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"Gender Gaps, Information Technology, and Academic Libraries: A Feminist Evaluation

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GENDER GAPS, INFORMATION TECHNOLOGY, AND
ACADEMIC LIBRARIES: A FEMINIST EVALUATION

by

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STATEMENT BY AUTHOR

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ABSTRACT

This thesis examines the relationship between gender gaps and the increased use of information technology (IT) in academic libraries from a feminist perspective. Since the 1960s, more academic libraries have been utilizing IT in their quest to bring more and faster information to their users. Though information technology has advantages, the increased presence of it brings disadvantages such as gender gaps as well. Therefore, it is vital that the library profession examines the impacts both positive and negative of IT.

In order to effectively evaluate IT, gender gaps and academic libraries, it is necessary to examine related phenomena. Therefore, research was conducted on biology and gender; education and information technology; information technology and socio-cultural influences; information technology and libraries; and feminism and academic libraries. Each of these topics contributes to a clearer understanding of why IT related gender gaps exist in academic librarianship.
INTRODUCTION

[W]hat we will need is a conspiracy of sisters that begins with the recognition that there is nothing inherently masculine about computers. We must learn to read the computer culture for the social myth that it is. And we have to teach our younger generation of women that they are free to explore computers in their own way and to draw their own conclusions about the usefulness of these machines. And we start it all with a simple thought that could be the beginning of a revolution: How hard can it be? (Coyle 54).

The purpose of the following research is to investigate the environment contributing to gender gaps in information technology (IT) related fields such as academic librarianship through a feminist perspective. Research in IT fields suggests that despite equal education and experience, salary differences between the sexes and a disproportionate number of men in IT professions are commonplace. In order to evaluate these phenomena and possibly suggest ways of dismantling the myths that perpetuate gender gaps in IT professions, including academic librarianship, a feminist analysis incorporating Marxist feminism, poststructuralism, and standpoint epistemology will be used. Gunton defines information technology as

[e]lectronic technologies for collecting, storing, processing and communicating information. They can be separated into two main categories - those which process information, such as computer systems, and those which disseminate information, such as telecommunication systems. Increasingly, information technology is used to describe systems that combine both (96).

This thesis will be constructed in such a way as to answer the following research question:

By using feminist theory, can academic librarians better explain and understand the relationship between existing gender gaps and the increased use of information technology?
The research problem that will be addressed here incorporates scholarship from the fields of business administration, communication, computer science, library and information science, management information systems, sociology, and women’s studies. It was necessary to go outside the sphere of traditional library and information science because the proposed research question is not traditional in nature. This research explores theoretical and underlying implications of technology, rather than the more pragmatic issues of academic librarianship.

In the process of research, however, several other questions surfaced which impacted the result of the stated question. Therefore, from this research question the author formulated several other questions:

- Are computer-related professions and markets saturated with gender differentiations?
- Are gender gaps in computer technology due to biology or socialization and culture?
- What kind of feminism exists in librarianship and can this grant agency to female librarians?

Overview

Chapter one examines current and projected demographics of the labor market and the effects of information technology on future jobs. A brief overview of IT in schools and the effects of IT on girls and boys is also presented. Finally, the increased use of IT in academic libraries and the changing nature of librarians’ tasks is examined. This summary will provide a background for the proposed research question.
Chapter two consists of a literature review. The literature review itself is separated into five sections -- biology and gender; IT and education; socio-cultural myths and IT; IT and libraries; and feminism and academic librarians. The section on biology and gender introduces the reader to underlying assumptions and questions regarding the "nature vs. nurture" argument and the influence, if any, on IT. After arguing that biology is not responsible for IT-related gender gaps, the second section will present an examination of IT in education which suggests the influence that IT in schools has on future attitudes, education for young girls and employment choices for young women regarding information technology. The next section examines the impact of socio-cultural influences that have fed into existing myths regarding girls’ and women's ties to information technology. The fourth section suggests that women's skills in IT are often not given proper credit as professional expertise. Research suggests that this is the case in academic librarianship, which is why an overview of the use of information technology in librarianship is necessary. Finally, the last section presents a historical overview of feminism in academic librarianship. Because issues of feminism and gender are so closely linked to one another, a discussion of feminism within librarianship will be presented. Dilevko and Harris maintain that there are significant common threads that weave together issues of technology, gender and librarianship:

Inevitably, the study of technology and social relations involves the study of gender because gender is one of the major structures of the social order and gender relations are found wherever people are found. In the context of libraries and librarianship, this relationship is particularly important because of the female-intensive history of the profession (719).
The work of feminist librarians such as Suzanne Hildenbrand and Sarah Pritchard will be examined to present a historical evaluation of feminism and academic librarians, and the potential of feminism to influence librarians in the next millennium.

Chapter three establishes a feminist methodological framework for the purposes of evaluating the aforementioned research question. Although there is an abundance of various schools of thought within feminist scholarship, this thesis examines IT and gender gaps through Marxist feminist, poststructuralist, and standpoint epistemologist analyses. This evaluation will attempt to lay a foundation for suggestions of change in academic librarianship in order to begin a deconstruction of gender gaps relating to information technology in academic libraries.

Chapter four presents conclusions based on the research that was evaluated in this thesis regarding IT, gender gaps and academic libraries. Following the conclusions, recommendations are made in chapter five which could assist in dismantling gender gaps in academic libraries.

Statement of the Problem

The demographics of the labor market are changing. It is projected that 47 percent of the workforce will be women by the year 2000. During this time, women are expected to comprise three-fifths of the new employees with technological jobs becoming one of the top three markets (Igbaria and Chidambaram 1997). At the same time, computer technology use in academic libraries has been increasing since the 1960s.

When describing what information technology professionals are, computer scientists, systems analysts, computer programmers, information science directors, and
application developers come to mind. However, librarians' work is now highly technological in nature, as well. With the increasing visibility and reliance on computer technology in academic libraries, job tasks are changing radically for librarians. Dilevko and Harris believe that the "work of professional library practitioners is beginning to resemble that of computer scientists and business administrators" (719).

Despite the fact that librarians’ job descriptions are more likely to match those of an information technologist, librarians are not paid as much as other information technologists. According to the most recent data, the mean annual salary for a computer analyst and/or scientist is $41,838.00 per year, while a librarian's mean annual salary is only $26,499.00 per year (Government Information Sharing Project 1990). The amount of monetary compensation that one receives from her/his job is often a sign of status.

Since the 1960s, librarians have been using computers daily as part of their jobs. Besides accessing, evaluating and searching electronic databases, librarians now teach students, faculty and staff. Computer technology is significantly changing the way librarians do their job. Besides making journals, newspapers, documents, artwork, and web pages readily accessible to users, increased automation is changing customer service duties with electronic reference; bibliographic instruction is now becoming “information literacy;” and colleges and universities across the country are initiating digitization projects. It is now a necessity, rather than a matter of choice, for academic librarians to learn how to use such electronic resources – OPACs (on-line public access catalogs), CD-ROMs, electronic databases, e-reserves, electronic journals, and electronic mailing lists.
for professional communication. The list could continue. Goven sums up the current situation by saying that

[i]t is startling to realize that in 1983, as I recently read, no library owned a CD-ROM … when one thinks of the widespread use of them today, one wonders about the future proliferation of other forms of digitized information: intelligent workstations, optical scanners and optical discs, expert systems, artificial intelligence, hypertext, broadbands and satellites, local area networks (LANs) and other kinds of networks, as well as devices yet unknown…(24).

All of this demonstrates that librarianship has been a information technology profession for almost forty years. There’s a pervasive myth that women are not entering into information technology (IT)-related fields. However, this is disputed by the fact that librarianship is made up of an eighty-five per cent female work force (Hildenbrand 44). Could part of the problem lie in the fact that librarians’ work as information technologists is ignored because it is generally a conservative, female dominated profession on the low end of the pay scale? This argument will be expounded upon when analyzing the stated research question from a Marxist feminist perspective in chapter 3.1.
LITERATURE REVIEW

The principal means of collecting data for this thesis consisted of a literature review. The literature review is comprised of primary research from areas of specialization and utilization of pertinent databases such as Contemporary Women's Issues, ERIC (Educational Resources Information Center), GenderWatch, Inspec, Library Literature, PsychINFO, Sociological Abstracts, and Women's Resources International. Relevant government documents from the Census Bureau and the Departments of Education and Labor were examined as well. Much of the literature that was reviewed included data and/or case studies gathered by the author(s) or by federal or state government agencies. By using resources from such diverse disciplines, a far reaching perspective is presented on the current situation.

The literature review is organized in five sections - each contributing to a clearer understanding of the relationship between gender gaps and information technology in academic libraries.

Biology and Gender

Before examining gender gaps it is necessary to understand why there are questions regarding women's technological capabilities. The issue of biological, neurological differences between females and males has been an ensuing debate between hard scientists and social scientists. But are there sex differences when it comes to understanding and using technology? Before examining gender gaps and information technology, it is essential to discuss this which will show these beliefs to be unfounded.
Because infant girls and boys are socialized almost immediately after birth, it is impossible to completely discount socialization in our society (Lipsitz Bem 141). This means that unless one hypothetically raised a female baby/child away from the rest of society to be free of gender bias in everything, at some level -- family, school, the neighborhood, television, etc. -- gender roles will be learned according to the patriarchal, male-centered society that we live in.

Riger, the chair of Women's Studies at the University of Illinois-Chicago, argues that there are five approaches to understanding gender differences: 1.) the “sociobiology” argument; 2.) the differently situated argument; 3.) the “contingent” argument; 4.) the “no differences” argument; and 5.) the “disadvantage, not difference” argument (396-399). Instead of presenting only one point of view, Riger suggests that these five arguments have legitimacy through triangulation by providing a broad portrayal of the nature vs. nurture debate.

Sociobiology researchers maintain that there are clear differences that are in some way biologically based, and carry over into our social lives. Though some evolutionary psychologists such as Buss argue this, Fausto-Sterling maintains that Buss' argument is not based on human evolutionary data and is, therefore, at the very best speculative in nature ("Beyond Difference" 233).

"Differently situated" scholars maintain that while there may be distinct sex differences, they are not biologically based, but rather socially based. An excellent example of this is presented in Eagly's book Sex Differences in Social Behavior: A Social-Role Interpretation which claims that the division of labor between the sexes
produces gender-role expectations and sex-typed skills and beliefs that in turn reinforce gender differences in social behavior.

Proponents of the "contingent" argument maintain that supposed sex differences tend to mollify when other factors are taken into account. For example, research findings suggest that spatial visualization differences in female and male neurology have decreased by 59% in the past 40 years. Feingold points out that this dramatic difference could be accounted for by better testing methods which have led to more precise measurements, or certain societal factors which have impacted the differences as well (Riger 98).

Researchers who subscribe to the "no differences" argument adamantly reject the claim to any sex differences. Their view is that differences are due more to role than sex. Meta-analysis of social behaviors and intellectual skills has led these scholars to claim that "no [fundamental] difference" exists between females and males.

The "disadvantage, not difference" argument grants that there may be some sex differences, but if they exist, they are often magnified and made into justifications for inequality. To advocates of this position, a primary goal is to identify the social factors involved that amplify differences and interpret them as inadequacies, that is, how traits and behaviors attributed to women acquire the social meaning of deficits (Riger 396-399). An example of this was mentioned earlier in the introduction to this thesis. Although women’s work as librarians is technological in nature, because it is considered “women’s work” female librarians are not paid as much as men nor given the same status as men in IT professions.
While Riger’s argument is more contemporary, the nature versus nurture argument has been ensuing for the last century. Canada and Brusca indicate that “[a] brief review of historical trends in the computing field, as well as data from research demonstrating equally high achievement levels for males and females in technological domains, provides strong support for the argument that the technological gender gap is not biologically predetermined” (46).

In 1903 Dr. James McKeen Cattell, a professor at Columbia University and editor of Science, and colleague, Edward Thorndike argued that biological differences between the sexes explained the scarcity of extremely intelligent women. After giving individuals a series of tests and charting them, Thorndike and others concluded that women’s intelligence scores have less variance than men’s. According to their interpretation, the distribution of women's scores show a majority of the population scoring around the mean. The distribution of men's scores show more variance than those of women; hence, the number of men on the high end of the distribution account for the gender imbalance at the highest intelligence level. However, by extension, men’s scores also account for the lowest scores.

In 1952 Simone de Beauvoir published The Second Sex which was the first book by a woman to truly question these perceived biological differences between women and men. Although de Beauvoir’s book was castigated because the author lacked any scientific training, her book is still widely respected fifty years later. Furthermore, her book laid a foundation for later scientific query into biological differences between women and men by such researchers as Anne Fausto-Sterling.
Until Fausto-Sterling's book *Myths of Gender: Biological Theories About Women and Men* (1985), psychologists maintained that only their arguments were scientifically based, while condemning objections from the social scientists. However, Fausto-Sterling’s book investigated biological, evolutionary, psychological and genetic evidence and discovered a lack of substance behind ideas concerning intelligence levels based on sex difference. While remaining sensitive to the fact that biology of the sexes is a complex subject, she purported that her book was a scientific statement *and* a political statement. It could not be otherwise. Where I differ from some of those I take to task is in not denying my politics. Scientists who do deny their politics - who claim to be objective and unemotional about gender while living in a world where even boats and automobiles are identified by sex - are fooling themselves and the public at large (12).

Fausto-Sterling gained scientific authority from her training in the hard sciences as a biologist and her arguments were well founded from both feminist and scientific approaches. Fausto-Sterling drew heavily on the earlier work of Maccoby and Jacklin (1974) who were pioneers in questioning and accounting for differences between female and male abilities. Furthermore, she followed in the footsteps of another scientist, Evelyn Fox Keller, who questioned the idea of the masculine domain of "objective" science in her book *Reflections on Gender and Science* (1985). In a more recent article, Fausto-Sterling attacked the mass media for portraying biological differences among women and men in both covert and open ways. She showed, for example, three cover stories from 1994-1996 in popular magazines which conveyed that infidelity and sexual desire are "in our genes" and that using social means to engineer behavioral change probably won't work ("Beyond Difference" 233-235).
Marianne van den Wijngaard summed up the significance of the aforementioned feminist biologists' work in her book *Reinventing the Sexes* (1997):

Their work meant that feminist scholars saw scientific discourses about sex no longer as mere representations of nature, or as facts resulting from value-free investigations; scholars recognized that the results of scientific experiments were subject to sociocultural interpretations and assessments in which women traditionally had little impact compared to men (1).

Other writers, for example Hubbard (1990) and Sayers (1982) examine biology's influence on the sexes in terms of labor discrimination and prescribed social roles. Thus the nature versus nurture argument has been addressed from a number of different perspectives.

While debate has been taking place regarding biological determinism of the sexes since the 1900s, research suggests that what minute neuro-biological differences may exist between women's and men's brains would not contribute to such substantial gender gaps existing in information technology-related tasks. Furthermore, socialization cannot be discounted in any case because it begins almost immediately after birth as indicated previously.

**Education and Gender Gaps**

Since research suggests that gender gaps are not a result of biological differences between the sexes, it becomes necessary to look at potential external factors. For example, since formal education outside the home is something that almost everyone in our society is exposed to at one point, it follows that one factor to consider might be information technology's role in education and on our students today.
Access to information is surely more widespread than it ever has been. According to the *Digest of Educational Statistics 1997*, ninety per cent of public elementary and secondary schools have microcomputers and seventy-six per cent of private schools have microcomputers (459). But is this only widening the gap between girls and boys? The American Association of University Women's 1998 report *Gender Gaps: Where Schools Still Fail Our Children* maintains that while girls are "catching up" to boys in math and science test scores, they are still lagging behind in terms of chances for future employment in technologically related fields. Why and how is this happening?

Educators across the country are beginning to notice that while boys and girls do equally well in computer classes in school, boys are usually the ones who are enthusiastic enough about computers to play with them after school. Boys are often the students who sign up for computer electives in high school. Young men are frequently the majority of those who enroll in computer science courses in college (Sanders 31).

Both Cardman (117) and Sanders provide statistical evidence that demonstrate that this imbalance in enthusiasm prevails across computer clubs, camps and classes. Currently, girls only comprise fifteen per cent of the number of after-school computer users (*Teaching the Majority* 147-148).

Some research indicates that while both girls and boys are required to take the same number of computer literacy classes in schools, boys will then choose to continue taking computer classes such as graphics and programming. Collis' study of 3,000 young adults' attitudes towards computers revealed that young women's attitudes and/or self-confidence towards computers does not improve as a result of coursework. In fact, these young women tended to adopt the attitude that computers were for boys. The study also revealed that while they supported the notion that young women as a whole were just as
competent as young men when using computers, they were not as confident about their own individual abilities to use computers (207).

One explanation in support of these findings is given by Hanson, a researcher at the Education Development Center. Hanson cites a 1991 Michigan State Board of Education survey which demonstrated that adolescents have a very clear understanding of “gender messages about technology” that are internalized and affect future decisions regarding post-secondary education and employment (11). These messages undermine girls’ self-confidence when using technology and discourage them from future use.

Furthermore, the AAUW’s report contends that girls must be more competitive in computer programming, graphics, and web design skills in order to “achieve economic independence and participate in cutting-edge fields of knowledge” (97). Because young men already have such skills, they are able to take advantage of lucrative opportunities. For instance, The Washington Post reported that young men in high school with such skills are earning up to $50,000.00 per year for three days' work per week (Wee 1). Young women who are not taking computer design and programming classes are not even given employment opportunities comparable to young men. In addition to missing out on such prospects because of their lack of technological skills, young women appear to be staying away from certain professions. The AAUW report indicates that the situation is getting worse as young women enter college:

Rejection of computer technology follows young women as they enter college and potentially makes them avoid computer or technology related fields. In higher education, the statistics are more dramatic. In 1986 women comprised only thirty-six per cent of computer sciences majors; thirty per cent of master’s degree recipients, and thirteen per cent of those receiving Ph.D.s” (20-23).
Most recently, the Digest of Educational Statistics 1997 reports that gender gaps in computer and information science fields are widening. According to 1994-95 data, 17,463 of computer and information science (CIS) bachelor's degrees were obtained by men, while only 6,941 of the degrees were obtained by women. On the master's level, men obtained 7,627 degrees, while women received 2,699 of them. And on the most divided level, 723 men, but only 161 women earned doctor's degrees (272).

Data indicates that trends contributing to IT related gender gaps are beginning in elementary schools and following young women into their college years. Because of attitudes that exist surrounding computer use, young women appear to be avoiding elective computer technology classes and degrees. This is contributing to a substantially larger number of men than women obtaining degrees and jobs in information technology.

**IT and Socio-Cultural Influence**

Though education is a significant factor in contributing to gender gaps that should not be ignored, cultural issues and the attitudes that result from them should be evaluated as well. Hesse-Biber says that "it is not the computer that our students dislike and distrust; rather, the mythical cultural environment surrounding the computer that dehumanizes the machine and emphasizes the technical and tool-like nature of the technology" (22). When referring to the way that women and men are viewed when using computer technology, Coyle maintains that

> [t]he difference isn't in skill but in the social status already assigned to the activity, and we all support this status with our assumptions of the superiority of male activities. What needs to change is not the activities of women and men, but our attitudes toward them (53).
Although women such as Admiral Grace Hopper and Ada Lovelace were instrumental in early computer designs, they are often overlooked in historical textbooks (Coyle 44-45). Women today are still being overlooked. According to the Digest of Educational Statistics 1997, fifty-three per cent of female workers are using computers at work, as opposed to forty per cent of male workers (466). Yet, society still chooses to accept computer science and IT professions as a "masculine" domain because of the cultural myths that surround them. Van Zoonen suggests that women using and designing information technology for office work and "social" work such as librarianship are often overlooked because their technological know-how is discounted by "dint of the gender of the producers" (9).

That computer science and IT professions are masculine is manifested in a number of ways. Men hold a majority of IT related jobs. Strok reports that the most recent data available indicates that women comprise 7.8 percent of computer science and computer engineering faculties (1992). Computer programmers and software developers are usually men. Language surrounding computer hardware is loaded with such masculine imagery as "joysticks" and "RAM" (Coyle 47). Computer trade shows are one of the few professional venues where pornography is active (Coyle 50). Dilevko and Harris' research suggests that men appear in ads for technology products much more frequently than women (722). This study consisted of a sampling of journals drawn from the fields of information and library science, business and management and computer science and engineering. Computer magazines such as Wired are full of advertisements and articles with sex appeal to keep the men coming back for more. Paulina Borsook
examines this phenomena more closely in her article "The Memoirs of a Token: An Aging Berkeley Feminist Examines Wired" (24-41). Borsook tells her story of encounters with the editors and writers of Wired, the changes that are underway because of their old boys' network, and questions what this means for the "girls of technopaganism."

Flores in his article “Information Technology and the Institution of Identity: Reflections Since Understanding Computers and Cognition” uses a theoretical and historical approach in examining the strength of cultural and societal influences in identity formation:

The Hegelian account enables us to see how much our own personal and corporate identities are given to us by the way we are dealt with by others and by the shared practices into which we are socialized. We ceaselessly rediscover who we are by finding out how we are assessed by others and what resources are therefore available to us (1998).

Drawing from the philosophies advanced by Hegel and Kierkegaard, Flores suggests that individual identities are forged by the community and public world in which one is surrounded. These identities can only be transformed through "interpretation, positioning, and unconditional commitment" (1998).

Such positioning of identities can be seen in Foucauldian theory which is grounded in the notion of power/knowledge. Foucault substantiates this by writing that

[w]hat it [power] really does is to entertain the claims to attention of local, discontinuous, disqualified, illegitimate knowledges against the claims of a unitary body of theory which would filter, hierarchise and order them in the name of some true knowledge and some arbitrary idea of what constitutes a science and its objects (83).

The relationship between knowledge from IT and power appears clear. In addition, there is status associated with computers and their technology in the fast moving, fast paced
lifestyle that is always present in the culture surrounding computers. Karen Coyle summarizes this best in *Wired Women* by saying that "[t]o question the masculinity of computers is tantamount to questioning our image of masculinity itself: Computers are power, and power, in our world, must be the realm of men" (43). In the world of technology, the faster your computer operates, the more power you have. The relationship between power and technology is evident within the computer world.

This literature suggests that socio-cultural influences have permeated the information technology domain. Literature confirms that contributions made by women in technology related fields are ignored. Furthermore, the environment surrounding IT is masculine in its orientation and structure.

**Information Technology and Librarianship**

Computer automation in libraries has been increasing since the 1950s when it was first used in engineering libraries. These libraries employed "the Uniterm coordinate indexing techniques of Mortimer Taube on collections of report literature" (Kilgour 219). From this point on, small advancements were made which contributed to the first true searchable database:

The celebrated Medlars system encompassed the first major departure in machine citation searching. The original Medlars had two principal products: 1) composition of *Index Medicus*; and 2) machine searching of a huge file of journal article citations for production of recurrent or on-demand bibliographies. The system became operational in 1964… The next major development was DIALOG, an on-line system for machine subject searching of the NASA report file (Kilgour 220).

The first real mention to the production of a single machine - readable bibliographic record came in 1960 from a report prepared by L.R. Bunnow (Kilgour 220). In five short
years, over a dozen libraries had their own formats. With this in mind, the Library of Congress and the Council on Library Resources set out to create a standardized machine-readable record -- what is now known as MARC format (Kilgour 225).

Concurrently in 1951, a small group of academic librarians began meeting to discuss cooperative arrangements among the small, liberal arts colleges of Ohio (Maciuszko 2). However, it wasn't until 1967 when the first annual meeting of its forty-eight paid members took place that the development of OCLC (Ohio College Library Center, Inc.) truly began. This meeting was responsible for the election of OCLC's Board of Trustees. Maciuszko writes of the significance of OCLC during those formative years of computer automation in academic libraries:

The shared cataloging system would be implemented first because it was the foundation on which the total library system was to be constructed. It would result in the creation of a large data base of bibliographic information recording the holdings of each member library, and was viewed as a way to once and for all eliminate duplicate descriptive cataloging in Ohio academic libraries (18).

These few events are just a small sample of the steps that were instrumental in the use of information technology in libraries that is so prevalent today.

With this increase in technology has come negative consequences as well. Harris' research suggests that there is an image problem regarding technology and female librarians. They are "apparently not seen to be capable of grasping technological complexities nor are they perceived to be up to the job of managing the organization, whether it be in the form of a traditional library or an amalgam of 'information services'" (14). Furthermore, Harris argues that with the increased use of technology, computers in
the workplace will replace an increased number of lower end jobs or tasks within libraries. She labels this "de-skilling."

In contrast, Bearman observed that new technologies will inevitably lead to increased teaching and consulting roles and noted that, 'even with improved front end packages and enhanced expert systems, the proliferation of databases and the rapidly changing technologies will require the help of information professionals to keep up with services, provide expert access to them, and serve as a member of the organization's management planning team knowledgeable about information assets (84).

Meanwhile, librarians utilize complex computer technology everyday to access massive amounts of information in the academic community. Fidishun’s 1996 dissertation revealed that middle-aged and older female librarians are often resistant in computer training and normally don’t retain what they learn in most cases. However, most literature suggests that librarians are now regarded as information teachers for students, faculty and other library users. Pritchard maintains that "librarianship is concerned with the nature of information and recorded expression, the ways people seek and use it, and the processes for selecting, organizing, preserving and retrieving it" (3). All of these three elements now primarily revolve around computer technology. Female librarians recognize this and are coming to view computers as "tools," "aids" and "friends" and not something to be "feared" (Reed 5).

Computer technology has a forty year history in academic librarianship. With the new developments and increasing technology has come many changes. Questions concerning female librarian’s role and IT have arose in the course of these ensuing changes. Though a small study suggests that middle-aged librarians are reluctant to learn
new technology, a broader study indicates that female librarians are, in fact, using
technology successfully in their jobs.

**Feminism and Academic Librarians**

Examining feminism in librarianship can be a difficult task. Because women
since the late 1800s have dominated the profession some would assume that librarianship
is a feminist profession. However, historians maintain that this is not the case. In fact,

Weibel writes that the profession is a feminized one:

> An acceptance and even affinity for bureaucratic and hierarchical structures,
> humanitarian service, rooted in the emotions, task rather than intellectual
> orientation, and compliance are the hallmarks of the feminized professions and
> are the subject of innumerable articles in the literature of librarianship. Whether
> one attributes these characteristics to the dominance of women alone, or not at all,
> or in combination with other factors such as association with the educational,
> cultural, and nonprofit segments of society, these do seem to be the acknowledged
> generalizations about the profession and are voiced both within and outside of
> librarianship (266).

Defining feminism and those that subscribe to its belief systems is also a difficult,
if not impossible, task. During its long history, the feminist movement has had many
different influences. This has contributed to a broad definition of what “feminism” is.

According to Andermahr et al., feminism is

[d]efined in the OED as 'advocacy of the rights of women', dating from the mid-
nineteenth century in Europe. Historically there have been many feminisms,
variously grounded. Minimally, the term implies the identification of women as
systematically oppressed; the belief that gender relations are neither inscribed in
natural differences between the sexes, nor immutable, and a political commitment
to their transformation. Historically, the term emerged as part of the discourse of
the European Enlightenment, and nineteenth-century feminism was deeply
marked by its Western and bourgeois roots. It is this history which has lead some
women's movements to refuse the term (76).
Baum's book Feminist Thought in American Librarianship attempts to define the differences between the two biggest camps in feminism -- liberal or mainstream feminism and radical feminism. While liberal feminists have been and are concerned with access issues of librarianship (gaining access into particular jobs within librarianship and keeping them, having access to child care, maternity leave, etc., but having the choice to come back to their positions, etc.) radical feminists wish to transform the status quo structures that are responsible for denying women access.

Liberal or mainstream feminists' primary concerns are individualism, self-interest and role changing with a strong interest in changing the political agenda. They represent themselves as an interest group by trying to integrate women into the ongoing, political structure or public sphere with its schedule of benefits and awards. Furthermore, liberal feminism has been very popular and well supported because it leaves the status quo mostly intact. It became the "uncontested voice of feminism, thus allowing it to define the political agenda of the women's movement for the public-at-large" (Baum 9). Liberal feminism purports that patriarchal society thinks that women are ideally suited only for certain occupations such as teaching, nursing, social work and librarianship. For almost one hundred years, women have comprised a majority of the workforce in these occupations, yet they've never attained "formal, legitimate authority within them" (Silver 21).

Radical feminism was born out of dissatisfaction with leftist politics of the 1960s and early 1970s. According to Andermahr et al., some of the basic beliefs of radical feminism entail
• that women are oppressed as women and that their oppressors are men. Male power had to be recognized and understood, and was not to be reduced to anything else, for example, the power of capital over labour;
• that the whole gender order in which people, things and behaviour are classified in terms of the distinction between masculine and feminine is socially constructed and has no basis in natural differences between the sexes. A common goal was the annihilation of sex-roles.
• that male oppression has primacy over all other oppressions, for which indeed it provided the template (182).

Radical feminists encourage women to use their individual power from within to reject the "male world" completely. To accomplish this, radical feminists encourage a collective union among women to achieve the desired outcome. They assert that patriarchy is still in control, so much so that it is invisible in most societies around the world. Radical feminism's theoretical strength lies in its profound analysis of the "mythology surrounding gender"(Baum 13). In other words, radical feminism would directly support the critique of gender and technology in librarianship. Consciousness-raising is a technique that radical feminists often employ to share information and female experiences. According to Andermahr et al., consciousness-raising is seen as a "practice which named and placed under the spotlight knowledge that women already had from experience, but which required collective articulation, and the exposure and rejection of an internalized patriarchal ideology"(35).

Baum’s research revolved around a study of monographs, journal articles and conference papers that were pertinent to women's issues in librarianship from 1965-1985. These issues were categorized as either "liberal" or "radical" issues. Liberal issues were defined to include: wage discrimination, sex discrimination, equal opportunity, affirmative action, status of women in librarianship, ERA, gaining access, child care as
related to work, self improvement (self image), career development, intellectual freedom, occupational stereotype, legal status of women, sex segregation, working environment, job satisfaction, occupational segregation, gender gap, and part-time employment (30). Radical issues were defined to include sexist terminology, sexual politics, sexual harassment, homosexuality, individual autonomy, unionization, self-development, and censorship of pornography (47). While it was found that there are several key women who were writing about feminist issues and librarianship, there were only 250 total articles written during this time period that met the criteria for the purposes of this study. Considering that the library profession numbered just over 100,000 during this time and that 80% of this number were women, some might argue that 250 articles written by library women on women's issues over a 21 year cycle is not very significant (Baum 124). How can this low number be explained? Is this indifference by women towards their jobs? Does this signal a lack of concern about authorship by women in the profession? Could this best be explained by the fact that men have generally exerted editorial control over library-related publications? Since it is not clear what percentage of women were encouraged or required to publish during that time frame, it is difficult to understand these findings.

Even without a clearer understanding of why this is the case, the findings seem to suggest apathy within the profession towards women's issues or issues relating to feminism. Weibel confirms this by declaring that

[t]o varying degrees, issues of the women's movement such as child care, role definition, equal pay and opportunity have become concerns of the institutions which define libraries: schools, colleges and universities, business, government, etc., as well as concerns of the constituencies served by these libraries. On the
other hand, libraries have not been noted for their quick institutional response to social movements. Within the profession itself, organized activity on the part of women came a bit later than in other professional or academic groups, including those such as nursing also dominated in number by women. Organized participation in the overall women's movement has not yet developed as a vigorous concern of the profession (263).

Baum's analysis of this literature also indicates that women writing about librarianship and related issues often take a very descriptive approach rather than prescriptive which supports her argument that most women employed in female dominated professions tend toward mainstream liberal feminism. She writes that "[l]ibrary women writing about women in librarianship expend most of their energies describing the status of women in American librarianship, and much less time proposing clear-cut agendas for action" (125). Rather than calling for any change via a course of action, feminized publication usually tells a story of "how things are" in librarianship. This is descriptive in nature, as opposed to prescriptive. Garrison supports this by saying that

the feminization of American librarianship was on the whole unaccompanied by any feminine calls for radical social change. The social roles which women elected to act out did much to shape the development of an important American cultural institution. Until the librarian deals with the implications of feminization with its varied inhibitory effects upon intellectual excellence and leadership, progress toward professionalization will be limited" (1976, 19).

Others such as Grotzinger disagreed with Garrison by maintaining that some women entered into the profession of librarianship to "challenge their capabilities" and satisfy their personal goals and aspirations (195). However, Grotzinger's article discusses historical contributions to the development of librarianship, rather than issues that specifically plague a female-dominated profession.
Although some were quick to criticize feminism within librarianship and respond that there have been no improvements because of it, others such as Pritchard view the negligible impact of feminism on librarianship as a result of too small steps in too few places during a short time. The frustrated attempts to implement change remind us not of the failures of feminism, but of the persistence of patriarchal thought, of the yet-to-be-realized potential of feminism, and of the importance of acting together as a profession to achieve it (77).

Though Pritchard has strong views on feminism in librarianship, she does not use the same binary approach as Baum does. Whereas Baum divides feminist librarians into two frameworks either liberal or radical (i.e. a binary approach), Pritchard sees feminism on a more wholistic level. Pritchard maintains that a feminist analysis centers on "women" or "women's issues" and goes "beyond to the impact of gender relations and gendered conditions of human development in all spheres of thought and action" (1999). Therefore, it would make sense to examine the field of librarianship through a feminist lens since it is encompasses women and women's issue. The first issues examined issues concerned with gaining access into the profession; later, women started tackling bigger issues such as wage discrimination, sex discrimination, child care as related to work, legal status of women and gender gaps. Radical feminist librarians are still discussing sexist terminology in terms of classification systems, sexist politics, sexual harassment, homosexuality, unionization, and censorship of pornography.

Having a "feminist agenda" is not a true representation of what feminist ideology is about, argues Pritchard. Feminists need to recognize myriad issues regarding sex, race, and class that are capable of incorporating librarians from all types of libraries with many levels of experience and knowledge, and from many cultural backgrounds. Only then
will feminist thinking "permanently enlarge our way of looking… in a way that has relevance to us as working professionals and as providers of information"(2). Pritchard's article "Feminist Thinking and Librarianship in the 1990s: Issues and Challenges" asserts that there are five primary issues that female librarians need to address; one of which is technology and information. She maintains that technology is integral to so many facets of librarianship that it cannot be overlooked. Issues of research relating to technology and librarianship are the approaches that women and girls take in learning technology-related skills and the "technological legacy" of a male-originated philosophy of science. These theories will be necessary, maintains Pritchard, as modernistic information systems are implemented in libraries (5).

Though feminist ideology can be applied to many other disciplines, Pritchard points out the uniqueness of pairing information science and feminist analysis:

One might wonder why feminist thought has any greater impact on information and libraries than any other subject. In fact, there is a fundamental connection between the two. Librarianship is concerned with the nature of information and recorded expression, the ways people seek and use it, and the processes for selecting, organizing, preserving and retrieving it. Feminist thought calls into question the values and definitions underlying our very concepts of knowledge, thus questioning the institutions and services we build around those concepts"(3).

Information technology is the key to knowledge in the next millenium. The keepers of knowledge hold the most power in our society. In other words, the societal vision of gender and gender-related labor and skills is skewed and this undermines knowledge as a whole. Because this literature review suggests that cultural and/or societal practices influence IT related education and employment choices, it could be assumed that a feminist framework could assist in re-shaping cultural and societal norms
to re-build a gender free structure. This, in turn, could serve to decrease the gender gap in IT professions. Though many are quick to claim that feminist scholarship is too radical in its approach and unrealistic or even harmful in its implementation, Pritchard makes clear the necessity of feminist evaluations:

Feminist critique of language, categorizations of knowledge, and the scope and construction of intellectual endeavors, is directly relevant to the creation of information, its dissemination, acquisition, and classification. Our thinking about the design and uses of technology, about the publishing and media industries, about the kinds of works that get produced and saved, must take into account an immense body of research on the potential bias inherent in these areas. More than bias against individual women or topics related to women, these systems and assumptions reflect what is high quality, or scientific, or worth studying. Libraries serve as gatekeepers of culture and learning. In selecting some items and ignoring others, in codifying and preserving knowledge, in actively assisting users or passively standing by, libraries control access to, and impose a relational value system on, all forms of information and communication"(3).

Because of the breadth of outreach that information professionals in libraries serve, Pritchard continues to explain that a diverse number of viewpoints provides a plethora of proposed answers-- this "very abundance….ensure[s] that we can adapt them to our particular needs" (6).
METHODOLOGY

As suggested earlier, feminism encompasses a multitude of theoretical and philosophical beliefs. Because of this, it is possible to evaluate gender gaps in IT from a number of differing perspectives within feminist theory such as ageism, essentialism, Marxist feminism, moral reasoning, phallocentrism, post-structuralism, psychoanalysis, queer theory, standpoint epistemology or womanism. However, for the purpose of this research on gender gaps and IT in academic libraries, Marxist feminism, poststructuralism and feminist standpoint epistemology will constitute the framework from which to explore the research question.

Marxist Feminist Analysis

A Marxist Feminist evaluation of IT related gender gaps is primarily rooted in two concepts -- money and power. Jorgensen-Soelberg suggests that at the early stages of computer and information technology development, women were valuable contributors and that it was not until military use of IT escalated that a cash value was assigned to it and the women were first overlooked, and then forgotten (1). Griffiths, an education researcher, claims that "[i]t appears that an activity becomes 'technology' when there is money to be made from it, or power to be gained by the exercise of it" (147). Van Zoonen provides an excellent description of the production of technology and gender constructs:

[T]o arrive at a cultural understanding of gender and technology it is necessary to put the constructed nature of technology in the front of the analysis. Partly, the point was made earlier when discussing the social economic content in which technology is produced. It was said that technology is a product of social relations and reflects patriarchal ideas and values. As a result technology is assumed to possess all kinds of relatively invariant qualities such as rationality,
efficiency and masculinity. But the nature of technology cannot be seen as the inevitable outcome of its production context only. Other contexts are equally relevant in establishing the meaning of concrete technological products and practices (22-23).

Furthermore, Bush distinguishes three other contexts within which technology operates: the user context in which tissues such as the immediate personal advantage created by the use of technology are relevant; the environmental context, i.e. the ecological impact of accepting the technology versus the impact of continuing current techniques; and the cultural context in which the effect of technology on gender, the social system and the organization of communities is discussed (165).

According to Marxist theory, women and men are produced through economics that, in turn, controls all. Information science is an example of yet another profession that despite its “strength in numbers” cannot move beyond the confines of materialist and patriarchal notions. Marxist theory has grown in scope, as new interpretations, critiques and theories have arisen from the original theory. A unique and distinguishing feature of materialist theory is that feminists can take one of two very different approaches to it. The first is that of the socialist feminist school which is “critical of capitalism and Marxism, so much so that avoidance of Marxism’s alleged reductionism resulted in dual systems theories postulating various forms of interaction between capitalism and patriarchy” (Switala 1998). Marxist feminism, on the other hand, chooses a more positive criticism by evaluating Marxist theories in order to discern the capitalist sources that serve to construct women as oppressed subjects.

John Storey in An Introduction to Cultural Theory and Popular Culture explains the basic tenants of Marxist theory. Storey points out that what makes the Marxist methodology different from other ‘historical’ approaches to culture is the Marxist conception of history. Marx argues that each significant
period in history is constructed around a particular ‘mode of production;’ that is, the way in which a society is organized (i.e. slave, feudal, capitalist) to produce the necessaries of life: food, shelter, etc. Each mode of production produces different ways of obtaining the necessaries of life, but it also produces different relationships between ‘workers’ and ‘non-workers,’ and different social institutions (including cultural ones). At the heart of this analysis is the claim that how a society produces its means of existence (its particular mode of production) ultimately determines the political, social and cultural shape of that society and its possible future development. This claim is based on a revolutionary understanding of the relationship between base and superstructure. (101-102)

Information technology represents a particular mode of production - the production of information and hence, knowledge - and forms the base structure. Other aspects which grow out of the economic structure affect the surrounding culture. This is evident by the way IT and its masculine domain have influenced education, advertising and socio-cultural attitudes surrounding technology.

On a theoretical level, relations of production deal with the class structures of the people involved in the production itself. Superstructure then takes into account the establishment of and ‘social consciousness’ that results from cultural, religious, political, legal, and philosophical notions about the mode of production. Education and socio-cultural influences fall into the category of superstructure. Storey maintains that the association between base and superstructure has two dynamics -- it can be seen as a “mechanical relationship of cause and effect” with the superstructure following the activities of the base. The second component of this relationship is of establishing boundaries of what could possibly occur within the realms of the base and superstructure. Not every theorist who studies Marxism agrees with this twofold relationship, however.

Louis Althusser’s ideas about culture continue to have an impact on the study of Marxist theory. Althusserian theory draws from Marxist theory and adds that social
formation consists of economic, ideological and political applications. Instead of viewing
the relationship between base and superstructure as resonating, Althusser believes that the
base relies on the superstructure for its existence. In addition to this analysis, Althusser
had some groundbreaking theories regarding ideology as an independent concept. He
viewed ideology as a necessary tool for making sense of the world around us and as a
means by which we participate in our own oppression. According to A Concise Glossary
of Feminist Theory, “Althusser’s theses are that ideology represents the imaginary
relationship of individuals to their real conditions of existence.... and the individual
human subject is produced in a subjection that appears to be freely chosen, but which
matches the individual to the place which she or he is destined to occupy in society
within the parameters of class, gender and ‘race.’”(Andermahr et al. 105)

There are several ways of interpreting Marxism to understand the gender gaps in
the field of information science. Marx and Engels in their germinal Communist
Manifesto (1848) begin with the following sentence: “The history of all hitherto existing
society is the history of class struggles.”(79) Though class struggles do not exist in
librarianship, similar struggles, i.e. gender struggles, do. Though men have always been
a part of library science, women have dominated the profession in terms of numbers since
the late 1800s. However, ironically the bigger names in the world of librarianship in the
early years, were men, such as Melville Dewey who was responsible for creating the
Dewey Decimal Classification. Andrew Carnegie is yet another example of how the
influence of a man (particularly a man with money) in a library environment can serve to
influence the growth and future issues in the profession. The focus on men’s
contributions in the field, rather than an all-inclusive focus, mimics the class struggles that Marx and Engels write about. Furthermore, Andermahr et al. write that “patriarchal, or gender ideology is understood as a cultural ordering in which gender differences present themselves as utterly natural, founded upon biologically given differences of sex”(105). Some would contend that there are certain tasks that women cannot effectively perform as efficiently as men, thereby allowing for a patriarchal division of labor within a particular profession. Some question whether the use of computer automation in the field of information science is increasing the number of men in the field while also serving to widen the gender gap. However, within this profession, there are no differences (particularly biological in nature that would prohibit women from performing the same job as a man) in a library atmosphere. Besides increasing the number of men in librarianship, the use of IT in libraries by women has been discounted as indicated by unequal pay and lack of acknowledgment of female librarians as information technologists. Under this guise, differences in salaries between men and women are being justified because of technological know-how. However, female/male differences appear to be a false dichotomy upon which incorrect assumptions are based.

Another outcome of this dichotomy is the binary division between professions that are “masculine” in nature (i.e. “hard” sciences including computer science) versus those that are “feminine” (humanities, social sciences and library science). This leads one to question where these dichotomies originated. Are they necessary? Monique Wittig maintains that they are not. Her materialist feminist approach adheres to the notion that Marxist theory prohibits women from identifying themselves as a class and
naturalizes the sexual division of labor (444). Furthermore, she contends that "categorization of 'woman' and 'man' are political in nature, not natural" (439). This further supports the notion that socio-cultural factors play a far greater role than realized in the construction of "gender" identity.

These Marxist ideals help to explain how the separation of gender remains a part of information science. A Marxist feminist perspective allows librarians to see the ways in which patriarchal structures dictate social apparatuses including libraries. Of course this affects the people who work and use them as well. As exemplified by feminist scholars such as Wittig (discussed above), one can see that there are alternatives to the traditional structures of patriarchy that only serve to perpetuate these gender gaps.

Poststructuralist Analysis

The idea of binary oppositions leads us into a discussion of poststructuralism. Lévi-Strauss wrote of them in terms of myths creating meaning “by dividing the world into such mutually exclusive categories.” (Storey 77) In doing so, he borrows from Ferdinand de Saussure. Both Saussure and Lévi-Strauss believed that meaning was derived from a transmission between the concepts of same and different. One should understand what a “child” is in order for one to grasp the concept of an “adult.” Saussure’s semiology laid the groundwork for structuralism and poststructuralism by positing that the notion of sign was composed of signifier and signified, and that an arbitrary relationship exists between the first two components. In terms of its relationship to IT, Jansen suggests that

[even a cursory review of the scholarly literature on technology reveals that constitution of the terms 'woman' and 'technology' are not separate practices; they
are related terms in a vocabulary of power-relations that defines the objects men make and manipulate and the work they do as 'technical'; conversely, this vocabulary treats the objects women make and manipulate and the work they do as 'nontechnical,' 'natural,' sometimes even 'nurturing,' 'humane,' or 'humanistic.' This practice is also, of course, congruent with theoretical conventions in economics, sociology, and history, which consider men's paid labor as productive and part of a nation's economy, and women's unpaid labor as reproductive and outside calculations of gross national products (196-197).

One of the difficulties in doing this analysis is that none of these threads are singular in their outlooks. All of them have discourses and critiques that need to be taken into account. This is especially true in poststructural theory. Storey acknowledges this by stating that “their [poststructural theorists’] work is often very different, and at times very difficult. What unites them is the influence of Saussure, and the use of a particular vocabulary drawn from his work.”(73) Furthermore, Andermahr et al. maintain that “the term [poststructuralism] designates not a single approach, but a range of overlapping positions...”(171) Despite the overlap, there are certain tenets that poststructuralists adhere to such as postulating that the relationship of the signifier, signified, and the sign is more elaborate than what Saussure acknowledges. Meaning is a much more fluid and unstable concept with the signifiers not producing signifieds, but more signifiers.

What impact does this have for information professionals? The first great libraries of Alexandria were maintained by men. All of the “great” philosophers were men. Within society, men have always been viewed as the “keepers of knowledge.” The concept of men as keepers of knowledge perpetuates the myth of women being less educable and less educated than men -- that women’s work no matter how “equal” it may be with men’s is still at a lower echelon because they are not and cannot be keepers of knowledge. The concepts of knowledge and technology in and of themselves are
constructed as part of a masculine framework, relating back to the dichotomies of masculine/feminine and hard sciences/soft sciences. As already discussed, technology falls under the hard sciences and is a male dominated profession. However, while the number of men far exceeds the number of women in the fields of management information science and computer science, the opposite is true in information and library science. 1990 Census Bureau statistics indicate that there are approximately 2.5 men for every woman working in MIS and computer science, while there are almost 4 women for every man in information and library science (Government Information Sharing Project 1990). Though there are some obvious differences between the two fields of study, it is interesting to note that many (not all) information professionals have many (not all) of the same kinds of computing and technology skills as the MIS and computer science graduates. Ironically, however, MIS and computer science salaries average $41,838, whereas a librarian's average salary is $26,499 (Government Information Sharing Project).

Foucault uses notions of power and discourse to examine how language use and culture interact and their “dialogical” relationship with one another. Through an analysis of discourse, Foucault delimits the conversations surrounding potential subject matters. Men have traditionally held on to power through knowledge and defined knowledge through power which is the case in library and information science. Jansen expounds upon this by writing that "[t]echnologies are extensions of structures of power and capital as well as derivatives of scientific discourses. Women and men in Western cultures have, of course, been differentially situated in relation to structures of wealth and power" (209).
Enter into this equation the fact that computer technology is a major tool of information science and this lends itself to a unique position for women in the field. It’s time for women to utilize the resources and cohesiveness that they are building in order to develop a solid theoretical framework to deconstruct the masculine fortress that surrounds libraries today. As discussed in the beginning of this paper, men have remained “in control” or in the places of power within librarianship. Exerting their influence through knowledge and/or money, this shows evidence that “power is a strategic terrain, the site of an unequal relationship between the powerful and the powerless...” (Storey 97)

**Feminist Standpoint Epistemologist Analysis**

Libraries represent vast amounts of information accessible through many different media. What is frequently overlooked is that the “classic texts of Western history, philosophy, literature, religion, and science, riddled with misinformation about women” that are housed within the library’s walls are still viewed as “sacred truths” (Hawkesworth 538). This needs to be changed on a fundamental level and simply introducing Women’s Studies texts does not solve the problem. Instead, female librarians need to work at changing their own way(s) of thinking which will then spill over to their work at all levels. Librarians are at a crucial point to potentially break down dominant paradigms that exist and are evident in libraries; not only through the information that the library houses, but the policies that they have in regards to censorship and intellectual freedom. The staff at the institution can play an important role in determining the structure and make-up of the library. For example, power structures that are so prevalent in libraries continue to be perpetuated because men occupy higher-paying administrative-
level positions. Standpoint epistemologists' position is a collective grouping of feminist epistemologies which privilege women's ways of knowing above others. Rather than arising inevitably from the experience of women, which is recognized to be extremely diverse, feminist standpoints are consciously chosen political and social vantage points available to men as well as women. Harding suggests that feminists adopt the starting point of women in circumstances very different from their own, in order to get outside their own experiential limitations. Such attempts to strengthen feminist standpoint by objectivizing its perspective make it impossible to argue that feminist epistemology rejects objectivity; rather it redefines objectivity through specifically feminist justificatory epistemic strategies (Andermahr et al. 211).

While it has been argued that a feminist analysis of librarianship which questions the existing male-dominated paradigm, could be just as destructive, Hawkesworth justifies feminist standpoint as a theoretical framework which benefits all of society and not just the dominate class:

Based on a consistent belief in and acceptance of fallibility as inescapable and consonant with life in a world of contingencies, feminists need not claim universal, ahistorical validity for their analyses. They need not assert that theirs is the only or the final word on complex questions. In the absence of claims of universal validity, feminist accounts derive their justificatory force from their capacity to illuminate existing social relations, to demonstrate the deficiencies of alternative interpretations, to debunk opposing views. Precisely because feminists move beyond texts to confront the work, they can provide concrete reasons in specific contexts for the superiority of their accounts. Such claims to superiority are derived not from some privileged standpoint of the feminist knower nor from the putative merits of particular intuitions but from the strength of rational argument, from the ability to demonstrate point by point the deficiencies of alternative explanations. At their best, feminist analyses engage both the critical intellect and the work; they surpass androcentric accounts because in their systematicity more is examined and less is assumed (557).

Though it could be assumed that librarianship is often dominated by female knowledge because of the large number of women in the profession, the male hierarchical structures mentioned before prevent this from being the case. Advocating feminist
standpoint epistemology in evaluating librarianship is not advocating a women-only point-of-view, but as Spivey in his article, "Feminist Scholarship: Implications for Information Management and Research" writes, it actually increases the overall view of a wider variety of persons both working in and using the library:

Given the emphasis on social diversity in these views, information studies would benefit from an infusion of standpoint epistemology. It can be argued that feminist scholarship should be of interest to information management, because women are a majority of non-management personnel in libraries. However the deeper significance of feminist scholarship, as represented by standpoint epistemology, is its liberating and socially responsible challenge to information management and research. Standpoint epistemologists encourage information policies and studies, which develop out of social diversity, and address the information needs of less privileged persons (160-161).

Social diversity is present in the library user population as well as the profession itself. However, diversity within any system is not always easy to deal with. For example, how do we reconcile and account for the diversity of women who claim their identities as “feminist” or even as non-feminist within the profession, but still try to achieve equal rights for librarians? bell hooks [sic] tackled this very difficult and often sensitive issue by creating a dialogue between women of color and non and labeling it marginalization. Historically, librarians have been of the white, middle-class variety closely similar to Betty Friedan’s brand of housewife that went to work. A We/they [sic] dichotomy exists within this type of feminism to which a female librarian subscribes - liberal or radical - which further separates women in the profession, rather than fostering alliance. Perhaps if female librarians understood what standpoint epistemology could offer them, they would be more apt to appreciate it. Hawkesworth substantiates this by writing that “[t]he recognition that epistemological assumptions have political
implications stimulates efforts to attain theoretical self-consciousness concerning the intellectual presuppositions of feminist analysis” (534).

The political level is not the only level that can be affected. As discussed in chapter 2.3, socio-cultural influences can contribute to the very formation of ideas on many levels. Hawkesworth alludes to this by claiming that “[a]cquisition of knowledge occurs in the context of socialization and enculturation to determinate traditions that provide the conceptual frameworks through which the world is viewed” (549).

Feminist standpoint epistemology would create more opportunities for librarians to evaluate their jobs, behaviors and decisions from a diverse perspective. It would provide librarians with the situation to open dialogue concerning the use of the term “feminist” within the profession. And it would help to dispel the myths that perpetuate a false conceptualization of knowledge. Hawkesworth's closing sentence in her article "Knowers, Knowing, Known: Feminist Theory and Claims of Truth" provides a powerful reminder of what standpoint epistemology can do. She writes that "[I]n confrontations with power, knowledge and rational argumentation alone will not secure victory, but feminists can use them strategically to subvert male dominance and to transform oppressive institutions and practices” (557).
CONCLUSIONS

The literature reviewed in this thesis suggests that there are discernable gender gaps that can be related to an increased use of information technology. By examining this phenomena from a feminist perspective, a clearer historical and contemporary understanding can be reached. Although gender gaps have plagued librarianship since women entered into the profession, there were reasons, although later disproved, for women making less money than men (e.g. women were not believed to be as intelligent as men) and why they were not being promoted to administrative positions (e.g. women were too nurturing to be effective managers). However, feminist analysis has challenged and disproved such notions as the research in this thesis indicates.

Literature from five areas of research was analyzed to contribute to this thesis. These areas are biology and gender; education and technology; information technology and socio-cultural influences; information technology and librarians; and feminism and academic libraries. An analysis of biology and gender was necessary to preclude essentialist explanations of gender gaps. Though it was believed in the early 1900s that men were innately more intelligent than women, Fausto-Sterling and other feminist biologists have worked to disprove this falsehood.

Next to biological influences, the impact of education and technology seems to be most significant in explaining gender gaps. Since statistics show that a large majority of children in this culture are exposed to information technology at school and sometimes at home, the influence is not surprising. What is surprising is that despite the fact that girls and boys have equal access to computers, girls are still lagging behind in their interest
and use of computers. Furthermore, this is discouraging young women from entering information technology related professions which could have dire consequences for our future labor market which will need women to fill such positions.

Besides the educational institutions themselves, socio-cultural influences impact not only how children but women and men perceive computers and related jobs. Messages from parents, teachers, peers, colleagues, and advertising all assist in creating myths surrounding information technology and the people who work with it.

One such group that is often overlooked is librarians. A historical overview of computer automation and information technology brings into perspective how long computers have been used in libraries. And in recent years IT is increasing in terms of accessibility around the world. With the increase come questions regarding the advantages of IT in libraries since gender gaps are one of the disadvantages being overlooked.

Although there is no doubt that technology has provided many opportunities for library users, there is concern over how it is influencing the profession. Will more gender gaps arise between female and male librarians? More research is needed to answer this question.

In the last section, feminism and academic libraries were examined. A historical analysis was provided with a comparison to what may be happening to feminism in the profession. Librarianship is redefining itself with jobs like systems positions. This presents a critical opportunity to redefine thinking. By changing its professional thinking, librarianship can begin to change its professional status. Questions regarding
whether librarianship is losing its library qualities only to be replaced by high-tech
information qualities leave some professionals torn over the future of defining its
profession. Not only could a feminist analysis bring a more diverse framework for
scholarship within librarianship, it could also assist in the production of new research
within the profession.

As discussed earlier, information technology use in libraries has only increased in
the last forty years. Starting out slowly in the beginning, technology is often difficult to
keep up with on a weekly basis now. What does this mean for librarians? Although there
is much conjecture, some anticipate that the increased technology will draw more men
into the field while discouraging women. However, as of yet, there is no data suggesting
a dramatic change in the number of women entering information and/or library science
programs. If the population make-up does not change, will the salaries between tech or
systems librarians reveal another gender gap? These are important trends that need to be
examined and will be discussed further in chapter five.

Although this thesis discusses the idea of division within the profession over the
“feminist” label, the author maintains that incorporating feminist dialogue and discourse
into the profession would be beneficial to all. The hierarchical structures that have been
in place have prevented anything but a male point of view. Rather than presage a radical
feminist take-over which is what is often feared when feminism or feminists are brought
into open discussion, feminist theory would incorporate a more inclusive dialogue as
Hawkesworth indicates in chapter three, benefiting all members of the community.
RECOMMENDATIONS

Conducting a theoretical (feminist) analysis of gender gaps and information technology lends itself to many avenues of explorations. First and foremost, the author agrees with the recommendation of Corbin in her thesis *Gender Differences in the Library Computing Specialty* (1992) that more original data needs to be collected within the profession. Statistics are needed to effectively evaluate the underlying causes and impact of gender gaps in librarianship. There is no doubt that gaps exist, but there is a need to examine if the number of women entering the profession is changing as a result.

During the course of research, the least amount of literature was found on the effects of technology on librarians themselves and not the libraries as institution. Although there is a published dissertation by Fidishun (1996) on the effects of computer technology on twelve middle-aged women in academic libraries, a much larger representative sample needs to be gathered and evaluated.

Another proposed study could specifically target systems and systems-related librarian positions. Although the American Librarian Association Office for Library Personel Resources releases a report every five years called *Academic and Public Librarians: Data by Race, Ethnicity and Sex* (1991), the data that was needed for this thesis was not included. This is an excellent starting point for statistical information about the general make-up of librarians, but it does not categorize librarians by the types of departments in which they work or the job tasks they perform. This data is needed to evaluate systems librarian positions. There is some belief that systems positions are attracting more men into the field of librarianship. Does this mean a concomitant rise in
salaries? Without specific data on systems librarians, it is very difficult to reach any conclusions.

**Desired Outcomes/Impacts**

Why is all of this important? Since librarianship is one of the few female dominated professions, it's a potential hot bed for feminist exploration, particularly because of its long and diverse history. Though many female librarians claim to be "feminists," they are often liberal feminists who think that the few advances that women have made in terms of labor/work force-related issues are enough. The time has come for female librarians to embrace feminist theory and action in order to make substantial changes in their profession. It is important to evaluate such trends so that women stay interested and keep entering into the field of librarianship. Perhaps if more professors offered courses such as Hope Olson's "Feminism and Library and Information Studies" (see http://www.ualberta.ca/~holson/589/outline.htm), more women and men would be encouraged by feminist thought. If men are creating their own niche within librarianship via systems jobs, then females may feel continually discouraged from entering into such higher paying jobs within librarianship and possibly breaking down the gap between female and male academic librarians.

Encouraging feminist thinking is also a means of granting agency to many librarians who may have thought that their jobs were simply “good enough.” By encouraging sisterhood within the profession, techniques such as consciousness raising could assist women in addressing issues that are causing gender gaps and allowing them to continue even as we approach the millenium.
Works Cited


Canada, Katherine and Frank Brusca. “The Technological Gender Gap: Evidence and
Recommendations for Educators and Computer-Based Instruction Designers.”


Corbin, Roberta A. Gender Differences in the Library Computing Specialty. Thesis.


Eagly, A.H. Sex Differences in Social Behavior: A Social-Role Interpretation.


Maccoby, Eleanor and Carol Nagy Jacklin. The Psychology of Sex Differences.


Rosser, Sue V., ed. Teaching the Majority: Breaking the Gender Barrier in Science,


