarchical position of using tools, but also that women are assumed as inappropriate sex to handle tools. The cultural dualisms of masculinity/femininity, superiority/inferiority, and independency/dependency constrain the intercorporeal understanding of sexual differences. However, when
the inappropriate sex takes the tool back and do things by herself. It shows that bodily movements and tactile perception reverse the hierarchical side of dualism. It might be a threat for masculinity because this reversal power relation operated from female bodily experiences is hardly explained in the dominant masculine world. In other words, the female corporeal experience based on elementary concrete tactility in technoscience could destabilize the certainty in the system of sexual dualism.

In addition, female bodily independency may also present a reversal form to disrupt the system of signification in sexual difference since femininity has been seen as dependence in cultural inscription of gender relation. As French (1994) asserts.

Power is a fragile dynamic interaction. The patriarchal system placed some responsibilities upon men, rewarding them by creating legal structures that forced women into economic, physical and political dependency on men-something they would not have had to do . . . The only way men can free themselves of fear and hate and an unhappy relation to others is to admit that they are not in control and in fact do not need to be in control to be men. (p. 32-33)

The independency/dependency dualism is ideologically articulated with sexual difference so as to construct a power relation between dual sexes. However, in the difference discourse, it has been said that there is no sexual difference at all but only one sex in control of all differences. The female corporeity in technoscience presents her
independency as an oppositional power and possible otherwise in sexual differences.

Case 23: survival

When Diana Clarke became a supervisor, her male co-workers resented that a whole lot. She described that, "trying to deal with men's fragile egos is something I have a very difficult time with. But I guess you have to deal with men as they exist and I'm not going to win any rounds by being impatient, so I try to be calm, stay cool about it" (AC, p. 33).

Elaine Canfield suggested that women have to learn professional survival skills to deal with men's masculinity. "For a woman to survive in the trades, you really have to know how to psych out men, know what's behind their thinking, why they react, why they're prejudiced, be somewhat sympathetic, yet stand your own ground. You have to be tactful, not be hostile, not alienate people. You really have to learn professional survival skills, because men's masculinity is threatened by you being there" (AC, p. 38).

Amy Kelley described that male co-workers "feel uncomfortable with the fact that a woman has any self-confidence at all. They feel like it's a threat" (AC, p. 125).

Marge Kirk said that "it takes a lot of energy just to stand your ground-balancing male egos with your right to survive" (AC, p. 156).

Florence recalled that "it is clear to me that are difficulties, and there are certainly prejudiced men. However. I find it is easier, and I think one is more effective, if one finds a nice, joking way of conveying that rather than being hostile" (WSS, p. 84-85).
In the above texts, to be patient, to be calm, stay cool, to be sympathetic, to be tactful, not to be hostile, and not to alienate people may be the strategies for survival when the female body confronts men's masculinity in the work place. Since technoscience has been defined as a privileged masculine world in a cultural and ideological inscription, men's masculinity somehow is threatened by female corporeal experience in technoscience. However, the threat is not that women can involve the culturally defined masculine technoscience, but that hierarchical meaning of masculinity cannot explain how the other sex can handle the culturally defined masculine jobs. The female corporeal existence in technoscience may threaten men's masculinity as well as the hierarchical system of sexual dualism. The intercorporeal relation between two opposite sexes has to be established on the basis of individual bodily movements and tactile perception in professions, not on the conventional ideology of sexual difference.

Case 24: anger

Laura Sarvis showed her anger with the promotion of nonqualified man. "I was showing him how to do different stuff, and he said they were thinking about making him supervisor on the bench at night. I looked at him, and I go, 'Have you ever worked on the bench before?' He said, 'No.' And I was pissed, because if anybody's gonna be supervisor it's gonna be my girl friend, Sue, or me, because we have seniority. Talk about a primo example of male chauvinism" (AC, p. 180).
Evelynn Hammonds, a scientist in physics, also felt depressed about the male dominant culture. She expressed that "it was very subtle. I think the sexual, the male/female issues were probably stronger then . . . It made it hard for me to tolerate what I saw around me. It made it hard for me to tolerate the way I saw women treated . . . And there were real disheartening. . . . The culture of physics was beginning to bother me a lot when I saw what was happening" (Sands, 1993, p. 245).

Teresa Selfe also showed her frustration about gender relation in her work place. She concluded: "I have a very deep sense of sadness at the human condition, the way humans treat each other, the way men are, and how possibly unchangeable that situation is out there. . . . it's an extremely male-dominated environment. The men bring out and reinforce in each other these same male values, male attitudes, male emotional responses, male treatment of each other. They're just reinforcing it, and they're only got women there because they're getting tax breaks and have to do it" (AC, p. 90).

The above statements show the conflicting power relations between two sexed bodies in technoscientific work since the female body has to fight in many intercorporeal situations. The unchangeable situation upsets the opposite sex and freezes the play of sexual differences. Though the female body shows her know-how skills and knowledge, her qualification may not be considered for a higher position because of her gender, the inappropriate opposite sex in a technoscientific field. It is true that job positions are somehow constrained by sexual dualism without considering professional
bodily experiences. In fact, it is only turn to the bodily sensation that the nature of sexual differences can be found. Thus, in order to undo the hierarchy of male dominance, the female body as a political body from fear to independence and from anger to fight may operate reversal forces to destabilize power relations and to decentralize privileged masculinity in technoscientific culture.

Case 25:

There are some stories which show less conflict between two sexed bodies working together in non-traditional jobs.

Diana Clarke thought that her crew were proud of her doing well. "The thing that is funny is that when they are forced to hire women, some of them want to do all the things for them that they were afraid they were going to have to do. They want to carry your hand tool or they take a little extra care of you. It's difficult for both sides. You have to say, 'Thank you, I appreciate it, but I can do it for myself.' My crew boss and crew did not resent my being a woman. I think they were kind of proud of it" (AC, p. 31).

Elaine Canfield enjoyed working with the male crew. "The crew I'm working with now-it's never been better. I'm accepted. They kid me like one of the guys. They pay me compliments. They treat me like an equal. It has been a real breakthrough. I've had other crews that have been really nice, but I know enough now so that I can talk business as well as pleasure. Not only am I compatible, but I feel they recognize me as a fairly good carpenter. I haven't had that recognition before" (AC, p. 39).
Lydia Vasquez had no fears at all working with male co-workers. "The men did not seem to have anything against seeing a woman running a machine there. They were so willing to help me do things, make a set-up, bring parts, or whatever, that I had no fears at all. If somebody was willing to teach me, I was willing to learn" (AC. p. 104).

In those cases, the female corporeity in non-traditional jobs is accepted. The binary oppositions of masculinity/femininity, superiority/inferiority, and dominance/subordination may dance in a play of in-between since culture undoes the hierarchy of masculinity in technoscience. A woman running a machine as a bodily movement and tactile perception constructs the intercorporeal relation between dual sexes. Indeed, dynamic gender power relations depend on a multiplicity of conflicting forces. As Foucault (1978) asserts, "where there is power, there is resistance, and yet, or rather consequently, this resistance is never in a position of exteriority in relation to power" (p. 95). A deconstructive practice can never be operated outside of power structure; non-hierarchical possibility of gender power can never occur outside of system of sexual differences. In other words, unstable and undecidable gender relations based on concrete bodily sensation and tactile perception in technoscientific culture as a deconstructive source open the possibility to decentralize the hegemonic power of one hierarchical sex.

The Body with a Womb

There is only one sexed body with a womb; however, this implication of pregnancy potential usually becomes an obstacle for
women to get a job. Since technoscientific work is culturally constructed by a masculine value system, a masculine body without a womb becomes ideologically superior and privileged; on the contrary, the body with a womb as the inappropriate other is excluded and unaccepted in culturally defined men's jobs. However, when the female corporeal existence in technoscience opens up the possible otherwise for transforming the ideological sex/gender dualism, the pregnancy potential as a reversal force may intervene gender power relations and disrupt the hierarchical masculine system.

Case 26:

Amy Kelley felt tired of hearing the questions about marriage and pregnancy when she faced an job interview. She recalled that: "The main concern was whether I was going to get married and get pregnant, and I got so tired of hearing it . . . Was I going to be there the whole four years or was I going to get pregnant? I would have liked to answer it one way, but I just said, no. I wasn't going to, but I wish I'd told them that nobody has to get married to get pregnant any more. I must have been asked that question four times in my interview" (AC, p. 123).

Barbara had the same experience. "The person that I really wanted to work with basically told me that he didn't take women, and what would I do if I got married and had children" (WSS, p. 27).

In the above cases, marriage and pregnancy are the significant concerns for professional culture to hire a woman. To get married and have children, the body with a womb is ideologically seen as
nonqualification and incapability in a masculine hierarchy of sexual dualism. Under this masculine dominant structure, the body with a womb is suppressed as the inappropriate other; if this body expects involving a mainly men's world, she is assumed to follow the masculine rule and become non-pregnant too. It seems that the cultural rules of masculinity attempt to overwhelm the nature of the female body. In other words, the dominant masculine culture in technoscience might erase sexual/gender differences to maintain the privileged hierarchy.

Case 27:

However, pregnancy might open the possibility for changing rules. It might be a force to destabilize the privileged rules. Arlene Tupper recalled, "Things really started changing when the first driver got pregnant. She was one of the second or third women they hired. They had never had a pregnant bus driver and didn't know what to do with her. She was very outspoken and insisted that they do things... They put her in the office, finally, and let her work at driver's pay up until the baby was born. But she insisted that things change. She'd say, 'I'm not going to go to the bathroom in that men's bathroom.' She did a lot of good and got things changed" (AC, p. 209).

In Arlene's story, things can be otherwise. Since men have to hire women to satisfy minority quota, they have to face legal issue of pregnancy. The pregnant body as a political body though seems the inappropriate other, but this otherness has to be legitimated. The pregnant body could be the central and natural one to displace the
hierarchical master in technoscience and to change and transform the
privileged structure.

Indeed, the privileged hierarchy in power relations could be
destabilized while the body/subject is displaced continually. To
deconstruct the sexual dualism in technoscience is not based on any
one sex, but plural sexes. As Nietzsche (1967) points out the
multiplicity of power relations:

My idea is that every specific body strives to become master
over all space and to extend its force (-its will to power:) and to
thrust back all that resists its extension. But it continually
encounters similar efforts on the part of other bodies and ends
by coming to an arrangement ("union") with those of them that
are sufficiently related to it: thus they then conspire together
for power. (p. 340)

When men were forced to hire women, and when the female
corporeal experience in technoscience has been legitimated, the
masculine hierarchy of power relations has to be transformed. Every
sexed body strives to become master in a power relation: however,
one will continually encounter similar efforts from other sexed
bodies so that an unstable and undecidable power relation can be
constructed in a deconstructive practice. The political body as a
source of deconstruction could reverse the mastery position and open
the possible otherwise in a power relation.

The culturally defined body with inferior and incapable
knowledge, the other sex/gender, the inappropriate minority, and
the body with a womb have shown as other names of the female
body in technoscience. However, inferiority, incapability, the inappropriate/marginalized other, and pregnancy could open the possibilities to play as the central subject and destabilize power relations. As Blondel (1991) elaborates, "the body, as a unity and plurality, is the site of the interpretation that establishes the chaos of the world in plural units, or signs" (p. 214). Further, "the body is... a political organization based on relations between forces that are unstable and not univocally regulated by conscious causal logic: there is no submissive obedience or function that is harmoniously regulated by laws" (ibid., p. 232). "If there were continual stability, there were be no need politics" (Derrida, 1996, p. 84). The traditional hierarchy of masculine culture cannot be continually stable since the body/subject is not one but plural. The bodily movements always open the field of ambiguity and instability in confrontation of perceiving and understanding things. The female bodily experience in technoscience as a political existence opens the concrete and elementary otherwise for an unstable power relation in sexual dualism.

The Sexual Difference in the Body Politic: the In-Between Identity

I did not want to be a man, but I did not quite want to be a real woman either. (Griffiths, 1995, p. 23)

It's no sex at all. It doesn't matter if I'm a man or a woman. I'm a machinist. (Amy Kelley, AC, p. 130)

Who am I in technoscience? If I am neither a man nor a woman, who am I? Can I be no sex at all when I work in technoscience? Does a woman exist in technoscience? If
technoscience is phallocentric, who is a woman in this logocentrism? How is female subjectivity constructed in masculine dominant culture? If the body is a subject in which meaning is inscribed, constructed, and reconstructed, what meaning is inscribed in a female body/subject in phallocentric technoscience? McLaren (1991) claims that "the body is conceived as the interface of the individual and society, as a site of embodied or 'enfleshed' subjectivity which also reflects the ideological sedimentations of the social structure inscribed into it" (p. 150). What ideological sedimentations of social structure does the female body reflect in technoscience? If the body is a site of embodied subjectivity, how can a female subjectivity be constructed in phallocentrism? What is a female identity in mainly men's culture of technoscience? What and how does a female body/subject identify in a phallocentric ideology? In the previous discussion, we show that the fact of the female corporeal existence in technoscience cannot be interpreted by the system of signification in sexual dualism. The female corporeity in technoscience disrupts and intervenes the traditional hierarchy of masculine culture. Moreover, we argue that the multiplicity of struggling forces in the female political body can destabilize and complicate the gender relations. However, what is gender/sexual difference in technoscience? Is there sexual difference in masculine culture of technoscience?

Derrida (1988) claims that sexual difference has been erased since masculinity was privileged in gendered culture. Spivak (1993) asserts that sexual identity is sexual differance, not sexual difference. There is only a play of differance which allows the very possibility of
differences. If who I am is a question of subjective identity, the construction and reconstruction of a true I can only present not in difference, but in differance.

In deconstruction, the subject is continually displaced so that there is no centralized meaning in context/culture. To deconstruct the subject, as Derrida explains,

... does not mean to deny its existence. There are subjects, 'operations' or 'effects' (effets) of subjectivity. This is an incontrovertible fact. To acknowledge this does not mean, however, that the subject is what it says it is. The subject is not some meta-linguistic substance or identity, some pur cogito of self-presence; it is always inscribed in language. My work does not, therefore, destroy the subject; it simply tries to resituate it. (Kearney, 1984, p. 125)

To continually displace the subject doesn't mean to deny the subject's existence. The subject does exist since the body/subject/I has corporeal experiences and produces meaning by perceiving things and space. However, what is the subjectivity of the female corporeal existence in technoscience? Who is a woman in phallocentrism? How does a woman in technoscience see herself, her sexual identity? Is she a woman in masculine technoscience? Is she a woman in a men's culture? Or, is she not a woman since technoscience is culturally and ideologically associated with masculinity?

Indeed, the phallocentric culture as an effective domain of communication can transform the bodily being into a culturally defined entity. It is a communication of an affectivity that has the
power to transform the corporeal beings and to make them into followers of specific rules/disciplines. As Pilotta and Mickunas (1990) explicate.

The effective domain of communication is the power of transformation, the capacity to "make" events occur, to make them present. . . The power of the ritualistic performance by the speaker, performing a ritualistic incantation, does not comprise a communication of a message but of an affectivity that has the power to transform the person and to make him into a "follower" of some would-be leader, star, cause, or purpose. Indeed, the individual becomes the very embodiment of the cause and is willing to sacrifice all for its fulfillment. (p. 139)

In phallocentrism, technoscientific culture could transform the individual subject to the embodiment of the masculine privilege to fulfill and maintain the conventional structure. In other words, phallocentric culture of technoscience as "the speaker 'becomes' the very embodiment of the destiny of the cause, becomes its power and purpose" (ibid., p. 139). Under this affectivity of communication, the female identity in masculine culture of technoscience becomes ambiguous. Since "the process of transformation requires an identification with an event, which is incantated in communication" (ibid., p. 143), the female bodily identification within a phallocentric culture of technoscience presents uncertain and eccentric.

Transforming the Self: The In-Between Identity
Identity is socially constructed; i.e., identity as social rules might be constructed to maintain a specific hegemonic structure. For scholars in cultural constructualism, identity as a cultural production produces the way by which people's thinking and experiences can be manipulated.

Identity is based on differences. It is to say that identity is constructed by bio-social differences. Since all human beings are different biologically and culturally, identity is seen as a process of differentiation. However, as the above argument, identification with something is a process of transformation—"one does not simply change one's mind; rather the entire being is transformed" (Pilotta and Mickunas, 1990, p. 143). In other words, if you identify yourself with a member of a specific group, you are not only different from other groups' members at the same time, but also perceptually transformed to someone else. Thus, identity might not be natural, but political in a cultural discourse. Identification as a powerful process of individual perceptual transformation may construct a group meaning (a social body) as well as a self meaning (an individual being) in the system of signification.

Case 28: Griffiths' story

The following is Griffiths' story about how she resituated her identity when she discovered her interest in technoscience. She now is a professor in science education. First, she wrote:

My problem stemmed from a personal need to do with my construction of self. I wanted to belong to an abstract grouping: real women. (Griffiths, 1995, p. 22)
From the above paragraph, who are real women? Our understanding ourselves cannot be apart from the cultural organization of gender that produces us. The culture always summons the subject into its meaning system. Barthes' (1972) notion of interpellant speech of myth may explain how the body/subject can be constructed in a process of signification. Culture/history/things/space as a powerful interpellation is turned towards me; and I am subjected to its intentional force; it summons me to receive its expansive ambiguity. In other words, the construction of subjectivity is intimately related to the environment, society, and culture outside of the body. She is bio-socially and culturally called a woman. From her statement, she wants to identify herself with a real woman which is culture tells her who she is. Namely, the conventional culture attempts to transform herself into a real woman—a desired entity. "This identity, this identification with others, this becoming the other, is still powerfully present" in our perceptual cultures. The bodily being is "in the power of what is being communicated" (Pilotta and Mickunas, 1990, p. 143). In Griffiths' story, she continued:

The problem went on worrying me until the end of my teens, when I eventually resolved it (illogically enough!) by deciding that I must be a real woman because I liked and wanted babies. (In fact, in retrospect, I do not think I particularly liked them.) I also decided that there were real innate sex differences, which showed themselves in personality, and the attitude to babies was the key. This resolution of the issue
allowed me to go on being myself even if that meant accepting that I possessed a number of apparently masculine attributes. I reasoned that these attributes must be unimportant so far as distinguishing the sexes was concerned, because I had them, and I was a real woman. No wonder I resisted feminism whenever it forced itself on my attention. Its critical questions about sex differences would have threatened the fragile edifice I had constructed. (ibid., p. 22)

From her words, being a real woman as a process of identification has meant to present her motherhood-to like and want babies-a perceptual transformation. Since she wanted to identify with a real woman, she had to be transformed to like and want babies though she might not really like them. Butler (1991) critiques the politics of identification as an instrument of normalization. She explicates that "identity categories tend to be instrument of regulatory regimes, whether as the normalizing categories of oppressive structures or as the rallying points for a liberatory contestation of that very oppression" (p. 13-14). Griffiths tried herself to fit the category of real women and to follow the rules of normalization. However, there were conflicting forces in her body in which she found that being herself had to include some culturally called masculine attributes that were not social rules of normalization for a real woman. It is the system of masculinity/femininity dualism that cannot explain her dual binary attributes in one body. Under the cultural normalization of sexual difference, she was afraid of being an outsider of the category
woman. She denied feminist radical critiques of sexual differences which might threaten her identity that cultural summoned and told her to construct. As Pilotta and Michunas (1990) point out, "through the power of the spoken word, the person is brought to the identity of what is being advertised or incantated, and in this identity he is transformed" (p. 143). The powerful culture of sexual dualism brings her into the identity of what is being incantated—a culturally constructed woman, and in this identity she has to be transformed into a real woman.

The whole question raised itself again, years later, at a series of feminist conferences called Girls and Science and Technology (GASAT). No doubt my past anxieties and their resolution contributed to my sharp rejection of the ideas being floated that girls and women were less abstract, less linearly logical and had a characteristic female logic (and it would be much better for science and the future of the world if more scientists were women with their special characteristics). My argument was that such a characterisation of women meant that I could not be a woman, and this was plainly wrong. I was sure I belonged to the category 'woman,' and it would have to be drawn so as to include me. (ibid., p. 22)

In the cultural normalization, the category woman presents and represents a woman more abstract and linearly logic thinking without a characteristic female logic which opposed to Griffiths’ being herself. She attempted to reject being herself in order to belong to the category woman because she were frightened not to be a
culturally called woman. She wanted to be sure that she belonged to the category woman which had to include her since she thought she was one and had to be one. She insisted that she was one in the category woman, though she might not fit into the category. The culture of normalization as a communication of an affectivity has the power to transform the person and make her into a follower of real women. Indeed, "the individual becomes the very embodiment of the cause and is willing to sacrifice all for its fulfillment" (Pilotta and Michunas, 1990, p. 139). She was just afraid of not being a real woman so that she has to sacrifice herself for the fulfillment of being a real woman. If she is excluded being a culturally called woman, then, who was she? Who can she be? The conflict shows the ambiguity of sexual identity and the dilemma of being a woman. "I could not be a woman" is a serious doubt which may challenge the hierarchical certainty of conventional culture in sexual difference.

I have told this story as a project of belonging. It could also have been told as a rejection of belonging. After all, it would have been simpler for me not to specialise in sciences. I like English and history just as much as maths and physics. It would have been easier to learn to hide my intelligence and competence altogether, and there was plenty of peer pressure to do so. In fact, to say that I simply expanded and mystified the category 'woman' until it included me is too simple a story. (ibid., p. 22-23)

From Griffiths’ description, she being a woman liked science. How could a category woman be interested in science? Surely, she
could learn to hide her intelligence and competence in science so that she could still be included in the category woman and identify herself with a real woman. Her intelligence and competence in science seemed a conflict against her being a so-called real woman. However, why and how should she sacrifice herself and fulfill being a category woman who she might not be? The surface culturally inscribed body confronted the conflict with the real corporeal experience in technoscience. This struggle resulted from her interest in science. Nietzsche (1966) teases out the women in science; he asks that "is it not in the very worst taste that woman thus sets herself up to be scientific?" (p. 183) It is phallocentric culture that tells the category woman that science is the very worst taste for her no matter how good and interested she is in science. The culture tells us that science conflicts with being a real woman because science has to be associated with masculinity. Masculinity, objectivity, and rationality as slogans politically incantated in technoscientific culture have the power to transform technoscience into otherwise unattainable. Since Griffiths could not be interested in science and being a real woman under the masculine culture of technoscience, she began to think rejection of belonging to the category woman and to rethink who she was.

In truth, I did not value or even like women very much. All my friends were men. I was proud of this fact. I remember feeling that if there were a lot of men in a meeting or gathering they validated it as valuable. I was pleased that I could do physics, because it must be hard and worthy if there were so
few girls doing it. On the other hand, I was a girl and I used to wonder if I had got into the course only because of being a girl on a quota. (ibid., p. 23)

Just as Nietzsche (1966) argues. "is it not true that on the whole 'woman' has hitherto been most despised by woman herself. . .?" (p. 183) However, Nietzsche just brings the question, but not to investigate the reason. The former woman in his argument can be seen as the category woman who may deny or hide herself to follow social and cultural normalization as a docile body; the latter woman can be the one who rejects to sacrifice herself for the fulfillment of being a real woman but presents and represents herself as who she is. Griffiths was proud of herself doing physics which the category woman was told not to do so. She seemed no more to insist on being a category woman since she did not value or even like to identify herself with the category women though she had thought that she was one. She also showed her dilemma in two sides of doing physics: on the one hand, she could really do physics; on the other, being a woman, her doing physics seemed only to satisfy the number of minority quota. Her doing physics is a perceptual transformation by her bodily movement and tactility. In other words, her rejection of being a real woman might be seen as a reversal identification due to her concrete tactile perception. Finally, she seriously claimed.

I did not want to be a man, but I did not quite want to be a real woman either. My actions all showed that my self-definition was of a self different from most women. I had heroes and a few heroines as role models. and a few female
friends. I was constructing a self that was a bit of an outsider that could grow and live in the spaces between the stereotypes. (ibid., p. 23)

In this paragraph, Griffiths no longer identified herself with a category woman, but surely not a man. She did not want to be either a woman or a man. The culture of sexual dualism cannot explain being neither a woman nor a man. What did she really want? Could she be just what she wanted to be beyond bio-social identification? Who could she be? Could she be someone otherwise beyond sexual dualism? From a category real woman to not wanting to be a real woman, it is a total rejection, a reversal identification for fulfillment of doing sciences. She transformed herself into an outsider of sexual dualism—neither a woman nor a man—because of her corporeal sensation in sciences. She wanted to identify with someone in-between the stereotypes. Moreover, being neither a woman nor a man destabilizes the certainty of sexual identity.

This self-construction had its analogues in one of the Girls and Science and Technology conferences too. I and a few others spent a very happy evening transgressing the assumptions of the Conferences by listing what we liked about technology—not just clean water and contraceptives, but also fast cars, brightly coloured powerful earth-moving equipment, and computer gee-whizzery. We belonged—we were feminist women actively contributing to a critique of science and technology—but we liked not quite belonging too. (ibid., p. 23)
Griffiths found her belonging group in which women loved science and technology that the category woman were constrained to do. They found themselves but tried to reject belonging. As many feminists suggest resistance to classification and identification, they attempted to escape from sexual binary structure. De Lauretis (1990) suggests the concepts of dislocation and disidentification: "in order to go on with the work of social and subjective transformation, in order to sustain the movement, it has to dis-locate itself, to dis-identify from those assumptions and conditions taken for granted" (p. 138). De Lauretis also puts an emphasis on deconstruction and reconstruction of identity. She continues that "to displace oneself from the system, to dis-locate, to disaffiliate, or disengage one's attention from it, is to experience a reorientation of attention. . . a feeling of disengagement and re-engagement of one's power as a perceiver" (ibid., p. 144). In Griffiths' story, her dislocation, disaffiliation and disengagement with the category woman open the possibilities for her to transform and reconstruct her identity. Her rejection of belonging does not mean to deny her existence but presents her identity in a play of the in-between. The term "we" is a belonging group though they liked not quite belonging. In fact, the "'we-consciousness' . . . is ultimately a poli-centric field of communication. A field that founds us, but also a field that is founded by the individuals . . . " (Pilotta and Michunas, 1990, p. 81). The poli-centric field of experience can be seen as a result of intercorporeal relationship by various individual tactile sensations. From a poli-centric perspective, the body/subject not only finds the
group identity but also develops the individual perceptual being. In other words, the individual poli-centrically exists in a social dialogical field as well as in various individual differences. The poli-centric field of experience might explain the condition of the female bodily existence in technoscience—women as a whole do exist with their own individual differences such as technoscientific interests.

Sexual Differance

Differance is neither a word, a concept nor an origin, neither presence nor absence. It may present undecidability and irreducibility. Difference is only possible through the play of differance which can never be defined in the system of binary opposition. As Derrida puts it.

The notion of 'differance' is a non-concept in that it cannot be defined in terms of oppositional predicates; it is neither this nor that; but rather this and that (e.g. the act of differing and of deferring) without being reducible to a dialectical logic either... the term 'differance' cannot be defined within a system of logic- Aristotelian or dialectical—that is, within the logocentric system of philosophy. (Kearney. 1984, p. 110)

Differance can never be defined in logocentrism because differance attempts to prevent any subject as a master in any structure. In logocentrism, there is only one hierarchical meaning so that differences have to be erased to maintain the authority of hegemony. Similarly, sexual differences cannot exist when phallocentrism is practiced in the system of signification. Thus, Derrida (1988) critiques culturally constructed sexual difference;
when sexual difference is determined by opposition in the dialectical sense . . . , one appears to set off "the war between the sexes": but one precipitates the end with victory going to the masculine sex. The determination of sexual difference in opposition is destined, designed, in truth, for truth; it is so in order to erase sexual difference. The dialectical opposition neutralizes or supersedes . . . the difference. (p. 175)

Therefore, women do not exist in traditional phallogocentric discourse though women do exist. Women are neither present nor absent, but rather present and absent. In a deconstructive interpretation, the female subjectivity may be found in a system of difference. The female bodily existence in technoscience is neither a woman nor a scientist, but rather a woman and a scientist. The technoscientific experience is only explained in a poli-centric concept that the female body/subject can exist. The bodily beings are not only workers in technoscience (a group identity beyond sexual dualism) but also their own individuals (sexual differences). In technoscientific culture under a system of sexual dualism, women are doing culturally and socially called men's work. If a woman does men's work, should she transform into a man to fulfill the job? Or, can she identify with a woman and do the job? Who is she in technoscience? The different individual bodily beings is poli-centrically articulated with and founds technoscientific field.

Case 29:

As a scientific professor, Ann said that "I obviously am a workaholic, and some of them (female students) don't want to be. So
my attitude is: Don't plan on being a woman in science. Do the best work you can do; be a scientist" (WSS, p. 22).

In Ann's case, it is significant that there is sexual ambiguity in her statement. She thought that being a woman and being a scientist were in a conflict situation; however, she was a woman as well as a scientist. Like Griffiths' rejection of belonging to the category women, Ann denied herself as one of women, but a scientist. She denied being a woman because she could not find herself in the category women in which conventional culture defined who a woman was. In other words, culturally defined category women cannot interpret her subjective identity—a female scientist. She being a woman denied herself being a woman; namely, there must be sexual otherwise for her identity.

Case 30:

When Evelyn Hammonds pursued her PhD study in physics, she was startled that women were rejected in a scientific culture. She recalled: "It just started coming out more and more that you couldn't be a serious scientist and a woman. That was a prevailing attitude in the department. I was startled. I was completely shocked. I had never had anybody, the Black students I had gone to school with, question whether or not I could do what I wanted to do. I expected opposition from white people, and I expected that to be because I was a Black person, but I never expected opposition because I was a woman. In my usual fashion I went to the library to find out about Black women in science and women scientists. ... and there was nothing! Then I started getting worried" (Sands, 1993, p.
Evelynn continued that "... the fact that again, what was happening in our personal lives was that more and more we were experiencing 'you can't be a woman and do this.' That pull from boyfriends, from male friends, was causing a lot of conflict." (ibid., p. 244).

Her identity with a woman was rejected by a phallocentric discourse of science which repeated that she couldn't be a scientist and a woman in one corporeity. She confronted the dilemma-she couldn't be a scientist if she was a woman; or she couldn't be a woman if she wanted to be a scientist. In other words, female scientists could not exist in phallocentric scientific culture. The hierarchical system of signification in sexual dualism cannot explain the existence of female scientists. In fact, the female corporeal existence in technoscience is in a poli-centric field of experiences-the various individuals are not only their own entity but also being within we-consciousness. In the experiential domain, the female bodily experience in technoscience is a poli-centric process of differentiation in the perceptual fields.

The female identity of her corporeal existence in technoscience is ambiguous in a phallocentric culture since there are the rules of normalization for women to perceive what culture tells them to do or not to do. There was a lot of conflict between being a woman under cultural normalization of sexual difference and Evelynn's being a female scientist. However, the female perceptual experience in technoscience is concrete and elementary differentiated from others in a poli-centric field of experiences.
Case 31:

When Nora Quealey decided to have a non-traditional job, her father suggested her that, "You can still be treated like a lady and act like a lady and work like a man" (AC, p. 92).

Similarly, Lydia Vasquez was told so by her male co-worker: "Another time that man told me, if I was going to do a man's job, then I had better look like a man" (AC, p. 106).

In the above cases, a woman in a non-traditional job seems to have to present herself as a woman and a man in one body. The question is how she can be two sexes in one body? Does it mean that she is an androgy? Since culture defines non-traditional work as a masculine job, should she be like a man if she can do the job? What is wrong with being a woman and doing the job? Being a woman, she is told to be like a man and do the job. Who can she be? A woman looks like a man? "You'd better look like a man," "you should work like a man," and "you can't be a woman and do this"—all are phallocentric statements. on the one hand; on the other, they try to summon women to follow the masculine rules in technoscience. In other words, a woman in technoscience can not be herself in the hierarchical system of sexual dualism. However, she can do the technoscientific work; her perceptual experience in technoscience is concrete; she is never being a male worker but differentiated from others in a poli-centric field of experiences.

Case 32:

Not only men but also women saw female workers in non-traditional jobs as men. Beverly Brown shared her experience: "I
haven't found anybody that fits into that area that I can talk with, you know, intimately, yet be accepted for what I do... And a lot of women don't see me as being feminine. They can't talk to me because of the work I do" (AC, p. 262).

In Beverly's story, it shows that there is only one voice under a phallocentric culture. No matter who you are—male or female, he and she tell only one story. There is no sexual difference in a phallocentric discourse. The category woman cannot accept women working in a culturally defined masculine field. The dualism of masculinity and femininity again cannot explain the existence of the female body in a masculine job. In a poli-centric field of experiences, "the individual experiences are extended by, and differentiated from, others and are mediated by the experiences imbedded in sign systems" (Pilotta and Michunas, 1990, p. 120). The female bodily experience in technoscience is differentiated from other category woman's or man's experiences and is mediated by experiences imbedded in different systems of signification-perceptual understanding and tactile sensation.

Case 33:

When Sylvia Lange showed her competence in her non-traditional work, she thought she became a boy. "I discovered in myself that I could do things I didn't know I could do, and I became one of the boys, genuinely" (AC, p. 250).

In Sylvia's statement, she being a girl became one of the boys. She discovered that she could do things that conventional culture did not tell her she could do. Since culture ideologically defined non-
traditional work as a men's job, she couldn't find her identity in the
category woman so that she thought she, being a woman, became one
of male workers. Because the culture of category woman cannot
explain what she did, she defined herself as the opposite sex of the
sexual dualism.

Case 34:

Deborah talked about her ambiguity of sexual identity: "The
first few years when I was a postdoc and doing to meetings. I was
out there partying with everybody else. I somehow became very
aware of that as something I didn't want to do, because it looks one
way in a woman, and it looks like something else in a man" (WSS, p.
42).

In Deborah's experience, one way in a woman and something
else in a man present her ambiguity of sexual identity. She did not
want to be a woman and a man in one body. However, in the social
rules of sexual dualism, there are only one way in a man and the
other in a men's called woman. Since sexual binary oppositions are
constructed under a phallocentric culture, the female corporeity in
technoscience cannot be explained in the system of signification in
sexual dualism, but exists as a different individual perception in a
poli-centric field of experiences.

Case 35:

Ignoring being a woman or a man, Amy Kelley claimed that she
was not any sex at all. "As soon as I walk in the door at work it's like
I'm not any sex at all. It's no sex at all. It doesn't matter if I'm a
man or a woman. I'm a machinist. I can do the work. The guys look
at me, not because I'm a woman, but because I'm a machinist. And that feels real good" (AC, p. 130).

In Amy's story, being neither a woman nor a man disrupts and undoes the hierarchy of sexual dualism. She did not want to be any sex in the binary oppositions. The work that she was doing does not belong to any sex-male or female—at all either. She rejected belonging to any binary sex but identified herself with a machinist. Because she was a machinist, she denied herself as a category woman or a man. She legitimated a machinist as a sexual otherwise and played a machinist in a system of sexual differance. A machinist is neither a man's job nor a woman's job, but a job of sexual otherwise.

In the above cases, they all showed some kind of ambiguity between sexual binary oppositions but they stood somewhere in-between. Derrida (1988) explicates.

The relationship would not be a-sexual, far from it, but would be sexual otherwise: beyond the binary difference that governs the decorum of all codes . . . I would like to believe in the multiplicity of sexually marked voices. (p. 184)

Thus, the female subjectivity in phallocentric technoscience may be shown in a play of differance. The female corporeal existence in technoscience could present and represent the in-between identity. However, the concept of differance is generated to deconstruct visual language system; it may be constrained by its presumption which we'll discuss in the further chapter. Moreover, technoscientific field has to be poli-centrically oriented so that the female different corporeal experience can not only be explained in the dialogical
structure but also present as individual otherwise by her concrete perception and tactility.

Summary

The women's stories inscribed in Alone in a Crowd and Who Succeeds in Science are read and interpreted in order to deconstruct the phallocentrism in technoscience. In articulation with a deconstructive practice, three main themes are discussed by textual analysis:

1. an unstable field of the sensuous body: opening the possibility for change;
2. a multiplicity of the political body: legitimating the inappropriate/marginalized otherness;
3. the sexual differance in the body politic: the in-between identity.

The female sensuous/corporeal existence in technoscience may open the possibility to challenge the traditional ideology of job segregation and create an intercorporeal dialogue to dance in a free play of non-hierarchical and non-stable system. Though the female body has been culturally defined as inferiority and incapability in technoscience, the body as a political multiplicity of marginalized minority, inappropriate sexed otherness, and pregnancy potential, may disrupt the hierarchical system of masculinity and destabilize gender power relations by her concrete tactile sensation. The female identity in technoscience is neither in a category woman nor in a man, but rather sexual otherwise. The female individual body/subject in technoscience can be explained in a field of poli-
centrical experiences—not only generating we-consciousness in a
dialogical structure of technoscientific fields but also presenting as
individual otherwise by her concrete perception and tactility.
CHAPTER 5

CONCLUSION

In this chapter, I would try to build a theory according to the previous discussion since this is the purpose of textual analysis. In this theory building project, I'd like to show the restriction of dualism and the limitation of deconstruction from the view of the sensuous body. Further, in a summary, the problems of the study and further studies will be discussed at the end.

Building a Theory: Tactility as the Concrete Source of Deconstruction

In this part, I would like to show: first, the female sensuous experience in technoscience disrupts and destabilizes the system of signification in sexual dualism. Secondly, the deconstructive strategy is limited by its assumption in a language system. From our text reading, it may conclude that the concrete tactility can be a source of deconstruction which opens the possibility of politic otherwise and concretizes the unstable and undecidable identity.

From the above textual analyses, the meaning of the female corporeal existence in phallocentric technoscience cannot be explained in the system of sexual dualism. Neither a woman nor a man is the strictest claim to challenge the female/male dualism. Woman and man have been thought as an identity of either/or

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dichotomy. Neither/nor as a deconstructive practice could intervene a dual system. In a system of binary opposition, one side has been culturally presumed as center and dominance; the other as subordination. Moreover, dualism, an either/or system, always plays certainty for subjective construction. The body/subject has to be either this or that in cultural dualism. In our texts, since technoscience is culturally associated with masculinity, a female body in technoscience has to be seen as the inappropriate other. In the cultural ideology of sexual difference, the female body has to do something culturally defined femininity; on the contrary, the male body does something masculine. The linear relation of technoscience in articulation with masculinity maintains the hierarchical position in the system of dualism and constrains politic otherwise to operate multiplicity of meanings. In structuralism, dualism has been seen as a process of cultural signification by which meanings are constructed by binary oppositions; namely, the difference of things is distinguished in an either/or system. However, different from structuralism, deconstruction critiques that the system of dualism manipulates and constrains the production of meaning. Moreover, it has been argued that there is no difference in the system of dualism since the hierarchical one is the center of the meaning so that the other would not exist in the binary system. Thus, from a deconstructive practice, the female corporeal experience in technoscience doesn’t exist and cannot mean anything within an either/or system of dualism.
The female bodily being in technoscience as a process of transformation rejects belonging to a category woman but transforms into a worker by concrete perceptual experience and self-interpretation. As Pilotta and Mickunas (1990) indicate that "the process of transformation requires an identification with an event, which is incantated in communication" (p. 143). In a poli-centric field of experiences, the female individual identification within a technoscientific field is differentiated from others but a result of her corporeal perception and tactile sensation of mechanic, technical, scientific, and technological work. Moreover, in a poli-centric dialogue, the various individual beings are co-present as centers to construct the relation between subjects and objects. Pilotta and Mickunas (1990) elaborate that.

The others are always co-present and co-engaged in a way that neither the self nor the others are constituted one through the other's internal projections or inner representations but rather emerge in a dialogue structured poli-centrically. Each self constitutes a unique addition, a specific point of reference to a common field of signification implicating the meanings of objects and subjective states. (p. 63)

The practice of continually displacing the center in deconstruction might be seen as a poli-centric dialogical relation. The female corporeity can be one of the centers in the technoscientific field and present her individual perceptual experiences differentiated from others'.
It is the female bodily perception in technoscience that presents concrete meaning for the women working in a culturally defined masculine field. The perceptual experience concretizes the bodily identity and subjectivity beyond binary dualism. In dualism, she being-toward-technoscientific-world cannot be defined as a woman or a man; namely, her sexual identity seems ambiguous. From a deconstructive interpretation, the female identity in technoscience can be found in a play of differance - a free play of undecidability and irreducibility. However, in our text reading, we see that this unstable and undecidable identity is significantly based on the elementary tactile sensation - the tactile relationship between the female body and technoscientific things. The in-between identity cannot be constructed without concrete sensuous communication between the body and things. By identity, it may mean to associate with a certain group or to dissociate with some other groups. Since identity provides certain meaning for the body/subject, how can an identity be unstable or undecidable? The unstable and undecidable identity comes from neither/nor but rather/and in the binary oppositions. Neither a woman nor a man but rather a woman and a man presents unstable identity which results from concrete tactile perception. In our study of women in technoscience, when the body cannot identify herself as a woman as well as a man, her identity could be something otherwise that conventional culture cannot define. Biologically, she is a woman; socially and culturally, she does not belong to the category woman. What she identifies with is unstable and undecidable but is concretized by her bodily tactility.
with technoscientific things. She may not be a-sexual, but sexual otherwise by her tactile sensation.

The concept of deconstruction may help us understand and interpret the hierarchical relationship between the binary oppositions but it is also limited itself in a language system. In fact, deconstruction focuses on speech/writing dualism and attempts to undo and subvert the hierarchical privilege of speech by reversing the center to writing. It somehow awakens the structuralists that auditive sense in speech constrains the visual differences. Thus, Derrida creates the unstable term *differance* to disrupt and destabilize the system of speech/writing dualism. However, what Derrida misses is tactile sensation. In our textual analyses, we see the touching from the female subject to the technoscientific things as the most concrete movement to show the fact that women can be the center in the mechanical, technical, scientific, and systematic work. Such sensuous "communication is not deconstructed, since it is the source of deconstruction. What has been deconstructed is the identity of signification, the linguistic articulation of things and objects . . . " (Pilotta, 1996, p. 224). The tactility is the most concrete movement that establishes meaning between the body and things. The meaning of the unstable identity might be disappeared if the exploratory female tactile perception in technoscience is eliminated. The neither-nor identity is generated by the elementary tactile sensation from the female body to the technoscientific things. As Merleau-Ponty (1962) illustrates.
When one of my hands touches the other, the hand that moves functions as subject and the other as object. There are tactile phenomena, alleged tactile qualities, like roughness and smoothness, which disappear completely if the exploratory movements is eliminated. Movement and time are not only an objective condition of knowing touch, but a phenomenal component of tactile data. They bring about the patterning of tactile phenomena, just as light shows up the configuration of a visible surface. Smoothness is not a collection of similar pressures, but the way in which a surface utilizes the time occupied by our tactile exploration or modulates the movement of our hand. The style of these modulations particularizes so many modes of appearance of the tactile phenomenon, which are not reducible to each other and cannot be deduced from an elementary tactile sensation. (Merleau-Ponty, 1962, p. 315)

Beyond the speech/writing dualism, the elementary tactile sensation cannot be reducible to any language system. It presents the most fundamental concrete perception to form the subjective ego-identity. "The body is borne towards tactile experience by all its surfaces and all its organs simultaneously, and carries with it a certain typical structure of the tactile 'world'" (Merleau-Ponty, 1962, p. 317). The body as being toward the tactile world may challenge the deconstructive emphasis on speech/writing dual system and open up the possible otherwise by sensuous communication between the body/subject and external things.
This sensuous tactility as a political source may present politic otherwise. Though the phallocentrism summons that women cannot do and know technoscientific fields over and over again, the female tactile perception as a politic otherwise presents and represents her concretization of the senses in mechanical, technical, scientific, and technological work. The female sensation-field of her body perceives bodily movement kinesthetically in technoscience which may mediate the identification of politic otherwise. As Pilotta (1996) explicates:

This sensitivity to my own body is perceived sensuously and identified through movement; movement mediates this identification. For I recognize this hand I see, this face I touch, as alive because I perceive movement in them kinesthetically, from within the sensation-field of my body. . . Movement is the co-ordinator that permits perceiving as a synthesis a sensitive zone and a sensible substance perceived externally. (p. 84)

The bodily movement concretely synthesizes the relationship between the corporeal being and external objects. The female bodily being identifies herself with technoscience through bodily movements and tactile sensation which extend the body kinesthetically to perceive technoscientific things and differentiate the subject and the object in the process of identification. The body as a perceptual field founds effective touching which can be a political source and transform the body/subject into an desired entity. It is this tactile phenomenon which occurs ahead of the
female body so that she can transform her identity from culturally called a real woman to a woman working in a forbidden field.

I am able to touch effectively only if the phenomenon finds an echo within me, if it accords with a certain nature of my consciousness, and if the organ which goes out to meet it is synchronized with it. The unity and identity of the tactile phenomenon do not come about through any synthesis of recognition in the concept, they are founded upon the unity and identity of the body as a synergic totality. (Merleau-Ponty, 1962, p. 316-317)

The female identity in the tactile phenomenon of technoscience may be ambiguous in the system of sexual dualism, but is concrete by her perceptual understanding and tactile experience.

The female tactile sensation in technoscience is a deconstructive source, a liberating force, and a resistant power. It may threaten the dominant masculine culture in technoscience. It could undo the hierarchy of system which associates technoscience with phallocentrism. The concrete tactility as a deconstructive communication disrupts and intervenes the system of signification in dualism. It also destabilizes the certainty of the constructed ideological culture and complicates sexual differences in gender relations. The body in the tactile phenomenon is not illusory but concrete existence. The female tactile experience in technoscience is not a production of dis-identification, but a result of concrete identity which requires her individual perceptual understanding in a poli-centric dialogical field. The female body as a politic otherwise in
technoscience transforms herself beyond a binary structure by concrete and elementary tactile sensation.

Summary

Many studies have shown that technoscience is culturally and ideologically defined as a phallocentric field. The female corporeal experience in technoscience has been seen as marginalized otherness. Since cultural normalization of gender/sex dualism suppresses female corporeity in technoscience, even many women have less confidence to do the work though they have competence. This study attempts to focus on the female experience in technoscience and to see their corporeal confrontations, difficulties, struggles, and resistances. The goal is to rethink the female sensuous corporeity, the political body, and the body politic in technoscience by reading the texts of female bodily experience with a deconstructive interpretation.

From reviewing feminist perspectives in gendered technoscience, many previous studies still limit their arguments in sexual dualism and accuse phallocentric culture to forbid female corporeal existence in technoscience. They might try to fight for female liberation but still constrain their statements in either/or binary oppositions. Moreover, some of their notions about the body also dwell in the mind/body dualism which could not explain the female bodily movement/experience in technoscience beyond the mind. Though feminist scholars like Haraway present the concept of cyborg which try to interpret the subject beyond dualism, the cyborg (human/machine in one body) concept as a metaphor is an imaginary
and utopian body for encouraging women experiencing technoscience. Unlike their work, this study tries to go back to women's stories in the experiential domain, not in an imaginary/fictional world, to re-consider their live stories as corporeal existence in power relations, and to re-read them with a deconstructive concept.

Since deconstruction provides an interpretative way which exceeds the boundaries of hierarchical hegemony in the binary opposition and destabilizes the definable and determinable meanings with multiple different political concerns, this study tries to use deconstruction concept and seek the unstable and undecidable power relation in the body politic of technoscientific culture. In deconstruction, the privileged master is continually displaced by the inappropriate, ignored, and marginalized other which might open the possibility to challenge the predeterminate culture. Moreover, the play of differance presents the possible and impossible meaning of the in-between. Those thoughts might untie the boundary of oppositional dualism. Thus, deconstruction may provide a tool to interpret female corporeity in technoscience beyond sexual dualism.

The texts for this reading project are chosen because they provide female experiences in male dominant professions and because they inscribe not only their working experiences but also their personal lives in relation to their professional careers. In Alone in a Crowd, there are twenty-five women from different ages, educations, sexual orientations and races working in non-traditional jobs. In Who Succeeds in Science, ten female scientists in academia
or research fields tell their live stories. The main concern of this study is to build up a theory or concept by textual analysis so that it is important to articulate female corporeal existence in technoscience with a scholarly deconstructive practice.

From text reading, the fact of female bodily experience in technoscience opens the possibility to challenge the traditional ideology of job segregation. The female corporeal existence in technoscience breaks up the myth of female inferiority in understanding technoscience. Her sensuous body in technoscience shows instability of culturally defined being-to-the-dual-sex-world. Moreover, the body as an unstable field in-between traditional and non-traditional, femininity and masculinity, subjectivity and objectivity, emotion and rationality, invisible and visible, and impossible and possible. The female bodily being toward technoscience though presents ambiguity since her corporeal experiential accumulation sediments in a mainly men's sphere, but her bodily experience is a concrete result of elementary tactile sensation.

From the female corporeal experience in technoscience, the know-how skill/knowledge present as a power in her corporeity, though culture, society, and men may try to confuse her that she should not involve being toward technoscientific world. In the culture of technoscience, the female body is a multiplicity of marginalized minority, inappropriate sexed otherness, pregnancy potential, and resistance from hierarchical power of masculinity. The female corporeity is the source and site for the will to power and the
movement of active forces toward the technoscientific world. On the other hand, to meet minority quota, being a woman is a corporeal existence for the quota number. In addition, the minority quota shows the problem of privileged masculine dominance in technoscience which is not natural, but a technique of bio-power. From fear to independence and from anger to fight, the female corporeity as a political source operates unstable forces to make power relation dynamic and to decentralize privileged conventional binary culture. Moreover, when the female corporeal existence in technoscience opens up the possibility for transforming the ideological culture of sexual dualism, the pregnant potential as an active force may intervene power relations and destabilize the hierarchical system. Therefore, the cultural defined body with inferior and incapable knowledge, the other sex/gender, the inappropriate minority, and the body with a womb could be possible otherwise as the center in a poli-centric field of experiences.

The female body/subject in technoscience may dislocate, disaffiliate and disengage herself from the category woman and open the possibilities to transform and reconstruct her identity. Her rejection of belonging does not mean to deny her sexual existence but presents her identity with a concrete tactile field. Women in technoscience are neither present nor absent, but rather present and absent. The female subjectivity in technoscience might be found in a system of sexual differance. She is neither a woman nor a man, but rather a woman and a man. However, the concept of differance is constrained in a speech/writing dualism which may ignore the
elementary tactile experience. In our study, it shows that the female identity in technoscience is generated by the concrete tactile sensation from the female body to the technoscientific things. The process of identification requires kinesthetic movement and perceptual understanding. The female sensuous tactility as a political source deconstructs binary systems and transforms herself into a politic otherwise by her concretization of the senses in technoscience.

The Problems of the Study

What this study has done is that: first, it provides one of possible deconstructive interpretations for reading texts; second, it shows the problem of dualism and the limitation of a deconstructive strategy; third, beyond gendered technoscience, this study concludes that the female body as a politic otherwise in technoscience transforms herself beyond a binary structure by concrete and elementary tactile sensation. The possible problems in this study may be: first, since the body theory has a background of phenomenology which has been criticized by Derrida, the interweaving between the body politic and deconstruction seems inappropriate in this study. Scholars in phenomenology and deconstruction have debated against each other; however, their arguments (Evans, McKenna and Hopkins, 1995) focus on the indicative and expressive meanings in speech and writing which are not the polemic area in this study. The purpose of this study is not to argue the theory of deconstruction but to use the concept of a deconstructive practice in textual analysis. Second, some scholars.
like Ellis (1989), argue that the mechanism of deconstruction seems illusory so that interpretation may turn to nihilism. For instance, a play of *differance* shows no position at all and may not present the subject with any quality and attributes. However, this study explains that this unstable identity requires a process of concrete bodily movements and tactile experiences which provide ambiguous forces which may intervene the conventional binary system. Third, the editors' positions in the texts sometimes influence our understanding of texts. Especially in *Who Succeeds in Science*, the editors not only quote the statements from the interviewees but also frequently add their own values in the texts. For example, they may use "successful," "workaholic," "ambitious," or "gender-blind" to describe someone without quoting any phrases from interviewees. However, I have tried to avoided all the comments from editors but only focused on what the interviewee expressed.

**Further Study**

As the previous literature mentions, text is an open field in which the free play of interpretation can be employed. Thus, this study is just one of possible interpretations. We may expect to see more and more different interpretations and theory-building projects from reading the female corporeal existence in technoscience. For instance, psychoanalysis may be a perspective for re-reading those texts and seek the subjective identity of the female body. Trying using different approaches has to be encouraged since we may find different conclusions from reading the same text. In addition, for different research purposes, some researchers may like
to design their own questions and conduct a focus interview or sense making interview to collect first-hand data and analyze them with their own perspectives.
APPENDIX A

THE BELIEF BACKGROUNDS OF WOMEN IN ALONE IN A CROWD

1. Mary Rathke, steel hauler
   -- in 1963, dropped out of medical school that her mother wanted her to go. but she was not interested in it.
   -- went to work at a insurance company and felt terrible working with women
   -- married and had a couple of babies
   -- did waitressing work in 1967
   -- working at the library with low pay, although she liked library work.
   -- in 1974, cement-truck driver
   -- 1977, steel hauler

2. Laura Pfandler, pipefitter
   -- got a master's in elementary education (her parents thought she would make a good teacher.)
   -- taught kindergarten through sixth grade. but left the job due to low pay.
   -- pipefitter

3. Diana Clarke, fire fighter
   -- played outside a lot with her bothers and boys from the neighborhood.
   -- studied graphic arts in college.
   -- have had about twenty-five jobs-a lab assistant, switchboard operator, graphic artist, and seamstress. worked in nursing homes. been a governess, waitress, truck driver, bartender, and cook.
   -- during college, found out about fire fighting.

4. Elaine Canfield, carpenter
   -- played the flute
parents never steered her in the direction of a profession, but hoped she would have a traditional marriage and be the woman behind the great man.
-- in college, studied archeology, English and anthropology, graduated in 1975.
-- 1977, get accepted into a CETA program and learned about carpentry.

5. Irene Hull, shipwright/bindery worker
-- family was very poor in Depression
-- graduated in 1934 from UCLA with bachelor's in education, but not interested in teaching.
-- got a playground job
-- married in 1937, then had 3 kids
-- worked as a nursery-school teacher with low pay
-- in 1942 worked as shipwright.
-- in 1944 got laid off, back to teaching job.
-- 1946 or 47 apprentice bindery worker; quit because of family problems.
-- got a job in a laundry
-- in 1956 back to bindery worker

6. Angela Summer, plumber
-- catholic family (father as a tankerman, mother as a housewife) family support whatever she did.
-- waitress, apple picking, taxi driving at 18 age
-- work in a can factory at 19 age
-- plumber for better pay

7. Kathryn Brooke, soldier/long-haul trucker/ bus driver
-- catholic family (parents thought she should be a nun.
-- asked her to leave in high school
-- waitress
-- marry at 17 and 3 kids, left her husband from beating in 1964; marry again at 21
-- born-again christian; then go back to school and finish high school, marry again
-- in college, join in army, husband left
-- injury, left army
-- trucker
-- bus driver, left due to injury
8. Teresa Selfe, sailor
-- slender, fragile in appearance, soft-spoken, active and functioning lesbian
-- working in restaurants, selling shoes, working in a bookstore
-- 1979, painting, sanding, working for building renovated
-- 1980, sailor

9. Nora Quealey, truck assembly line worker
-- 3 kids, kids were her life
-- not finish high school
-- work for extra money, truck assembly line worker without a diploma, husband left
-- heavy injury, left job (37 years old)
-- still dreaming of being a housewife

10. Lydia Vasquez, machine operator
-- Mexican, speaking Spanish
-- Mom sick, so taking care of home (6 younger sisters and brothers)
-- quit school in the fifth grade
-- housework, ironing, and babysitting, washing dishes at hospital (2 years), then married
-- husband as carpenter, 3 boys
-- separated after 6 years marriage
-- doing work in the field, low pay
-- cook and waitress in a restaurant.
-- 1965, married again to a serviceman.
-- husband went overseas to Vietnam, started working in a day-care center until 1967 husband came back
-- 1973, working outside again in a restaurant, then janitoress in a machine shop, then, learning running machine
-- 1979, quit job due to heavy injury

11. Geraldine Walker, shipscaler
-- divorce, single parent with 5 kids.
-- sorting letters at the post office
-- 1974, find a job in the shipyards with a female friend
-- one of the first black supervisors at the shipyards from 1978.
-- vice-president of the Shipscalers Union
12. Amy Kelley, machinist
   -- Japanese
   -- parents divorce when she was nine. (father as a cook, mother as a pressman and janitress)
   -- Her aunt, as a journeyman printer, influenced her a lot.
   -- 1969, working in a knitting company when being a high school student
   -- 1971, waitress in a drive-in restaurant, low pay
   -- 1972, due to husband's encouragement, training as a machinist and find a job in aircraft industry

13. Katie Murray, sheet metal worker
   -- black
   -- wanted to be a beautician
   -- working on the farm in North Carolina
   -- 1962, pregnant in New Jersey, working in a mattress factory
   -- working at a sewing-machine plant until 1968, then married
   -- 1970, left husband, motel work-chambermaid
   -- 1974, sheet metal worker in a truck plant

14. Jo Ann Johnson, painter
   -- nurse in a hospital when 20 years old, get fired
   -- 1975, married and work in another hospital, and quit, one kid
   -- 1977, painter at the aircraft plant

15. Marge Kirk, concrete-truck driver
   -- black, Catholic high school
   -- farming, waitressing
   -- long-distance operator in the phone company
   -- kitchen work
   -- 1977, taking truck-driving class
   -- truck driver in construction and concrete companies

16. Barbara Shaman, outside machinist
   -- a degree in business administration
   -- two years as a Peace Corps volunteer in the Philippines
   -- 1976, shipscaler
   -- 1977, outside machinist
   -- electrician

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17. Laura Sarvis, Sawyer/bench worker
-- her mother as a teacher, divorced and independent, influenced her
-- quit school in eleventh grade, dishwasher
-- working in a nursing home
-- 1976, working in a wood mill
-- benchwork at a Boeing subcontractor

18. Linda Lanham, union organizer
-- college degree, divorced, 3 kids
-- worked as a tavern manager, restaurant manager, dental assistant
-- dispatcher for Boeing
-- 1980, union work

19. Anna Brinkley, electrician
-- black, restaurant work when being a college student
-- first husband, as an electrician, 2 kids
-- husband left due to she went to trade school
-- 1977, electrician, married again
-- 1978, maintenance electrician

20. Arlene Tupper, transit supervisor
-- 14 years old, working at a men's clothing store, then in a doughnut
  factory, a candy store, at the post office
-- 1957, draftsman
-- 1958, married, husband as a draftsman too; 1961 quitting, for kids,
  3 kids
-- husband laid off, she back to work at a department store for 3
  years
-- 1973, bus driver; 1975, supervisor

21. Kathy Baerney, telephone frameman
-- 1965, a high school student, working for the phone company
-- 1971, frameman
-- 1974, switchman
-- married and had 2 kids
-- quit job in the phone company for family, and working as a clerk

22. Michelle Sanborn, label printer
-- never knew father, mother died when she was a baby
-- grandmother raised her, living in public housing
-- in tenth grade, working in a restaurant
working in a nursing home in a kitchen
finished high school, got married and had 2 kids
1971, nurse's aide, then a doctor's receptionist
working in a plastic bags factory
rewinder, then printer

23. Beth Gedney, tugboat mate
father as a sea captain
1975, California Maritime Academy, got her BS in nautical industrial technology
1979, graduate, tugboat mate
married and had kids

24. Sylvia Lange, gillnetter
Cordoba
working in a cannery
waitress
family like going fishing
1967, 14 years old, get license
fisherman, 18 years old

25. Beverly Brown, papermaker
needlework and beadwork
warehouse work, laid off
papermaker
married for two and a half years, one kid
APPENDIX B

THE BRIEF BACKGROUNDS OF WOMEN IN WHO SUCCEEDS IN SCIENCE

1. Ann
   -- grew up on a farm
   -- successful scientist in her fifties
   -- a leader in her research specialty
   -- married twice, no kids: second husband was a scientist in the same field

2. Barbara
   -- leader in her field of research
   -- married with one kid
   -- husband, a scientist in another branch of the same discipline

3. Christine
   -- never been married
   -- from a scientifically inclined family (grandfather was a famous scientist; all the family work as scientists
   -- mother was a research assistant at a university

4. Deborah
   -- married with two kids
   -- father as an engineer, mother as a schoolteacher
   -- husband, as self-employed professional with irregular income

5. Elizabeth
   -- married twice, one kid
   -- father as a farmer
   -- second husband closed related to her in her field

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6. Florence
-- high-level academic administrator
-- father as a science professor
-- never married
-- faculty position
-- realize herself not doing any research but teaching
-- promoted into academic administration

7. Gail
-- parents are blue-collar
-- a laboratory technician for two years after college
-- really didn't want to be a research scientist, but like to do policy
-- now, a science consultant for the government
-- married, no kid; husband, a scientist professor in the same discipline

8. Holly
-- married twice, 2 kids
-- grew up as one of eight kids in a foreign country
-- father as a judge
-- immigrated to the US and became a housewife and mother
-- after postdoc fellowship, got an assistant professor position; quit due to second husband's work place is far from hers
-- second husband, a full professor
-- works for a major company doing technical work

9. Irene
-- an administrative position at a university
-- married, one kid; husband in the same field
-- grew up in a small rural town, father got a Ph.D. and was a scientist
-- husband as a full-time assistant professor, but she as a part-time lecturer at the same university; finally didn't get tenure
-- a research associate on her husband's projects

10. Jane
-- a teaching certificate
-- married, 4 kids (2 from husband's family)
-- quit academic career due to not getting tenure and dissatisfaction with the social system and culture of science
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