

**Power Relations in IT Education and Work:
The Intersectionality of Gender, Race and Class**

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Journal of Information, Communication and Ethics in Society
Special Issue on ICTs and Social Inclusion

Abstract

Social exclusion as a result of gender, race and class inequality is perhaps one of the most pressing challenges associated with the development of a diverse information technology (IT) workforce. Women remain under represented in the information technology (IT) workforce and college majors that prepare students for IT careers. Research on the under representation of women in IT typically assumes women to be homogeneous in nature, something that blinds the research to variation that exists among women. For instance, how might the experiences of women of color differ from those of their White female colleagues? How do women of color negotiate the intersecting challenges associated with being under represented in terms of both race and gender? In this study we challenge the assumption of heterogeneity by investigating how the intersection of gender, race and class identities shape the experiences of Black female IT workers and learners in the U.S. The results of this meta-analysis offers new ways of theorizing that provide nuanced understanding of social exclusion and varied emancipatory practices in reaction to shared group exposure to oppression.

Keywords

Class, digital divide, e-inclusion, feminist research, gender, gender and IT, information technology workforce, intersectionality, race, social exclusion, social inclusion

Acknowledgements

This research has been funded by grants from the National Science Foundation (NSF 0204246, NSF 0733747). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

1. Introduction

Social exclusion as a result of gender, race and class inequality is a persistent challenge to the development of a diverse information technology (IT) workforce. A study by the Information Technology Association of America (ITAA, 2005) found that under-represented minorities and women made few inroads into high tech employment between 1996 and 2004, based on an analysis of data from the U.S. Bureau of Labor Statistics (BLS) *Current Population Surveys*. The percentage of women in the overall IT workforce fell from 41% to 32.4% between 1996 and 2004, and the percentage of Blacks in the overall IT workforce fell from 9.1% to 8.3% during the same period. As a result, the theme of social exclusion and inclusion has been receiving an increasing amount of attention in the scholarly literature.¹ Kvasny (2006) contends that to address social exclusion and ICT, we must first acknowledge diverse social identities and how they are situated in power relations. Gender, race, ethnicity, socio-economic status, and sexuality constitute identity markers that are central to women's lived experiences, playing a crucial role in determining their politics and ideologies, their location in the workforce, and their sense of identity. Poor women, lesbians, and women of color face a "system of interlocking inequalities and oppressions" (hooks, 1989). Hence they may find little in the essentialist² notion of 'womanhood' that fits their experiences with and perceptions about IT and work.

In this paper, we explore how the intersection of gender, race and class identities shape the experiences of Black female IT workers and learners in the U.S. In doing so, we investigate the tensions between shared group exposure to White male patriarchy and varied within group reaction to it. We use interviews from two groups of Black women -- those employed as IT professionals and those taking their first IT courses at a community technology center -- to allow for comparison, contrast and critical analysis. The objective of this meta-analysis of the interview data is to develop nuanced ways of theorizing that provide a better understanding of the subtleties of social exclusion and, hence, inform a wider range of possible interventions.

We begin by listening to the voices of women who relate stories of oppression and emancipation as they endeavor to prepare for and participate in the information age. We then discuss two gender theories about difference: standpoint theory and the individual differences theory of gender and IT. Finally, we apply these theoretical perspectives to interpret the stories about covert and overt exclusion and the varied sources of emancipation. In keeping with the focus on the intersectionality of gender, race and class, we also explain how we draw upon our own standpoints to interpret these narratives.

¹ For an example of a conference devoted to this topic, see Trauth and Howcroft (2006b) and for an example of a special issue of a journal devoted to this topic, see Cushman and McLean (2008).

² Essentialism means speaking of types of things as if they have an essence or nature. This usually is taken to mean generalizing about the nature of a certain type of human being (e.g., "Women are better listeners than men"), or about human nature (e.g., "We are all motivated by self-concern"). Essentialist positions on gender consider traits such as caring and nurturing to be fixed based on women's biology or psychology, and traits such as assertive and logical to be fixed based on men's biology or psychology while not allowing for variations among individual women and men or over time.

The women's stories that are used in this paper come from two field studies of gender and IT. The first author conducted an ethnographic investigation in 2001 of staff and adult participants at a community technology center. The entire staff, the classroom facilitators and all participants are Black. The study focused on a single cohort of 12 participants and a classroom facilitator who were observed over two seven-week courses. This fieldwork consisted of informal interviews and participant observation in the classroom. The interview process was based on natural opportunities for conversation before and after class. Each interview averaged 30 minutes in length and was not recorded because the researcher had repeated access to each participant. Thus, follow-up interviews could be used to clarify and deepen the researcher's understanding. Participants were asked questions about their computer activities and skills, their observations on the learning experience, their motivations for coming to the technology centers, the challenges they faced, and the benefits they hoped to gain from this experience. These interview questions were not developed *a priori*, but were developed as the researcher learned more about the participants' lives and experiences. This informal interview approach is typically used for locating key informants in ethnographic research (Bernard, 1995). In this paper we focus on the eight women participants in that study.

The second author conducted an interview-based field study between 2002 and 2006 of the gender shaping of women in the American IT labor force. Life history interviews, lasting, on average, 90 minutes in length were conducted with 123 female IT professionals. During the interviews each woman was asked to describe her introduction to IT, her educational experiences, her decision to enter the IT profession, her experiences as a woman working in a male-dominated profession, and people and events who influenced her personal and professional development. Purposive sampling techniques were used in order to recruit women who represent a range of geographical locations, ages, demographic backgrounds, educational backgrounds, levels of management and job classifications, relationship statuses and family compositions. In this paper, we focus on the ten Black women (8%) among the respondents. Transcripts of the tape-recorded interviews were coded using a coding scheme developed in an open coding fashion based, in part, on the interview guide.³ The third author participated in some of the interviews and engaged in transcribing, coding and analyzing the transcripts. Interview data are supplemented by data from participant observation and from published materials about the geographic regions in the study.

The research presented here adopts a critical epistemology, something that is particularly appropriate for a study of gender, race and class that is focused on examining barriers that help to explain the under-representation of women of color in the IT field. The use of critical epistemology for gender research (Trauth and Howcroft, 2006a) and for gender and race research (Kvasny, 2007) is already documented in the IT literature. The recent growth of critical research is consistent with the growing recognition of the organizational and societal contexts in the study of IT development, deployment and use.

³ Additional details about the coding scheme can be found in Trauth, Quesenberry and Morgan (2004).

This recognition, in turn, leads to considerations of social and political power (Howcroft and Trauth, 2005; Kvasny and Richardson, 2006).

Critical research challenges the view that science and research are neutral and objective. Women represent culturally diverse groups who produce knowledge that answers their questions about their place in society. However, as authors like Harding (1988) point out, the subject of knowledge claims has historically been an idealized agent (male, Western, highly educated, financially established) who performs the ‘god trick’ of speaking authoritatively about everything in the world from no particular location or human perspective at all. The problem is not one of biased individuals, or ‘bad science’. Rather, the problem, we argue, is with the conceptual frameworks which often promote interests and concerns of dominant groups and may in fact be counter to dominated people’s needs and desires. Dominant frameworks ensure systemic ignorance about the lives of the oppressed and the lives of their oppressors, and thus about power relations.

Thus, in the face of sexist, racist, and bourgeois hegemony, the argument continues, critical research that focuses on the lived experiences of the oppressed becomes a powerful resource for revealing the ideological strategies used to justify systems of oppression and for producing insights into the strategies women use for ending their oppression. We support this argument by invoking the voices of the two groups of Black women: low-income women taking introductory IT courses at a community technology center as well as mid- and high-income women working in both academic and professional IT organizations. By selecting both IT learners and workers we are able to construct a broader understanding of how gender, race, and class interact to shape the women’s standpoints on IT.

In conducting our critical interpretations we also draw upon our own standpoints with respect to this research topic. In doing so, we present this work as *feminist gender research* in the information systems field (Trauth, Kvasny and Greenhill, 2007). The first author, a Black female, spent most of her youth living in low income communities in metro New York City. As an undergraduate, she attended both an historically Black university and a small private college. Upon graduation, she worked as an IT professional in large telecommunication companies. Later she earned her doctorate and began a second career in the academy. She learned to meet the demands of higher education and corporate America only by suppressing many of her primary experiences and cultural acquisitions such as Black vernacular speech and hairstyles. She often thinks about her social trajectory and the ways that it has caused her to cross through varied social milieus. This border crossing provides an objective and subjective externality, an otherness. She experiences the subtle and not so subtle forms of gender, class and racial inequality that can’t but make one perceptive. Otherness also nurtures a vigilance when she is conducting research into ‘her people’s’ issues.

The second author is a White female who grew up in the American Midwest (Ohio) as the middle child in a traditional, middle class family of seven sisters, all of whom attended an all female secondary school. She lives as an adult in a same sex household. The trajectory of her life provides lived experience of rejecting categorically assigned

gender roles. And she knows from personal experience the influence of role models and mentors on a person's development. Through observation of her older sisters' educational decisions what was internalized as 'normal' for her was to pursue post-secondary and post-graduate education. Her theoretical interest in gender and IT derives from her own experiences of the social shaping of gender and builds upon a long research career investigating socio-cultural influences on the development of a global IT labor force through the voices of those participating in it. She was drawn to the theme of social inclusion in the IT sector, and gender in particular, because of her own lived experiences and observations of it.

The third author is a Black female who grew up outside Washington, D.C. in one of the wealthiest, majority-African American counties in the U.S. She attended a technology and science secondary school and a historically Black university⁴. This university is not only predominantly Black, it is also predominately female. These experiences influenced her to believe that educational and career options in the IT field were within reach for Black women. She and her sister were raised by her single mother, a professional woman and Guyanese immigrant, from whom she witnessed female independence and achievement. She also experienced an African American culture at school and in the community, and a very traditional Caribbean influence at home. Awareness of her multiple identities as a Black female with Caribbean heritage has fueled her interest in technology and the intersection of differences. She believes that information technology can be a source of empowerment to underserved communities when the context and content are relevant to the lived experiences of the users.

2. Voices of Oppression and Emancipation

The 18 women whose voices are critically analyzed in this paper live and work in three different geographical regions of the United States. One of the women lives in the Northeast region of the country (Boston, Massachusetts metro area). This region of the east coast is one of the wealthiest in the United States based, in large part, upon its long-established information economy (Saxenian, 1996). It is also a thriving hub of higher education -- with universities such as Harvard and MIT -- that attracts young college students and early career professionals. The high cost of living in the region generally requires two-income families. It is also ethnically diverse and is among the most liberal in the country. It was the first state to legalize same-sex marriage and it is commonplace to see women occupying a range of management positions in companies and universities.

Two women in this study live in the Mid Atlantic region of the USA (small towns in rural central Pennsylvania). Rural Pennsylvania has a cost of living that is less than half of that in eastern Massachusetts. Hence, the economic necessity for a two-income family is not as strong. Further, there are often limited employment opportunities for two-career professional couples in the towns and small cities in this rural region. Hence, many women do not work outside the home and those who do are often under employed. There is no IT industry sector in the region, only IT positions in companies in other sectors such

⁴ There is a special designation given to those institutions of higher education whose populations have historically been predominantly Black: Historically Black Colleges and Universities (HBCU).

as food processing, agriculture, manufacturing, extraction, financial services and education (Trauth, Wardell and Yeo, 2005). As a result, there are a limited number of women in the paid labor force who are in visible professional IT positions, and even fewer in leadership positions in those firms. The Appalachian Mountain range that runs through this region dominates not only the geography but also its culture. In contrast to eastern Massachusetts which experiences continuous population changes, this is one of the more conservative regions in the United States with little population in-migration.

The remaining 15 of the women live in the Southern part of the USA (six live in Charlotte/Research Triangle, North Carolina, one lives in New Orleans, Louisiana, and eight live in Atlanta, Georgia). Intertwined in the history, economy, policies and culture of these states is the legacy of slavery and the battle for civil rights.⁵ Like eastern Massachusetts, the Charlotte and Research Triangle regions of North Carolina are part of a growing information economy. This shift to knowledge-intensive work is part of an overall transition from an economy previously based on agriculture and manufacturing. Charlotte is the largest city in the state and a significant financial center. Similarly, the engine of the Research Triangle Park area of the state is an academic one: three universities that more than 100 companies leverage for research output. This economic change from the 'Old South' to the 'New South' is being accompanied by significant cultural changes that affect the understanding of race and femininity, and subsequent views of a woman's life opportunities (Kratt, 2001). This is due, in part, to the cultural mix brought by population in migration from other parts of the country.

The interview that was conducted in Louisiana was in 2004, a year before hurricane Katrina devastated the city of New Orleans. At the time of this interview, New Orleans was a major city of the 'Deep South' at the southernmost end of the Mississippi River that dissects the U.S. Home to the Mardi Gras festival as well as the major U.S. Port of New Orleans, the critical aspect of its geography is that approximately 49% of the region is below sea level. The economy of Louisiana is largely based on agriculture, tourism and the arts, which is, in part, a function of the subtropical climate. The resource-intensive industries in Louisiana continue to be sustaining elements of the state's economy, though they will not likely be the source of new jobs or increased income (LEAN, 2007). The city of New Orleans has always contained a rich cultural mix, with its residents being of Native American, French, Spanish, English, Irish, and German decent. As of 2007, approximately 60% of the population of the city was African American (U.S. Census Bureau, 2007).

The third southern region in this study is Atlanta, Georgia. It is the largest and capital city of the state. According to the 2000 census (US Census Bureau, 2000) the majority of Atlanta residents (61.4% or 255,689) are African American. Atlanta is the major commercial and transportation hub of the southeast United States, and its international

⁵ As this paper was being revised Barack Obama was elected the first Black President of the United States. Thus, we authors note that our comments in this paper about the changing race relations in our country now take on added poignancy.

airport is one of the busiest in the world. According to the AeA's⁶ 2008 report on trends in high-tech employment, Atlanta is ranked as the Southeast's first and America's tenth largest 'cybercity'. Atlanta is also ranked third nationwide in employment in both the software publishers and telecommunication sectors, eighth in engineering services employment and second in the Southeast for hi-tech wages (Whitley, 2008).

The community technology center where the interviews took place is located in Summerhill. This section of Atlanta has 4320 residents, 94% of whom are African American. Nearly 70% of the 1780 households have incomes below \$25,000 and 45% (1044 of the 2,299 adults) have less than a high school education. Roughly 35% of male and 47% of the female adults are employed, while 10% of males and 2% of females are unemployed. The remainder (55% males and 51% females) are neither active in the labor force nor actively seeking employment (Kvasny, 2000).

These three regions of the US were chosen because of the geographic, economic and cultural contrasts that they provide. The women living in Massachusetts, Pennsylvania, North Carolina and Louisiana are professional class women in the IT labor force; those living in Georgia are working class IT learners. The following table summarizes the contextual information about these female respondents.

Name⁷	Age⁸	Job Title	Location of Interview	Year of Interview	Socio-Economic Class (Background)
Cynthia	21	Program Analyst	Massachusetts	2004	Middle Class –mother was a nurse; father was a musician/music minister.
Kirsten	26	Information Technology Specialist	Pennsylvania	2006	Upper/Middle Class – mother was a military officer' father was a musician
Olivia	32	Assistant Professor	Pennsylvania	2006	Working Class/Poor –mother and father worked in maintenance; divorced when she was growing up
Allison	46	Project manager	North Carolina	2003	Working Class –mother was a dressmaker; father was a machinist
Joanne	32	Software Engineer	North Carolina	2003	Working Class –mother and father were factory workers.
June	34	Business Desktop Consultant	North Carolina	2004	Middle Class –mother was an insurance investor; father was an employee at a telecommunications company

⁶ AeA, formerly known as the American Electronics Association, is the nation's largest technology trade association representing all segments of the high-technology industry.

⁷ In the Georgia study, participants often used the informal title "Miss" as a term of respect in the South. In contrast, all women in the second study used first names.

⁸ Age is approximated for the women in the Georgia study. Actual age is used for women in the second study.

Megan	34	Application Analyst	North Carolina	2004	Working Class/Poor – stay at home mother; father was a factory worker.
Peggy	23	System Developer	North Carolina	2003	Middle Class –mother was a certified public accountant; father was a package delivery worker
Melissa	42	Manager of Outsourcing Business Development	North Carolina	2004	Middle Class – mother was a lab technician; father was an accounting supervisor
Lydia	54	Assistant Professor	Louisiana	2004	Working Class/Poor – mother was a housewife; father is deceased
Miss Jones	35	Homemaker	Georgia	2001	Poor: mother on public assistance seeking data entry or secretarial job
Miss Williams	25	Receptionist	Georgia	2001	Working class: seeking IT skills for a job promotion
Miss Marshall	65	Retired	Georgia	2001	Poor: living on social security
Miss Powell	35	Homemaker	Georgia	2001	Poor: mother on public assistance
Miss Green	65	Retired	Georgia	2001	Poor: living on social security
Miss Johnson	65	Retired	Georgia	2001	Poor: living on social security
Miss Scott	35	Cashier	Georgia	2001	Working class: Underemployed working at a concession stand
Miss Smith	50	Unemployed bookkeeper	Georgia	2001	Poor: unemployed but seeking bookkeeping job

A meta-analysis of data from both studies followed an approach documented in the literature for analysis across different data sets (Kvasny & Trauth, 2002). The authors jointly conducted a cross-case comparison, coding interview transcripts using the three high level categories of oppression, emancipation and intersectionality. While meta-analysis limits the ability to uncover more nuanced themes that arose in each context, it does enhance our ability to draw broader implications for the design of tailored interventions.

2.1 Forms of Oppression

The women in both studies experienced a variety of forms of covert oppression. These include: low expectations, differential career guidance, negative stereotypes about their intellectual ability, and negative assumptions about their personal life. And despite the rhetoric of diversity that abounds in human resource departments, they also experienced overt oppression in the forms of: being subjected to a higher bar of achievement than White males in their work cohort, subtle exclusion and open hostility.

2.1.1 Covert oppression

Middle class women who held career positions in the IT workforce recounted experiences of being subjected to negative stereotypes based on race, class and gender. For instance Melissa, who was an honors student in secondary school, encountered the assumption in college that she wasn't as capable as her fellow students.

...So you're in physics class, and people are choosing lab partners and you're the last one picked because you're Black and they assume that you're an idiot, and this was in ... physics 21, which was the most failed class for engineers at [my college]. It's a four-credit course, I got an A-. And I remember the first exam, the average -- it was a 125 point exam-- and the average was 68. And so they were passing the exams around, and I got a 103, so the highest grade in the class. And the shock on the White students' faces when they saw, because they literally assumed that I was an idiot. [Melissa]

Joanne's educational journey shows how oppression occurs through the intersectionality of gender, race and class. She was in honors courses throughout secondary school and graduated fourth in her class. But while the top three students (all males) went directly to four-year universities, she was directed to a two-year, non baccalaureate institution and was advised not to apply for a scholarship.

I was told I might do better at a smaller college but I would not do well at the big name colleges like University of North Carolina, Duke University, those types of colleges. But that I might do well at a two-year college or something like that... [Joanne]

Joanne's experiences in job interviews reveals how the intersection of gender and race produces negative stereotypes about Black women as 'that single parent element' (Kendell, 1999) who are thought to have immoral and deviant lifestyles.

...part of the perception is that they automatically assume that Black women are probably single with kids. So that's another problem as far as the different things you have to go through. You're not considered to be stable because you don't have a man at home... And those types of things are not really said, they're kind of implied...I don't get into what kinds of benefits I'm looking for, insurance for the entire family. None of those discussions come up until after the job interview is posted and been accepted and then I will say, "Well what kinds of medical insurance?" things like that. [Joanne]

2.1.2 Overt oppression

Women in both studies spoke of overt oppression. Megan provided examples from her own career to illustrate how the intersectionality of race and gender influence stereotypes about non-performers at work.

[R]ecently on another team I was on, we hired two new people, one was a young African American female, and one was a White male. And the Black female was

much sharper and dependable, and this White male was kind of lackadaisical. But I think they tolerated that laziness a lot more with him, because he was a young White male versus how long they would have tolerated that with anyone else. Whether it be a White female, a Black female, or a Black male, they tolerated it a lot more with him.

So how does it make you feel? [Interviewer]

It makes you feel angry. You get angry, because, I'm like, "They babied him a little bit more, and hoping he would come around." and I think if it had been anyone else, you know, if it were a White female, "She's just so emotional and weak." And then if it would have been a Black female, "Oh, she's just lazy." Or if it would have been a Black male, "Oh, he's just angry and defiant." But White male? No. [Megan]

Melissa felt that, prior to attending university, she was sheltered from race. In elementary and lower division secondary schools she studied with a mix of White and Black friends. In her specialized upper division, math-science secondary school in New York City, most of her friends were White but she was never really conscious of her race. So it was not until she enrolled in a university in Pennsylvania that she experienced significant negative racial stereotypes and hostility.

I got accepted at Columbia and Cornell essentially based on my grades and SAT⁹ scores, but I did not get enough financial aid to be able to afford to go to either one of those schools and [where I went] was my 'safety school' only because I didn't know much about it. It's actually an excellent engineering school... [A]nd what I found was there were a lot of White people who were killing to get there, and assumed I was there because, they assumed that I grew up in some crack den somewhere because I'm from Brooklyn, NY. And Brooklyn is a very diverse borough, and my neighborhood was more like the Huxtables,¹⁰ so I probably grew up more sheltered than most of them, so they assumed that I was there because of affirmative action, and it was just the most hostile racial environment that I've every been in in my life. I do not have fond memories of college, I do not go back. I don't contribute. I contribute to my high school and if my son ever said he was interested in [this college], I'd say, "Over my dead body!" That's how strongly I disliked the experience there. I was called the 'N word' for the first time there. I was physically assaulted by a woman in my dorm. I was ridiculed by the boyfriend of a girl in my hall. You know, the guys in a car called me the 'N word' from their car driving on campus. And I was just not used to that even though I went to schools that were predominantly White. [Melissa]

The low-income women in Georgia experienced the irony of oppression by institutions that were designed to assist them. Miss Williams, a receptionist, was asked to give

⁹ University entrance examination.

¹⁰ Reference to *The Cosby Show*, a popular television show in the 1990s featuring the actor, Bill Cosby, as Heathcliff Huxtable, the father of an upper middle class Black family.

testimony at a city council meeting about the value of the training that she received at a community technology center. As she did so she revealed how her socio-economic class afforded her an inferior education. It was not until she reached adulthood that she experienced an adequate education and high quality equipment in a nicely furnished building.

I am a native of this city growing up in the public school system. During all those years, I never had a new book or any new equipment. Now I am learning with top-of-the-line equipment in nice buildings with great teachers. It would be wrong for ya'll [the City Council] to give us a toy, something we enjoy, and then snatch it away. [Miss Williams]

Class status was also demonstrated in Miss Marshall's complaint about broken equipment at the community technology center.

What can be done to better the computer in this class so that we can know the basics of this computer? I think the first day there was a problem something should have been done to correct it. We know the program is free so that means that we have to put up with [anything], if so why? We want the best [Miss Marshall].

Miss Marshall's negative educational experiences mirrored those of Miss Williams. This IT training was seen as providing requisite job skills that she could leverage in the labor market. IT was viewed as a mechanism for escaping poverty, and broken equipment limited her ability to realize this strategy.

2.2 Sources of Emancipation

In response to these sources of oppression, the women drew upon both personal and institutional sources of emancipation. Interwoven in their career and life histories are stories about escape from oppression and empowerment through IT.

2.2.1 Personal agency

The women IT professionals in our study were unusual in the population of IT professionals in that, as a group, they were among the top students in their secondary school graduating classes.

Allison did well at the A levels (the final exam in the British system) so she was able to go to university. She was the first person in her family to do so.

Cynthia was in the top five percent in her secondary school which was extremely competitive.

Joanne, Lydia and Peggy were in honors course throughout secondary school

June was enrolled in an academically gifted program from elementary school through secondary school. She excelled at math and science, and was one of the top students.

Kirsten was the president or chair of every one of the organizations in which she participated during secondary school where she also studied a number of advanced placement (honors) courses.

Megan graduated fifth out of a class of 1700 students in secondary school. She was also the highest ranking African American student in her class.

Melissa was in gifted classes from elementary through lower division secondary school and attended a secondary school whose admission was based on academic excellence. She skipped the eighth grade. She was accepted to prestigious universities including Columbia and Cornell.

We find it noteworthy that recruitment criteria for this study did not include measures of intellect or academic achievement. According to Bourdieu (1990), our professional IT women are 'over selected' – the few outsiders who are among the highest achieving and academically talented in their group. These women are not the inheritors of valued positions in society; their families did not pass on a legacy of privilege. Rather, it was the educational system that enabled their upward social mobility. However, educational systems see to it that only the most competent Black women and other under-represented groups make their way through the system.

The women spoke, as a matter of course, about the need to do more than their White, male counterparts in order to be seen as qualified. It forced women such as Melissa to work even harder and without adequate mentoring.

... I was running an early support program for one of [my firm's] pieces of hardware, and it was kind of a big deal at that age to be running this kind of program, and the customer was [name of company], which at the time was the largest customer in the branch, one of the largest in the country; they were a leading edge IT shop. We were having hardware problems because of a bug in the software, and it was a high exposure thing, because it was causing issues at the account. And so [my firm] darkened the skies with all engineers to figure out what the problem was, and they stayed a week. And they determined what the problem was, and I followed them around to understand what was going on, and I was part of a team of SEs [systems engineers] that supported the account. Of course I was the only female. I was the only Black, and the lead SE was an older crotchety White guy and we were going into a meeting with all of the [client] team, about this issue, and I said to him. I said "[His name], do you think I'm going to be called upon to explain what the issue was and what the resolution was and kind of give more technical background on it?" And he said, "Oh, that probably won't come up." And I think he said it knowing that it probably would come up, hoping for me to fall on my face. And I'm convinced that that was his

plan. But I thought, "That doesn't make any sense. Of course that would be what they would be interested in doing." So I made sure. I met with the engineers and made sure I totally understood what the issue was, and I went into that meeting, and it came up, and I nailed it. I mean, I just was articulate. I knew the details, understood what had happened, and their jaws were hanging open, especially this guy, expecting that I was going to fall on my face, and I actually wound up getting a branch manager's award as a result of how I handled that situation, in spite of him. [Melissa]

For the women in Georgia, technology was seen as an important asset that would facilitate social and economic advancement. Miss Scott described a direct linkage from IT skills to employment.

I am attending the computer applications class at the Cyber Center. I will learn a lot of computer applications when I finish this class. I will be able to get a better job and better opportunities. I will conquer the digital divide. We all need to learn these computer applications. We will need this information to be successful in the business world. Afro-Americans have basically been left behind in this arena. We must make progress. The Cyber Center will help us to accomplish this mission. [Miss Scott]

Miss Johnson, in an appeal to the City Council, described the importance of the neighborhood technology center for improving her self worth.

I want to make sure that you understand how important this program is. It is giving me a new lease on life. It increases my thoughts, and my ability to learn. The environment is very encouraging. I now have faith and hope. Now I understand that there are things out there for us, as we get old. I would like to start a web business. The Cyber Centers fill a great need. We seniors are now becoming 'qualified homebodies'. We can fill these jobs. [Miss Johnson]

Another form of personal agency was revealed in social activism about gender and racial oppression that has been a feature of the late twentieth century American landscape. Melissa was the only woman in either study to take part in formal activist politics. She became angry while at university about the racism she experienced. This led to her becoming active in the Black student union.

The other women engaged in informal activism. When Megan was invited to participate in this study she explained her need to "get things off her chest," to be able to talk freely about her work without wearing her "game face."

... "Ooh that sounds interesting!" That was my immediate thought. And then I thought that would give me an opportunity for me to get some things off my chest. I don't have [a chance] to talk about this everyday. ... And the fact that sometimes I say, "You have to put on your game face when you ride in the elevator, especially at this company. I was surprised one day when I rode up in the

elevator, and there were three African American women and one Black man in the elevator. And we all made a comment about it, because it was just like, because usually if you walk around and you ride in the elevator, you're going to be on the elevator with a White male, you know, and so it's something you need sometimes to vent and talk about that. [Megan]

Miss Powell saw technology as empowering. She described dire economic implications for Blacks lacking IT skills in the job market, and implored those African Americans with IT skills to teach others in the community.

I cannot simply express the gratitude I have for the mayor and the staff that are primarily responsible for giving me an opportunity to obtain the computer skills that have now become almost necessary to obtain many entry-level jobs in today's job market. I'd like to offer my support and prayers that this program will remain intact for our future generations. There is definitely a digital divide in the area of technology when it comes to African Americans mainly because many people cannot afford to obtain their own personal computers, and access to computer training have not been prevalent in our communities. Additionally, our older generations tend to feel intimidated by computer technology. It has become the responsibility of those who have the ability to train and provide others with computer skills to do so in a comfortable setting. [Miss Powell]

2.2.2 Institutional agency

The women also found a consistent source of empowerment in formal institutions such as the predominantly Black colleges that they attended. Some, because of their age, had little other choice.¹¹ Others chose historically Black colleges for the moral support they found there before having to confront the 'real world' of racial discrimination.

...I said [to myself], "Well, I realize I don't know a lot about the African American culture except for my growing up. I want to know more about the African American culture, I want to be in a little bit more relaxed environment at least for four more years until I have to get out into the real world and deal with the discrimination." [Megan]

Affirmative Action policies have served as a double-edged sword for these women. On the one hand, the policies provided the impetus for corporate recruiters to come to historically Black colleges and enabled Black women to be considered for positions that would otherwise have been reserved for White men. On the other hand, Affirmative Action has been a shadow hanging over them that diminishes their achievement. These women commented on the meaning often ascribed to affirmative action: hiring unqualified people so that a diversity box on some form can be checked. Consequently

¹¹ The racial integration of American institutions of higher education had 'officially' begun by the time all of these women were entering college. But while attending a racially integrated university was *legally* possible, what was *practically* possible for some of the women, (given their cultural context), especially the older women from the South, was to attend an all Black college.

when these women achieve something, they often wonder: “Is it because of affirmative action rather than my capabilities?”

Peggy experiences the negative side of Affirmative Action policies. She had internships in which she felt that she was only there so that the company could satisfy some diversity requirement. For example, her equal opportunity scholarship from a prestigious government agency included a summer internship.

So they were trying to bring Black people into [this agency]. Well basically they give us jobs for the summer, and we sit there [to learn] what they do. So you know, equal opportunity. [But] I spent the whole summer doing absolutely nothing. [Peggy]

Whether the female IT professionals came from a middle class or a working class family, they received a consistent message of empowerment from their families. A refrain that echoes through the interview transcripts is the women being told they can do anything they want. In some cases, the parents were professionals who expected the same level of achievement from their children. In other cases, working-class parents empowered their children to achieve more than they did. Some of the empowerment took the form of advanced planning for discrimination in their lives. Megan said about her parents:

...they made us aware of a lot of things that kind of prepared us. My parents had us in their mid to late 30s. So, they would tell us stories of Martin Luther King and civil rights...My Mom was 34 when she had me, so I was born in 1970, so they had lived through sit-ins and having to ride in the back of the bus and different restaurants and using a different bathroom, and as a part of growing up, they made us [aware] that this is our history and that made us stronger. [Megan]

Faith based organizations were also a source of empowerment. Megan stated that the minister of her Baptist church was an activist.

...Um, don't take this the wrong way.¹² We were told, “A lot of Whites don't want to see you succeed, and you're going to meet discrimination and racism. And you need to stand up for what you believe in.” We would march on Martin Luther King Day before there was a Martin Luther King Day early on. I remember we would march from our church to the site where we wanted to have Martin Luther King Drive. I mean, we were, when I was young, I was probably 11 or 12 doing that. [This minister] was one of the first African Americans on the city council back home, and so there were a lot of firsts and they were noteworthy then. A lot of firsts. [Megan]

Older women in Georgia described how technology centers gave them a place to be, and something constructive to do with their bodies and minds. A community space evolved as women escaped the isolation of their apartments and learned together at the technology centers.

¹² Comment made to the interviewer who is White.

I come to the center to socialize. I live alone, so my time at the center lets me mingle with others. I need to constantly stimulate my mind or I might go crazy. I don't want to be old and alone with no one to talk to like some of my friends. There are ladies in my building who don't get out much and they just deteriorate in body and mind. Plus, the program is free. This is what really makes me come because I am on a fixed income. Black people don't take advantage of programs like Whites do. That's part of the reason why we are being left behind [Miss Green]

3. Theorizing Intersectionality

“Since critics first alleged that feminism claimed to speak universally for all women, feminist researchers have been acutely aware of the limitations of gender as a single analytical category... [I]ntersectionality is the most important theoretical contribution that women’s studies... has made so far.” (McCall, 2005, 1771).

Intersectionality has evolved over the past 20 years in response to the ‘invisibility’ of Black women in the feminist movement, thereby, problematizing the notion of ‘sisterhood’ and challenging the implicit assumption that there exists a commonality of interests and goals across all women (Anthias and Yuval-Davis, 1983). It serves as a means to conceptualize the interconnections of race, gender and class as they relate to difference and inequality in feminist debates (Gressgård, 2008; Knapp, 2005). It has been applied to ways of theorizing the marginalization of women of color in society (Jordan-Zachery, 2007) and to add nuance to social class by considering how it is influenced by gender, race and sexuality (Brah and Phoenix, 2004). Intersectionality represents a clear acknowledgement of differences among women (Davis, 2008).

But while feminist scholarship may have for a long time acknowledged differences among women, the gender and IS literature has not. We believe that an examination of women’s varied identity characteristics and varied relationships to IT - as novice learners, low-skilled workers, and experienced professionals - is more nuanced than what much of the gender and IT literature would suggest. That is, we acknowledge that women can be regarded as a group with respect to their collective subjugation in power relations that structure society. According to Narayan (1989) women have historically been excluded from prestigious areas of human activity such as technology and science. And when women are included, their contributions have been misrepresented as marginal or inferior to that of men. However, we also note that women do not all experience gender subjugation in a singular way. Black women in America stand at the intersection of race and gender, not fitting entirely into either category. When the topic is race, the focus is typically on *Black men*; when gender is being considered, the focus shifts to *White women* (Hull, Scott, & Smith, 1982). Therefore, in order to interpret Black women’s stories of oppression and emancipation in a way that enabled us to explore the effects of women’s varied identities and experiences, we sought to examine the tensions between women’s shared group exposure to oppression and within group reaction to this exposure.

In this way, we extend intersectionality by theorizing race, gender and class in the context of yet another dimension: participation in the IT field. We do this by employing two theories of difference: a generalized feminist theory – feminist standpoint theory – and an emergent feminist theory specific to the IT field – the individual differences theory of gender and IT.

3.1 Feminist Standpoint Theory

Feminist standpoint theory provides a systematic approach to theorizing the complexities of women's lived contexts, experiences and perspectives (Haraway, 1988). Harding (2004) describes standpoint theory as “an organic epistemology, methodology, and social theory that can arise whenever oppressed peoples gain public voice. The social order looks different from the perspective of our lives and our struggles” (p. 3). The feminist standpoint assumes a critical epistemological position that looks to subordinate groups for expression of both their subjugation and emancipatory values based upon their experiences and knowledges (Adam & Richardson, 2001). It is rooted in the power/knowledge framework that focuses on collective experiences and histories.

Feminist standpoint theory stresses the difference between the individual and the group as units of analysis. Groups who share common positions in social hierarchies will tend to have common experiences, and are therefore predisposed to interpret these experiences similarly. While there is room for individual agency, standpoint theories are concerned with the continued saliency of group location and power. Power relations emerge from long-standing patterns of gender, racial and socio-economic inequality. These power relations give feminist standpoint theory “its *raison d'être*, its continuing salience, and its ability to explain social inequality” (Collins, 1997 p. 376). A crowd of individuals sharing in individual choices does not make a group. Rather, groups have shared histories based upon common experiences in relation to power hierarchies, and these common experiences lend a particular kind of sense making to a social group (Collins, 2000).

The concept of intersectionality was developed by feminists of color to analyze the ways in which women's daily lives are shaped by interlocking power relations such as androcentrism, Eurocentrism, colonialism, and classism (hooks, 1981). Intersectionality has evolved into a central concept in feminist standpoint theory for explicating ways in which group-based oppression imposes substantive differences in the lives of women. From this perspective, nationality, race, class, gender, ethnicity, age and sexuality are not individual markers of identity; rather they are elements of social structures that foster inequality resulting in groups, their position in society, and their accompanying standpoints (Collins, 1997). However, proximity on a single marker of identity such as gender or race does not imply solidarity because individuals have differences on other variables. Collins (1997) notes, for instance, an increasing mismatch between what privileged Black women identify as important themes and what disadvantaged Black women deem as worthy of attention. As a result, it is more accurate to talk about a Black *woman's* standpoint rather than Black *women's* standpoint.

Feminist standpoint theory takes the position that all knowledge is socially situated and that no point exists from which to objectively evaluate the merits of other standpoints. They make the claim that what has usually been taken to be legitimate knowledge has been based primarily on the lives of men in dominant races, classes, and cultures (Allen, 1996). Dominant knowledge claims often position women and other marginalized groups as outsiders who could be best understood by examining how they are different in relation to dominant groups. An example of this is the fact that the vast majority of research on gender in the IT field is positioned as “gender differences” research, that is, research into how women in IT deviate from is taken to be the (male) norm. The creation and legitimization of knowledge claims are key components in the maintenance of power systems (Collins, 2000).

To start outside of these dominant conceptual frameworks and to understand women as agents with their own thoughts, histories and experiences, feminist standpoint theorists use women’s everyday lives as the foundation for constructing oppositional knowledge and emancipatory practice (Smith, 1987). Unseen aspects of the dominant social structures are revealed as women speak from and about their reality. In fact, the act of speaking can serve as a consciousness raising experience from which acts of resistance and empowerment can emerge (Collins, 1998; hooks, 1989).

3.2 Individual Differences Theory of Gender and IT

While women are typically treated as a homogenous group in gender and IT research, intersectionality presents the theoretical argument for examining within group variation with respect to how women are exposed to, experience and respond to the generalized, group-level exercise of power. Trauth is developing such a theoretical articulation of within group variation among women with respect to their relationship to IT. This theory -- the Individual Differences Theory of Gender and IT -- focuses on within-gender variation in response to societal-level gender influences (Trauth, 2002; Trauth & Quesenberry, 2005, 2006, 2007). It is concerned with understanding why some women persist in the IT field in the face of systemic gender biases in both education and the workplace while others do not. The premise of this theory is that the answer lies in the variation that exists among women as a function of the combined influence of endogenous and exogenous factors that influence an individual’s personal development and subsequent IT career decisions (Trauth, Quesenberry, & Morgan, 2004). That is, while all females in a particular society may be exposed to similar messages and biases about gender roles and IT, both the interpretation of these experiences and the response to them will vary as a result of individual factors. Thus, the Individual Differences Theory of Gender and IT searches for the causes of gender under-representation by examining the factors that account for the varied ways that individuals internalize and respond to societal messages and biases. It seeks to understand the sources of personal agency that enable some women to overcome systemic negative influences while others surrender to it.

According to this theory, an understanding of individual responses to group level societal influences can be obtained from examining a combination of personal characteristics and

environmental influences. Hence, the focus is on differences *within* rather than *between* genders. This theory acknowledges that common social shaping messages are conveyed to subgroups in a culture (e.g. to women by age, race, etc.). But at the same time it also takes into account the varied influence of individual background and critical life events that result in a range of responses to those uniform messages (i.e. not all women of a certain age group respond in the same way to commonly received messages).

The Individual Differences Theory of Gender and IT posits that three general constructs, taken together, explain women's decisions to enter and remain in the IT field. The *individual identity construct* includes both personal demographic items (e.g. age, race, ethnicity, nationality, socio-economic class, and parenting status) and career items (e.g. industry in which one currently does or will work, IT discipline – computer science, information systems and information science – one is studying). The *individual influence construct* includes personal characteristics (e.g. educational background, personality traits and abilities) and personal influences (e.g. mentors, role models, experiences with computing, and other significant life experiences). Finally, the *environmental influence construct* includes cultural attitudes and values (e.g. attitudes about IT, about women in IT, about race/ethnicity) related to the geographic area in which one lives, as well as economic and policy influences in that region/country.

To date, this theory has been applied to several contexts. One is an examination of gendered social networks in the IT workforce (Morgan, Quesenberry and Trauth, 2004). The influence of cultural, economic, infrastructural and policy factors on women's participation in the IT workforce were considered in a set of papers (Trauth, Quesenberry, & Yeo, 2008; Trauth, Quesenberry, & Huang, 2008). In another set of papers, the variation in women's response to work-life balance issues was explored (Quesenberry & Trauth, 2005; Quesenberry, Trauth & Morgan, 2006). Quesenberry and Trauth (2007, 2008) examined variation in career motivations among women IT professionals. Finally, a set of papers considered the role of critical epistemology in gender and IT research (Howcroft and Trauth, 2008; Trauth and Howcroft, 2006a).

4. Interpreting the Intersectionality of Power Relations

In section 2 of this paper we considered the varied ways in which women of color negotiate the intersecting challenges associated with their status as under represented members of the IT field with respect to gender, race and class. In section 3 we introduced two theoretical perspectives that guided our interpretation of these women's stories of oppression and emancipation. In this section we apply these two theoretical perspectives to interpret the role of intersectionality in shaping both experiences of oppression and emancipatory behaviors in response.

As posited by feminist standpoint theory, the women in this study voice the commonality of oppression. Intersectionality, as expressed through interlocking power relations about gender, race and class, was in evidence for the low income IT users as well as the middle class IT professionals. Low income women described overt and covert oppression at the hands of employers and educational institutions

that provided them with inferior resources. For example, because of the economic class that Miss Williams inhabited while growing up, she never experienced new text books or new equipment in school. And although Joanne graduated fourth in her class she was advised to attend a two-year college rather than one of the prestigious four-year institutions toward which the top three students -- who did not possess her combination of race, gender and class -- were directed.

The common group-level experiences of subjugation reveal power relations deriving from longstanding patterns of gender, racial, and socio-economic inequality. They all tell the common story of low expectations and support on the part of peers, schools, teachers, guidance counselors and employers. Peggy relates how her internship employer gave her little meaningful work to do; she felt as though her only role in the company was to fulfill some affirmative action quota. Miss Powell described the severe economic implications of race-based social exclusion from the information age. Megan shared observations about different assessment of work performance for White males than for Black females. Melissa talked about the surprise evidenced by her White classmates when she received the highest grade on a physics exam. These overt and covert forms of oppression on the part of organizational actors that was experienced by these women reveal longstanding negative stereotypes, widely portrayed in a variety of sectors of U.S. society, that contribute to Black women's oppression as a group.

In response and in resistance to these forms of group-level oppression the women drew upon a variety of sources of emancipation. Consistent with standpoint theory, women in both data sets talked about the importance of institutions such as historically Black colleges, affirmative action programs, and faith- and community-based organizations in instilling self-confidence and oppositional knowledge that helped them to overcome oppression and succeed. But as posited by the individual differences theory of gender and IT they also drew upon their individual characteristics and influences in developing responses to oppression. While all the women in this study belonged to the same gender and racial groups there was considerable variation across the women with respect to such demographic factors as socio-economic class, educational attainment, and family background.

Women with low educational attainment and class status had few options to improve their social status. Perhaps this is why they placed such a high value on the emancipatory potential of IT. Women with college education, skills and options could leave a part of the country or a particular job. Others remained in their jobs and sought emancipation through management channels in their firms. There was also variation in family and community influences. Megan, for example, derived individual agency from her parents and her pastor who had been activists during the civil rights movement. She felt 'prepared' by them for the oppression she experienced later on in her life. Many of the women who became IT professionals received messages of empowerment from their families. They came from working and middle class households in which the parents were sometimes IT professionals as well. But those coming from low income households

who attended the community IT center, came from under educated families who were unable to provide such educational support.

A final source of emancipatory variation experienced by the women came from geographic region and attendant cultural influences. Women from the south – North Carolina, Georgia and Louisiana – would have been more likely exposed to overt oppression. This is particularly the case for the middle aged women who grew up during the civil right struggle of the 1960s and 1970s. Hence, their emancipation would have been more overt. Examples would be the ability to sit anywhere on a bus, eat in any restaurant or attend any institution of higher education. On the other hand, women from the north – Pennsylvania and Massachusetts – would have had a different experience. Melissa grew up on New York City, inhabited an integrated world and – until going to university – did not feel much need for emancipation. When she did, during her university years and early employment in Pennsylvania, the oppression was more subtle: low expectations and surprise at achievement, unsupportive co-workers and managers.

Consistent with standpoint theory, we also employed our own standpoint in interpreting the data. The first author believes that living as a “Sister Outsider” is common among Black women in the academy who are rooted in working-class communities. She feels that she never quite fits in at the university, and yet she can’t easily return to her place of origin because she no longer fits in there either. The research with working-class African American women is culturally nourishing but tastes bittersweet. On the one hand, it helps her to stay grounded and to discover more about her history and her culture. On the other hand, it is a painful reminder of how far she has moved away from her roots. This personal experience of otherness heightens her ability to perceive it in others. And her experience of economic emancipation through IT, enables her to relate to this phenomenon in others’ lives.

The second author’s career has been enacted during the period of second wave feminism in the USA. She has witnessed and experienced the gradual recognition that women have the right to pursue any career, including those – such as technology -- traditionally reserved for men. Her own educational and career journeys have progressed from a starting point of limited options for middle class women to a playing field that many would argue is now ‘level’. Nevertheless, she has also witnessed the gap between the rhetoric of gender equality and the reality of gender inequality. These experiences have taught her that while most people in American society say they believe in gender equality, there are many who are not prepared to engage in the difficult tasks of rooting out subtle exclusion. What her life and her research tell her is that women still have to work harder to prove themselves. This standpoint, for example, enabled her to uncover the unexpected finding in her data that the Black women who are IT professionals needed to achieve at an even higher level than men or White women in order to be accepted as competent.

The third author’s connection, at a deeply personal level, to Melissa’s story of moving from New York City to attend a university in Pennsylvania aided in our interpretation and articulation of this theme. Melissa had felt sheltered from racism because of the

multicultural context of her elementary and secondary education. Likewise, she did not internalize gender-based limitations on her technological interests because she attended a specialized mathematics-science secondary school in which it was 'normal' for females to achieve. In a similar way, the third author felt insulated from racism because of growing up in an affluent Black community and enrolling in a predominantly female HBCU for her university education. And she also felt empowered to achieve in the technological realm because of her attendance at a technological secondary school. So it came as a rude awakening for both of them to encounter overt racism.

5. Conclusion

Our analysis on the intersectionality of Black women's experiences in the IT field addresses two theoretical problems associated with a monolithic view of gender. First, a monolithic view does not take into account the effects of other salient identity characteristics such as race and class. In this paper we have shown the ways in which race and class intersect with gender to alter women's exposure to, experience of and response to oppression. Further, we document the range of sources and expressions of emancipation. Second, a monolithic view does not take into account the influence of individual characteristics (such as intellect), individual influences (such as family and educational background) and environmental influences (such as living in an all Black versus a racially integrated community) on the women's exposure to, experience of and response to oppression based on gender, race and class.

These results also have theoretical implications for research on social inclusion and ICT. There is a need, we would argue, to employ feminist theories in studies that consider gender in ICT development, dissemination, use and exclusion. While theories of technology diffusion may also be relevant, such theories, alone, do not sufficiently account for the role of gender relations. Feminist theories enable consideration of the intersecting power relations that produce the oppression that fosters social exclusion (see Kvasny, Greenhill & Trauth, 2005). In addition, theorizing about the under-representation of women in IT requires a full range of research epistemologies. There is a place for positivist studies that serve to document social inclusion and ICT in tangible (and usually quantitative) terms. But there is also a need for interpretivist studies that help us to understand the subjective meanings behind those statistics, and for critical studies that consider the roles that oppression and emancipation play in explaining the under-representation of women in IT.

Beyond the contribution in the form of new ways of theorizing, this research also makes a contribution to practice. Our findings suggest specific avenues for the development of interventions – at the individual, family, community, educational, workplace and political levels – that derive from this more nuanced understanding of social exclusion and the subtleties inherent in achieving real emancipation.

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