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REVISITING CAREER PATH ASSUMPTIONS: THE CASE OF WOMEN IN THE IT WORKFORCE

Completed Research Paper

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Abstract

Many researchers have argued that additional systematic analysis of the information technology (IT) workforce is necessary in order to more deeply understand organizational human behavior as it relates to career anchors or values and motivations that attract an individual to a particular career. For these reasons the purpose of this paper is to examine the career anchors of women in the American IT workforce and their relationships to occupational decisions. The data for this examination comes from interpretive interviews conducted with 92 women and a quantitative survey conducted with an additional 210 women. The results of our analyses give cause for challenging some longstanding assumptions about career anchors that exist in the literature. This research also makes a theoretical contribution through its extension of an emergent theory about within-gender variation to the context of career anchor variations among women in the IT field.

Keywords: career values and motivations, career anchors, diversity, gender, women, IT profession, IT workforce, individual differences theory of gender and IT

Réexaminer les Hypothèses des Déroulements de Carrière: le Cas des Femmes dans le Domaine des Technologies de L'Information

Résumé

Cet article examine les points d'ancrage des carrières des femmes dans le domaine des TI en Amérique, ainsi que leurs liens avec leurs choix d'orientation. 92 femmes ont participé à un entretien interprétatif et 210 femmes supplémentaires ont répondu à un questionnaire. Les résultats remettent en question les hypothèses de la littérature sur les points d'ancrage des carrières.

Introduction

Contemporary organizational researchers are increasingly questioning research models based upon assumptions about career goals that “most employees seek natural progressions upward and [that] they want to work for a single, stable employer” (Marshall and Bonner, 2003, p. 281). Given the current workplace, characterized by complex job arrangements with highly divergent and diverse career paths, researchers are, instead, embracing organizational theories that account for the dynamic nature of today’s workplace and workers (Bonner, 1997; Bridges, 1994). In view of these workforce dynamics, researchers argue that traditional models for investigating organizational, social and cultural influences on careers are increasingly less valid (Bridges, 1994; Hall, 1996; Marshall & Bonner, 2003; Rifkin, 1995). They suggest that this shift is primarily due to recent changes in the definitions of work, careers, and job structure, widespread downsizing, subsequent loss in job security, shifts in organizational loyalties and the increasingly global nature of the labor force.

In this regard, the information technology (IT)¹ workforce has gained particular attention because of the dynamic nature of the work, and the poor recruitment and retention figures particularly among under represented groups. Crepeau et al. (1992) remarks that “studies are required to determine the extent to which the internal career orientations of IS personnel ... match the external career options provided by organizations” (p. 156). Ginzberg and Baroudi (1988) and Ramakrishna and Potosky (2003) also argue that additional systematic analysis of the IT workforce is necessary in order to more deeply understand organizational behavior as it relates to career anchors, or self-perceived patterns of talents, values, needs, abilities, attitudes and the evolved sense of motives that attracted an individual to a particular occupation.

Hence, the purpose of this paper is to examine the career anchors of women in the American IT workforce and their relationships to occupational decisions. We do so by examining the career anchors of women in the American IT workforce and their relationships to occupational decisions. The data consists of interpretive interviews conducted with 92 women and a quantitative survey conducted with an additional 210 women. The paper relates to human behavior in IT for two reasons. First, our analysis focuses on the occupational decisions of women in IT at an individual level. Second, our analysis focuses on the provision of appropriate recruitment and retention programs at an organizational level. Our results challenge some longstanding assumptions about career anchors that exist in the literature.

Literature Review

The concept of a career anchor or career orientation was first introduced by Schein (1971; 1975; 1985; 1987; 1990) who characterized it as “that element of our self-concept that we will not give up, even if forced to make a difficult choice” (Schein, 1987, p. 158). Hence, as previously described, a career anchor was assumed to describe an immutable self-perceived pattern of talents, values, needs, abilities, attitudes, and the evolved sense of motives that attracted an individual to a particular occupation. Schein (1987) identified eight career anchors: *managerial competence*, *technical/functional competence*, *entrepreneurship/creativity*, *autonomy/independence*, *sense of service/dedication*, *pure challenge*, *lifestyle integration* and *security/stability*. DeLong (1982) extended the career anchor discussion by adding *identity* and dividing security/stability into the two independent anchors: *organizational stability* and *geographic stability*. Career anchors as defined by Schein (1987) and DeLong (1982) are described below:

- **Managerial Competence:** The desire to engage in managerial activities such as supervising, managing and coordinating the work of others. Three areas of competence are particularly relevant to the present discussion: analytical competence or the ability to solve problems and make decisions, interpersonal and inter-group competence, and emotional competence.
- **Technical/Functional Competence:** The desire to engage in technical activities in order to gain proficiency or perfect skills in a certain area. Generally, career advancement into management is not desirable for the individual as it may be disruptive to their primary focus of work.
- **Entrepreneurship/Creativity:** The desire to create new products or services. The primary focus is the creation of a new venture despite challenges, risks or obstacles in order to make one’s mark on the world.

¹ While in some quarters a distinction is made between IT and IS, for purposes of this paper the term ‘IT’ is used to include the information systems profession and its workforce.

- **Autonomy/Independence:** The desire to be free from constraints and restrictions in the pursuit of managerial or technical competence. These constraints and restrictions are diverse in nature and include issues such as freedom of choice regarding when to work, how to work and where to work.
- **Service/Dedication:** The desire to help others and recognize a change for the greater good.
- **Challenge/Variety:** The desire to take on challenges and the need to overcome difficult obstacles and situations.
- **Lifestyle Integration:** The desire to balance career with family and personal growth needs.
- **Identity:** The desire to have status and prestige derived from working at a powerful or prestigious organization.
- **Organizational Security:** The desire to have organizational/job security by staying faithful to an organization. Security can exist in the form of financial security (income), retirement security or employment longevity.
- **Geographical Security:** The desire to enact one's career within a particular geographic region. Geographic security is typically motivated by the desire to live in a single community for an extended period of time.

It is important to note that Schein (1978) originally developed the theory of career anchors by conducting a longitudinal study of 44 male alumni from the Sloan School of Management at Massachusetts Institute of Technology. It was on the basis of this sample that he made generalized claims about career anchors for a larger population that included women as well. Although the initial theory was based strictly on a male population, later investigations included populations of both men and women. This raises a question about traditional gender roles and assumptions regarding career values and motivations in early theoretical formation.

Over the last decade, researchers have established the value and legitimacy of the career anchors theoretical foundation in the IT workforce (e.g., Crepeau et al., 1992; Igarria et al., 1991; Ramakrishna et al., 2003; Wynne et al., 2002). While researchers investigating career anchors in the IT workforce have found evidence of their existence, specific findings have been mixed. Many researchers have reported evidence of two primary career anchors – managerial competence and technical competence – among IT professionals. Crepeau et al. (1992) conducted a study with 321 IT professionals and found that most are typically oriented to managerial competence and technical competence career anchors as opposed other anchor types. Conversely, Igarria et al. (1991) surveyed 464 Association for Computing Machinery (ACM) members and argued that the majority of IT professionals are either managerially or technically oriented. Specifically, the authors found that systems programmers, applications programmers and software engineers tend to be technically oriented, whereas systems analysts, project leaders and computer managers tended to be managerially oriented. This study, however, conflicts with an earlier finding by Baroudi (1988), which found that few IT employees, despite type of IT job, held a technical orientation.

Researchers have also identified evidence of career anchors other than managerial and technical competence among IT professionals. Crepeau et al. (1992) found that in addition to these two career anchors, the IT professionals in their study also possess a wide variety of other career anchors that are largely independent of one another. They reported that the following career anchors were evident: managerial competence, technical competence, autonomy/independence, service/dedication, identity, challenges/variety, geographical security and organizational security. Ramakrishna et al. (2003) reported in a study of 163 IT professionals that nine career anchors were in evidence including: managerial competence, identity, variety, service, geographic security, autonomy, organizational stability, technical competence and creativity. Sumner et al. (2005) report slightly different results in that four career anchors were most prevalent among IT professionals: creativity, autonomy, identity and variety. Likewise Smits et al. (1993) found that among 1,000+ newly graduated IT professionals the most prevalent career anchors were autonomy and challenge. Wynne et al. (2002) argue that IT professionals in the U.S. Air Force placed importance on job security, service, and lifestyle factors, but did not demonstrate alignment with managerial or technical competence.

In an attempt to account for the wide range of findings about career anchors among IT professionals, researchers have also included additional factors such as age and gender in their analyses. Igarria et al. (1991) conducted one of the first studies of gender and career anchors among IT professionals. They reported that women in their study were more lifestyle oriented and less technically oriented than men. The authors explained that female employees in their study who were lifestyle oriented tended to be relatively unconcerned with challenge, service and entrepreneurship.

By way of challenging gender stereotypes, they also found that the women were more likely to be in software engineering and applications programming than other types of jobs. They reported that other factors such as age, education level, marital status, tenure in the job, the organization and the MIS field were not determinates of career anchors.

More recent studies of women in the IT workforce, have conflicted with the Igarria et al. (1991) study. Rommes (2005) investigated career anchor perceptions of teenage boys and girls interested in IT careers and found that gender was not relevant in career anchor decisions. Challenging common assumptions about gender, her study found boys and girls within a given career anchor to be *more related to each other, than were boys or girls to their sex groups* [emphasis added]. Similarly, Gomez-Mejia (1990) conducted a study of employee values in a high-tech corporation and found that occupational differences were greater than gender differences. For instance, Gomez-Mejia explained that *female managers were more similar to male managers than to female production workers* [emphasis added] at this particular corporation. Furthermore, Crook et al. (1991) found in their study of over 300 IT personnel, that *gender was not a determinate factor in career anchor categorizations* [emphasis added]. Rather, men and women placed equal value on stable careers (organizational security), helping others (service/dedication) and challenges in their careers (challenge/variety). Finally, in their study of over 2,000 IT professionals in the UK, Panteli et al. (1999) reported that men and women had similar values in terms of challenge, and organizational security.

This review of the career anchor research reveals two important insights about gender. First, the original study of career anchors upon which all subsequent research was based included only men in the sample. Second, the findings of career anchor research that focuses on gender differences are sufficiently contradictory so as to challenge the commonly held assumption that there is a consistent set of “woman’s” career anchors. This suggests that gender is not an immutable factor governing one’s career anchors. However, *this* conclusion stands in stark contrast to gender research which assumes that issues related to work-life balance best explain women’s under representation in the IT workforce. Built into this assumption is another assumption: that all women’s career anchors are primarily about work–life balance. Therefore, in an effort to shed some light on this apparent conundrum we engaged in a research project to revisit the assumptions about career anchors and career values for women in the 21st century IT sector. The research question for this project was the following: *How are career anchors manifested in the experiences of women in the American IT workforce?*

Research Design

Theory

The theoretical perspective chosen for this research resulted from our desire to understand the varied gender and career anchor findings that have appeared in the literature by revisiting the assumption that all women will have uniform career anchors. Critics of gender and IT research have commented on the lack of appropriate theorization of gender and IT (e.g. Adam et al., 2004). They have observed that much of the gender and IT research involves *implicit* -- generally essentialist² -- gender theorizing. For this study we sought to examine gender and the IT profession in a way that would shed light on the variation among women’s career anchors that has been documented in the literature. Therefore, rather than invoking an essentialist theory that all women are motivated by the same career values, or a gender theory that focuses on differences between men and women, we sought to theorize career anchors by directing our attention toward the individual and societal factors that might account for the variation among women.

While essentialist gender theories posit a common experience for all women, researchers such as Maccoby (1998) suggest that a combination of nature and nurture conceptualized as individual differences can better account for observed differences in human behavior. For example, Coltrane (1996) explains that a variety of constructs can be used to investigate individual differences, but adds that three factors are typically used: biological factors, cognitive factors, and socialization factors. She argues that “biological predispositions never manifest themselves without the appropriate environmental conditions being present to activate them” (p. 292). Similarly, feminist authors such as Barrett (1987), Butler (2006) and Hughes (2002) conceptualize within-gender difference as ‘experiential diversity’

² Essentialism is a theory of inherent group-level characteristics (in this case, possessed by women) that result biological, psychological or sociological factors (DeCecco et al., 1993; Marini, 1990; Wajcman, 1991).

arising from racial, class, age, sexual orientation or ethnic differences. Consequently, researchers have argued for investigations that account for greater variation among people through the use of alternative theoretical perspectives. Indeed, Wajcman, one of the most cited authors on gender and technology, has observed that “although studies do find evidence of differences between the sexes, the variation within the sexes is more important than the differences between them” (Wajcman, 1991, p. 157).

For these reasons we employed the emergent *individual differences theory of gender and IT* (Trauth, 2002, 2006; Trauth and Howcroft, 2006; Trauth et al., 2004, 2006a, 2006b, 2008a, 2008b) as a lens for theorizing the variation in career motivations that exist among women in the IT workforce. To date, this theory has been used to investigate variation in factors that account for women’s participation in the IT field. These differences have been shown to affect the ways that women are exposed to, experience and respond to gender relations in the IT profession (Trauth and Quesenberry, 2006). This theory enables conceptualization of gender relations and IT at two different levels: 1) women as members of a group who encounter group-level (i.e. gender) biases; and at the same time 2) women as individuals having distinct personalities, and experiencing different individual and socio-cultural influences.

The explanatory power of this theory lies in its three constructs. The *individual identity construct* includes both personal demographics (e.g. age, race, nationality and socio-economic class), and career items (e.g. industry in which one works). The *individual influence construct* includes personal characteristics (e.g. educational background, personality traits and abilities) and personal influences (e.g. mentors, role models, and significant life experiences). Finally, the *environmental influence construct* includes cultural attitudes (e.g. attitudes about women, about women in IT) as well as economic and policy influences in the geographic region in which an individual lives. The individual differences theory of gender and IT posits that, collectively, these constructs account for the differences among women in the ways they relate to the IT field, and respond to gendered discourses about IT.

This theorizing about within-gender variation as it relates to women in the IT profession draws from several feminist theories, thereby serving as a bridge between feminist literature and the IS field. It builds upon Rosser’s (2006) analysis of the ways in which feminist theories connect gender relations to the technological workforce, and technology design and use. Liberal feminism places a focus on removing barriers that prevent equal access for women to jobs historically seen as a male domain. Critics of liberal feminism claim that because it is so imbued with capitalism it focuses too much on individual agency to the exclusion of social conditions that help to explain women’s under representation in technology fields. In contrast, socialist feminism rejects individualism and shifts the focus to societal factors. Relying on Marxist critiques, it places gender on an equal footing with class in the ‘social shaping of technology’ and technology professions. While socialist feminism is arguably the most widely developed and used of feminist theories in the technology area, Trauth departs from this perspective by exploring, empirically, the role that individual characteristics and experiences also play in accounting for women’s participation in the IT profession. In this respect, her theory aligns with feminist standpoint theory (FST). This theory argues for privileging the situated knowledge of marginalized individuals. FST acknowledges the embodied knowledge and varied experiences of woman based upon such factors as race and social class (Harding, 2004). However, as a critical theory, emancipation remains the focal point. In contrast, Trauth is interested in how women are exposed to the IT field, come to see it as consistent with their gender identity and overcome systemic biases. Thus, emancipation is part but not the totality of the perspective. Finally, strains of postmodern or poststructuralist feminism can be seen in Trauth’s theory in the acknowledgement that women do not all speak with a unified voice. Postmodern feminism stresses that because of women’s national, class and cultural identities, the category of ‘woman’ can no longer be regarded as smooth, uniform and homogenous (Brooks, 1997). While agreeing with the rejection of a ‘universal woman’ Trauth departs, however, from the postmodern implication that there are no systemic gender biases. Rather, she argues that the variation occurs in the ways in which women are exposed to, experience and respond to systemic gender bias (Trauth and Quesenberry, 2006).

Only recently has the idea of within-gender variation been considered in the career anchor literature. Quesenberry and Trauth (2007), found that a variety of individual identity, individual influence and environmental influence factors have a role in career anchor alignment. Similarly, Crook et al. (1991) found that a number of women in their study were aligned with organizational security, managerial competence and technical competence or service, variety and identity. When the authors further examined the women in their study they found that tenure in the job had a significant role in career anchor alignment. Women with more than five years experience in the field typically aligned with organizational security, managerial competence and technical competence career anchors. On the other hand, women with less than five years experience in the field typically aligned with service, variety and identity career anchors. In addition, Ferratt et al. (2006) found in a study of 255 IT professionals that while there are differences among women and men, not all female IT professionals have the same needs. Finally, Adya (2008)

reported that women who identify with lifestyle integration issues expressed differences in how these pressures impact their long-term commitment to IT careers. Because the individual differences theory provides a robust way in which to focus on the differences *within* rather than *between* the sexes, we found it to be the most appropriate theoretical perspective to guide our work. Hence, we chose to extend this theory by applying it to a new context: career anchors.

Epistemology and Methodology

The primary goal of this research was to seek a better understanding of the factors that contribute to the variation in career anchors among women that has been expressed in the literature. This was accomplished by exploring the role of career anchors within the context of organizational setting. This research required an interpretive epistemology because the focus was on subjective understanding of the phenomena (career anchor) within its context. That is, the research was directed at understanding the manifestation of career anchors in the working lives of the women who participated in the studies. In addressing this research question, we aimed to build an understanding of how and why certain women become identified with a given career anchor type. To accomplish this task, we needed to develop a situated understanding of factors in the women's life stories (i.e., personal characteristics and influences, and backgrounds) that would help to explain how career anchors were manifested.

To accomplish our research goal we employed a sequential mixed-method approach that was comprised of two phases. The first component of this research consisted of a theme identification phase. The purpose of this phase was to identify and explore themes related to female career anchors and their role in career experiences and decisions. During this phase, relevant themes and the categorical components of career anchors and their relevance to female retention in the IT workforce were identified and explored. The methodology employed in this phase consisted of an in-depth literature survey of published research on the IT workforce and an analysis of an existing dataset of 92 interviews conducted with women in the American IT workforce between 2002 and 2006. This dataset is from a field study conducted by the second author as a part of a multi-year National Science Foundation funded research project.³ In this study open ended interviews lasting approximate 90 minutes were conducted by the second author in order to explore personal characteristics, individual influences and societal influences that served as both barriers and facilitators of their careers in IT. Since the participants in the interviews were not explicitly asked about career anchors using Schein's terminology, the data analysis for this paper required that the authors recode the data. In doing so both open coding and selective coding techniques were employed by the first author and reviewed by the second author to ensure intra-reliability.

The second component of this research consisted of an empirical phase to further refine the understanding of career anchor alignment of women in the IT workforce. This phase consisted of the development, administration, and analysis of an on-line questionnaire that was administered to 210 women employed in four IT organizations between 2006 and 2007. The online questionnaire was based, in part, on: the analyses of published literature on the IT workforce and gender and IT; the Career Orientations Inventory (COI) developed by Schein (1990); and the qualitative analysis of the existing dataset. Backgrounds and characteristics of the 302 participants from both datasets can be found in Table 1.

³ This research was funded by a grant from the National Science Foundation (Grant Number: EIA-0204246).

Table 1. Participant Demographics

	# of Women	% of Women
Demographic Information		
Median Age	41	-
Racial/Ethnic Background		
European/White American	243	81
African/Black American	29	10
Asian/Indian American	13	4
Middle Eastern American	3	1
Hispanic American	10	3
Other	4	1
Sexual Orientation		
Heterosexual	279	92
Homosexual	8	3
Bisexual	5	2
Unknown ⁴	10	3
Relationship Status		
Single	50	17
Partnered	23	8
Married	202	66
Divorced (Not Remarried)	24	8
Widowed	3	1
Motherhood Status		
No Children	137	45
One Child	61	20
Two Children	73	24
Three or More Children	31	10
Total	302	-

Findings

Schein (1987) explained that “within any given occupation or career, there are indeed very different kinds of people with different goals, life-styles, talents, and values” (p. 165). In this sense, career anchors do not determine the occupation one enters, but rather are used in career decision processes. As a result, a given occupation can be filled with individuals who identify with a variety of career anchors. As an illustration of this, the following section describes the various ways in which career anchors are manifested in the background and life experiences of women in the American IT workforce.

Qualitative Findings

Evidence of the existence of all career anchors was found among the women in the qualitative phase of this study. Although the women in this phase expressed sentiments across all the career anchors, one commonality is that the majority of the women identified with one of the following: technical competence, managerial competence, or organizational security. Specifically, of the 92 women included in the phase, 74 women (or 80 percent) spoke about values associated with one of these three career anchors. The most prevalent career anchor was technical competence, which was evident among 30 women (or 33 percent). Managerial competence and organizational security were also commonly identified among the women. Twenty-six women (or 28 percent) identified with managerial competence and 22 women (or 24 percent) identified with organizational security. Several of the career

⁴ In the first phase the women were not explicitly asked about their sexual orientation. Hence, the information about sexual orientation is interpreted from the responses of the women. If it was impossible to determine a woman’s sexual orientation, then she was categorized in the unknown category. In the second phase women were able to withhold sexual orientation information.

anchors – challenge/variety, autonomy/independence, entrepreneurship/creativity and service/dedication – were found to a moderate extent among women. Fourteen women (or 15 percent) identified with challenge/variety and autonomy/independence. Thirteen women (or 14 percent) identified with entrepreneurship/creativity. Eleven women (or 12 percent) identified with service/dedication. The remainder of the career anchors – lifestyle integration, geographic security, and identity – were found among a fewer number of women. Six women (or 7 percent) identified with lifestyle integration and geographic security. Only three women (or 3 percent) identified with the identity career anchor.

Table 2. Qualitative Phase Career Anchor Manifestations

Career Anchor Alignment	# of Women	% of Women
Technical Competence	30	33%
Managerial Competence	26	28%
Organizational Security	22	24%
Autonomy/Independence	14	15%
Challenge/Variety	14	15%
Entrepreneurship/Creativity	13	14%
Service/Dedication	11	12%
Lifestyle Integration	6	7%
Geographical Security	6	7%
Identity	3	3%

Technical Competence

Thirty women (or 33 percent) expressed sentiments consistent with the technical competence career anchor. These women spoke about valuing a career that afforded them opportunities to gain proficiency or to perfect skills in technical areas. The women frequently spoke about their passion for technology as the primary factor motivating their career choice. Many of women also explained that their interest in IT initially stemmed from a natural ability to work with computers. For instance, Alicia, a 31 year-old network systems engineer, explained that her love of computers came at a young age:

[I was first exposed to computers in the seventh grade and it gave me the opportunity to]⁵ really see what computers were all about. I just loved computers. And [I] always thought I was going to be a programmer after that. [Alicia]

Eight of the women expressed an interest in playing video games. Nine of the women also considered themselves to be “computer geeks” or an individual who has a passion for the pursuit of computer knowledge. The nine women who identified themselves as geeks spoke about this quality as a positive aspect of their personality. Furthermore, many of women spoke about role models, and in particular male role models, as an important part of their initial exposure to IT. In fact, 25 women (or 30 percent) who spoke about technical competence also spoke about fatherhood themes. For instance, Kimberly, a 38 year-old webmaster, added that her father is a role model for her choice in an IT career:

My dad is an engineer and I'll describe to you how he exposed me to technology [at a very] young [age]. ... When I was eight, my father [would bring] me in the office with him on weekends when he had work to do work. He would sit me in front of his Radio Shack TRS80 and give me these basic programs that were in Byte Magazine. I had no idea what I was doing but he would just say, “Type them in and then do ‘Run’ and see if they work”. [Kimberly]

Twenty-four of the 30 women who are aligned with the technical competence career anchor also discussed several personal characteristics that they found important to their technical careers. These characteristics included: having an “if-then-else” type mentality, a passion for learning new things quickly, and having the ability to learn new technical skills without formal training through “trial by error” experiences. Several of the women also spoke about

⁵ Text that appears in brackets indicates a part of the participant’s transcript that was edited by the authors to shorten lengthy responses.

the feelings of self fulfillment that they gain from careers in the IT workforce. Some women also discussed the need for organization and control that they find satisfied in a technical career.

Managerial Competence

Twenty-six women (or 28 percent) expressed sentiments consistent with the managerial competence career anchor. Not surprisingly, seven of the eight chief executive officers (CEOs) and chief information officers (CIOs) expressed sentiments consistent with the managerial competence career anchor. Other women have not received the professional success of these individuals, but still have aspirations to pursue management careers in the IT workforce. Many such women are currently employed in middle-management positions and entry-level management positions. For example, Danielle, a 25 year-old project analyst, thinks her management strength lies in her ability to communicate both with “hard core programmers” and non-technical people:

I definitely want to be in a managerial role. [I am] still not clear what opportunity in IT I want to be in. I have been through the technical side and gained experience in project management. I now have a customer service type focus as time goes on. I am not involved with technical training or experience. Those skills are falling off, so I think I am leaning more towards the soft side of IT. I am also getting my MBA. [Danielle]

The majority of women who identified with the managerial competence career anchor also discussed several factors important to IT management careers. Several women discussed the need to have both technical and human skills. These women expressed an interest in working with IT and building an in-depth knowledge of the technical aspects of their careers. Marthea, a 50 year-old CIO, felt that having a solid technical background was a very important piece of a management career in the IT workforce:

It's really an advantage to have a more detailed technical background before you start moving up [the management ranks]. So I'm afraid if [women] concentrate just on the touchy feely, they are going to start out only as management levels and they are not going to have the technical background that they really need to advance up through. They may actually find themselves hitting a glass ceiling based on the fact that they don't have that technical background. [Marthea]

The majority of women also spoke about interpersonal communication competence as a foundation to managerial competence. Many women believed that leadership skills are a foundation to managerial competence. Several women shared experiences about challenging situations associated with being a female manager in a male dominated workforce. In addition, 21 of the 26 women also spoke about the importance of role models. Furthermore, several of the women discussed the importance of earning graduate degrees in order to move into management. In fact, ten of the 26 women who expressed sentiments consistent with the managerial competence career anchor hold graduate degrees.

Organizational Security

Twenty-two women (or 24 percent) expressed sentiments consistent with the organizational security career anchor. Many of the women pursued a career in the IT workforce because of the industry growth and lucrative pay. A few women made career changes into the IT workforce from other industries because they felt the job security was enticing. For instance, Amber, a 31 year-old web developer, originally had a career in secondary education, but did not believe she could support her son on a teacher's salary. She knew of the salary that employees in the IT workforce were earning and felt that was where she wanted to be in the long term:

That was another reason why I chose the IT – looking at how much money people were making coming out of that industry. I didn't think that as much when I was finishing my career in education. But because I couldn't find a job, I knew I needed to go somewhere else because I was not going to be able to support my son on a substitute teacher's salary. [Amber]

Once employed in the IT workforce, several of these women spoke about basing their continued career choices on organizational security. A few of the women spoke about sentiments aligned with organizational security not only from a salary perspective, but also from health benefits and job security perspectives.

Background characteristics also had a role in the alignment with the organizational security career anchor. Nine of the 22 women who expressed sentiments aligned with the organizational security career anchor also came from low

income families. These nine women explained that their parents typically worked in blue collar or service occupations with high school degrees. The women spoke about how the hardships in their childhoods enticed them to work harder in order to achieve monetary success in their careers. In addition, five of the eight single mothers spoke about sentiments consistent with the organizational security career anchor. These women explained that, as the primary financial providers of their families, income is highly valued. For instance, Carey, a 55 year-old director of marketing, is also the sole financial provider for her son and was extremely focused on “putting bread on the table.” Furthermore, 13 of the 22 women who expressed sentiments aligned with the organizational security career anchor also live the Boston, Massachusetts area, in the most expensive region of the country from which participants were drawn.⁶ Three of these women felt that the high housing costs and overall cost of living made it difficult for single-income families to live in the area.

Autonomy/Independence

Fourteen women (or 15 percent) expressed sentiments consistent with the autonomy/independence career anchor. Thirteen of these women also spoke about motherhood themes. Many of the women felt they derived their internal strength from strong women present in their lives. Also, several of the women felt that they would have little sense of organizational loyalty if their independence was threatened. For example, Alma, a 52 year-old business development lead, explained that at a very young age she craved independence. When asked why she selected her current job, she said that she isn’t the type of person who likes to be told what to do and prefers independence for herself.

Challenge/Variety

Fourteen women (or 15 percent) expressed sentiments consistent with the challenge/variety career anchor. Many of these women spoke specifically about how doing IT work is a challenge. Further some of these women spoke about working in a male dominated industry as a challenge, in itself, that they enjoyed taking on. All 14 women who spoke about challenge and variety also considered themselves to be assertive. In addition, several of the women indicated the ways in which working in the IT workforce satisfied their need for variety in their careers. For instance, Veronica, a 31 year-old manager of IT service and support, explained that she enjoys a career in the IT workforce because the technology is constantly changing:

Somehow I got into IT and I saw the type of activities going on. There was always action going on, and I liked that. It wasn’t the same boring thing. ... The work varies, and you always have to keep learning. That is what really attracted me to IT. [Ivanna]

Finally, several of the women mentioned that they would have little sense of organizational loyalty if the variety of their job is threatened. Ten of the 14 women who spoke about challenge and variety had experienced one or more job changes during their careers in the IT workforce.

Entrepreneurship/Creativity

Thirteen women (or 14 percent) expressed sentiments consistent with the entrepreneurship/creativity career anchor. For the most part, the focus of the entrepreneurship/creativity career anchor is on the creation of new products or services despite challenges, risks or obstacles to doing so. Janinne, a 32 year-old IT entrepreneur, owns her own technical writing company. She had been frustrated with her technology job so she decided to start her own technical writing firm. All thirteen of the women in the dataset who spoke about entrepreneurship or creativity also spoke about being motivated to succeed in their careers despite barriers and challenges.

Service/Dedication

Eleven women (or 12 percent) expressed sentiments consistent with the service/dedication career anchor. Many of the women spoke about the ways in which IT enables them to accomplish their goals of helping others. Specifically,

⁶ The women in the qualitative phase were drawn from three regions: Boston, Massachusetts, Research Triangle Park/Charlotte, North Carolina and central Pennsylvania.

six of the women spoke about the ways in which IT is important for the greater good of the organization and its employees. For example, Zoie explained:

I have always been socially minded. It does not fit yet, what I want to do, but I always wanted to do something that impacts society. You can make an argument that technology does [impact society]. I can see myself going more in that direction in my career. [Zoie]

Some of the women view teaching about IT as a form of service to others. Three women spoke about the enjoyment they receive from teaching and mentoring others about IT and the change it can bring to people's lives for the better.

Lifestyle Integration, Geographic Security and Identity

The remainder of the career anchors – lifestyle integration, geographic security, and identity – were found among a fewer number of women. Six women (or 7 percent) identified with the lifestyle integration career anchor. In terms of family motivation, most of the women who aligned with lifestyle integration are married (86 percent) or divorced/not remarried (14 percent) and have one or more child (86 percent). Given their family dynamics and structures, the ability to balance work and life was important for these women. Alma spoke about her need to remain in the region where she currently lives despite better job opportunities outside the area:

[The flexibility to balance work and life] is another reason for staying [here]. I know right now I could go double my salary in D.C. but I don't want to live that lifestyle. I don't know how many people down there get to their kid's school play or get them to a doctor's appointment. ... I know right now if I was willing to move, I could be in those senior level ranks inside of [my company]. I am not willing to do that. It is a lifestyle choice. [Alma]

Many of the women who identified with geographical security spoke about family roots as being a tie to a specific region. Finally, the three women who were aligned with the identity career anchor have a number of individual influences in common. All three women spoke about work as an important component of their lives, felt a strong sense of self-esteem and took internal promotions in order to remain employed at a particular organization for an extended period of time.

Quantitative Findings

The purpose of the quantitative phase was to further refine the understanding of career anchors of women in the IT workforce. In this phase a questionnaire was developed that is based, in part, on the analyses of published literature on the IT workforce and gender and IT, the Career Orientations Inventory (COI) developed by Schein (1990), and the qualitative analysis from the first phase of this research. Several factors influenced the choice of a quantitative component in this research. First, the COI has exhibited high reliability and validity in measuring career anchors in prior research (e.g. Crook et al., 1991; DeLong, 1983). As a result, the majority of career anchors researchers administer the COI in their investigations in order to identify the career anchor alignment of their participants. Hence, in order for the researchers to build on prior research about career anchors in the IT workforce, they also administered the questionnaire. In addition, analyzing data from two perspectives – a qualitative component and a quantitative component – enabled the development of insights about the same phenomena from different perspectives.

Career Anchor Manifestations

Evidence of all career anchor types was found among the women in the quantitative phase of the study according to the results from the COI. Although, the women identified with all of the career anchors, the majority of the women identified with lifestyle integration. Specifically, of the 210 women, 78 women (or 37 percent) identified with lifestyle integration. Organizational security and challenge/variety were also commonly identified with the women. Thirty-two women (or 15 percent) identified with organizational security and 28 women (or 13 percent) were identified with challenge/variety. Twenty-two women (or ten percent) identified with technical competence, 16

women (or eight percent) with service/dedication, 15 women (or seven percent) with autonomy/independence and entrepreneurship/creativity, and four women (or two percent) with managerial competence.⁷

Table 3. Quantitative Phase Career Anchor Manifestations

Career Anchor Alignment	# of Women	% of Women
Lifestyle Integration	78	37%
Organizational Security	32	15%
Challenge/Variety	28	13%
Technical Competence	22	10%
Service/Dedication	16	8%
Autonomy/Independence	15	7%
Entrepreneurship/Creativity	15	7%
Managerial Competence	4	2%

Individual Identity

A variety of individual identity and background characteristics were analyzed in order to determine if these factors have an association with career anchor identification. Specifically, the following characteristics were examined: age, racial and ethnic background, relationship status, and number of children.⁸ It was found that none of these factors were significant with regard to career anchor correlation.

With regard to age, the oldest mean age (44.3 years) was found for the autonomy/independence career anchor and the youngest mean age (37.3 years) was found for the managerial competence career anchor. However, analysis of variance (ANOVA)⁹ tests demonstrates that there are no significant differences in the average ages of women with different career anchors ($F=.867$, $df=7,209$, $p=.53$).

The racial and ethnic backgrounds of the women were evenly distributed across career anchors. Many of the non-White categories had small counts and zero cells. Hence the power of analysis was limited by the number of women in the non-White category. For purposes of analysis the racial/ethnic identity categories are collapsed into Caucasian, African American/Black and Other in order to eliminate zero categories. While this procedure removed the instability in chi square caused by small cell frequencies, it did not improve the significance value. Therefore, it is concluded that there is no significant relationship between racial/ethnic identity and career anchor identification.

The relationship statuses of the women were evenly distributed across career anchors. The chi square for career anchor by relationship status approaches, but does not reach conventional significance ($p=.05$). Therefore, it is concluded that there is no significant relationship between relationship status and career anchor identification.

The motherhood status of the women was not equally distributed across career anchors. It is noteworthy that nearly half the sample from this phase (46.2 percent) has no children. The highest percentage of mothers was found for the managerial competence, entrepreneurship/creativity, and lifestyle integration career anchors. Likewise, the highest mean number of children was found for the managerial competence, entrepreneurship/creativity, and lifestyle integration career anchors. In contrast, the lowest mean number of children was found for the autonomy/independence and service/dedication career anchors. Nevertheless, analysis of variance tests showed that there are no significant differences in the average number of children of the women with different career anchors. More specifically, the mean number of children for each career anchor type is not significantly different from any other. Hence, it is concluded that there is no significant relationship between motherhood status and career anchor identification.

⁷ The COI is based upon Schein (1990) categorization of career anchors. His categorization does not include two career anchor types, geographical security and identity, which are typically found in organizational behavior studies. Therefore, statistics about these two categories were not captured through the COI questionnaire and calculations.

⁸ Since the majority of these women (96.7 percent) identified as heterosexual there was insufficient variation in sexual orientation for meaningful analysis along this dimension.

⁹ Assumption checks were conducted for all analysis of variance tests. For space limitations these results are not included but can be provided upon request.

Several additional statistical tests were performed to further explore the relationship of motherhood to career anchor identification. In these additional tests, all of the career anchors were combined and compared to the lifestyle integration career anchor. Next, the means and standard deviations were calculated. Finally, a chi square test was performed. The results (chi square = 2.08, df=1, $p = .150$) were not significant, thereby indicating no significant difference in the proportion of women having children who are aligned with the lifestyle integration career anchor (60.3 percent) versus all other women (50 percent). Thus, these analyses demonstrates that there are no significant differences between the lifestyle integration career anchor and all other career anchor types in either having children or in the number of children a woman has.

Background Characteristics

A variety of background characteristics were analyzed in order to determine if these factors have an association with career anchor identification. Specifically, the following characteristics were examined: highest degree earned, degree type, years in the IT workforce and years in current job. It was found that none of these factors were significant with regard to career anchor prediction.

The highest educational degree earned and type was distributed across career anchors. Yet, due to the large number of zero and small cells, the chi square is not reliable. Therefore, it is concluded that there is no significant relationship between the highest degree earned or type and career anchor identification.

The number of years the women have been employed in the IT workforce was evenly distributed across career anchors. The highest mean (16.9 years) was found for the challenge/variety career anchor and the lowest mean (9.5 years) was found for the technical competence career anchor. Analysis of variance tests demonstrated that there are no significant differences in the average number of years a woman has been employed in the IT workforce with different career anchors. Therefore, it is concluded that there are no significant differences for career anchors and the number of years a woman has been employed in the IT workforce.

The number of years the women have been employed in their current job was evenly distributed across career anchors. The highest mean (7.9 years) was found for the entrepreneurship/creativity career anchor and the lowest mean (3.6 years) was found for the managerial competence career anchor. However, analysis of variance tests showed no significant differences in the average number of years a woman has spent in her job with different career anchors. Therefore, it is concluded that there are no significant differences for career anchors and the number of years employed in her current job.

Emergent Themes from the Qualitative Phase

In addition to the individual identity characteristics, several other themes that emerged in the qualitative phase of this research were analyzed in order to determine if these factors had an association with career anchor alignment. The childhood interest in a career in the IT workforce was distributed across career anchors. The lowest mean (mean = 2.7) or the most interested while in childhood was found for the lifestyle integration career anchor. The highest mean (mean = 3.3) or least interested while in childhood was found for the service/dedication career anchor. Analysis of variance tests, as shown in Table 4, demonstrate that there are no significant differences for childhood interests and career anchor alignment. This table shows that differences between means are not significant $F(7,209)=.77, p=.615$, with a p value that is far above the conventional significance level of $p<.05$. Therefore, it is concluded that there are no significant differences for childhood interests and career anchor prediction.

Significant differences were found, however, for feelings about accepting the challenges associated with a career in the IT workforce and career anchor identification. The women's feelings about accepting the challenges were distributed across career anchors. The lowest mean (1.3) or the most interested in accepting challenges was found for the challenge/variety career anchor. The highest mean (1.8) or least interested in accepting challenges was found for the entrepreneurship/creativity career anchor. Analysis of variance tests, as shown in Table 4, show that the result are significant indicating that not all means are equal for the career anchor types (i.e., at least one is significantly different from another.). Consequently, a post hoc pairwise analysis was conducted in order to determine what means are different from the others. This analysis demonstrated that organizational security and challenge/variety are significantly different from lifestyle integration and entrepreneurship/creativity. Therefore, it is concluded that significant differences do exist for feelings about accepting the challenges associated with a career in the IT workforce and career anchor identification.

Table 4. ANOVA for Accepting Challenges

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.5	7	0.7	2.139	.041
Within Groups	61.6	202	0.3		
Total	66.1	209			

Discussion

While evidence of all career anchors was found among the women in the study, major differences emerged from the two phases. In the qualitative phase, managerial competence ranked very high and lifestyle integration ranked very low. Yet in the quantitative phase, the opposite was the case. This occurred despite the fact that the women are similar in important ways. In both phases approximately one third of the women held management positions. Furthermore, approximately half of the women in both phases have children. These differences in career anchor manifestation despite respondent similarity can be attributed to the methodology. In the qualitative phase, the selective and open coding afforded the researchers the opportunity to examine career anchor identification across a woman's entire life history. This revealed, for example, the fact that the technical and managerial competence career anchors appeared at different times in the women's lives. Technical competence typically appeared earlier in their careers during secondary or post secondary education. However values about managerial competence were recognized later in their careers once they had experiences as managers or the ability to move up in their careers. Further, the qualitative methodology allowed the researchers to identify multiple career anchors (or career anchor clusters) for an individual. Typically the discussion of career values and motivations resulted in the identification of primary and secondary career anchor alignments. It is also possible that some career anchors (e.g. lifestyle integration and geographic security) change over time as women's personal responsibilities shift (e.g. in and out of being the primary care provider for small children, aging parents, etc.). In contrast, the COI used in the quantitative phase restricted the women to expressing career anchors for the particular moment in time when the data were collected and limited them to expressing a single career anchor.

For this reason, a factor analysis was also conducted during the quantitative phase in order to explore career anchor clusters in this data set. The specific questions for these factors were then evaluated and grouped into three meaningful categories or clusters. The first cluster relates to organizational autonomy and entrepreneurship. It was found that the autonomy/independence and entrepreneurship/creativity career anchors were correlated with this cluster. In addition, the lifestyle integration career anchor was negatively correlated. The second cluster relates to problem solving and competitiveness. A positive correlation was also found between this cluster and the challenge/variety career anchor. Yet, a negative correlation was found between this cluster and the lifestyle integration career anchor. The final cluster relates to balancing career and personal life. A positive correlation was found between this cluster and the lifestyle integration and organizational security career anchors whereas a negative correlation was found between the cluster and the following career anchors: challenge/variety, technical competence, and autonomy/independence. The existence of these career anchor clusters that were found in data collected via the COI stands in conflict with Schein's assumption that individuals can be aligned with only a single career anchor type.

A variety of individual characteristics were also analyzed during the quantitative phase in order to determine if they could be associated with career anchor identification. First, the following identity and background characteristics were examined: age, racial and ethnic identity, sexual orientation, relationship status, number of children, highest degree earned, degree type, years in the IT workforce and years in current job. It was found that none of these factors was significant with regard to career anchor prediction. Second, themes that emerged in the qualitative phase of this research were analyzed in order to determine if these factors could be statistically associated with career anchors. These included: early interest in computers and facing the challenges of working in a male dominated industry. No significant differences were found for childhood interests and career anchor alignment prediction. However, significant differences were found for accepting the challenges associated with a career in the IT workforce and career anchor alignment. Women aligned with the organizational security and challenge/variety career anchors were more likely to accept the challenges associated with a career in the IT workforce, whereas women aligned with the lifestyle integration and entrepreneurship/creativity career anchors were not as likely to do so. These findings were consistent across both phases of this study and demonstrate the diversity of career anchor identification among women. These results also show that this diversity cannot be simplistically attributed to

individual identify characteristics (i.e., age, race, motherhood status), alone, but, rather, are related to the lived experiences of women in combination with their background characteristics.

The results of this investigation suggest that the reason for the conflicting findings in the gender and career anchors literature is that gender, alone, is not a determining factor. That is, the fact that no consistent pattern of gender-based career anchors has emerged from the research suggests that a different type of gender theorizing is needed. The lack of clear gender-based differences calls into question essentialist gender theories as well as those that focus primarily on *differences between men and women*. Rather, the findings from this study suggest that more gender theorizing of a different type is needed. More gender theorizing is needed that is able to account for differences with respect to within-gender human behavior.

Thus, further empirical support is provided from this study for the emergent individual differences theory of gender and IT – with its focus on constructs that facilitate better understanding of within-gender differences. The theory is supported by the findings of diverse career values and motivations among the women in the study. The absence of a significant relationship in the quantitative analysis between demographic and identity characteristics, and career anchor alignment suggests that a woman's life experiences and background might provide a better explanation of woman's career anchor alignment. Thus, understanding why a woman is aligned with a particular career anchor is based on more than simply knowing her biological sex; it appears to be based on a variety of constructs including life experiences, talents and preferences. This finding is particularly important because it demonstrates the role of female agency in career choice and retention decisions.

Conclusion

Schein (1990) has argued that individuals have a single career anchor and that, once it is established, this career anchor is unlikely to shift during one's career. However, the results of this study which show the dynamic and clustering nature of career anchors gives us pause to reconsider long held assumptions about career motivations. As such, this study makes an important contribution to both research and practice.

With respect to research, this study contributes to the literature in two ways. One is the characterization of the discourses about organizational behavior, and gender and IT research as they relate to literature about career anchors for IT professionals. The other contribution to the literature is this study's empirical support for findings from earlier research which suggest that gender, alone, is not a determining factor in career anchor choice. Both the extant literature and the findings from this study show the diversity of career anchors among women in the IT profession. This study also makes a methodological contribution. It demonstrates the value of mixed-method research to enable different perspectives on a topic. However, it also shows the effect of data collection and analysis constraints on the findings that result. Finally, this study makes a contribution to theory by extending the scope of the individual differences theory of gender and IT to include career anchor variation among women in the IT field. The fact that no consistent pattern of gender-based career anchors has emerged from this research suggests that more gender theorizing is needed that focuses on within-gender variation.

With respect to practice, this study reinforces the need to move away from "one size fits all" managerial and human resource interventions that are directed at the recruitment and retention of women in the IT workforce. The results of this study demonstrate the complex nature of the ways in which career anchors are manifested in the experiences of women in the IT workforce. These findings show that women are typically aligned with more than one career anchor that cluster, dynamically, as a women moves through her career. As a result, organizations interested in the recruitment and retention of women should consider career management programs to specifically address the possibility of multiple career paths and career stages. In addition, career advancement opportunities and rewards should be diverse enough to satisfy the variety of values and motivations of all women IT professionals.

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