

ABSTRACT

FISH, KATHRYN SANDS. Exploring Women's Perspectives on Motivational Factors toward Job Satisfaction in a High Tech Organization. (Under the direction of Dr. James E. Bartlett, II, Ph.D.).

Companies in the technology sector foster high stress environments, deal with frequently changing business and products, and face a comparatively high employee turnover rate. Among these challenges, and prominent in the media today, is a noticeable gender divide in the industry: only 26% of technology-related positions were held by women in 2012. Despite these statistics, the sector also has immense potential for job growth, with a projected 1.4 million positions opening up by the year 2020. With increased research on the positive impact of women on the organizations they work for, it is necessary that technology companies gain a better understanding of their female employee population in order to improve recruitment, retention, engagement and professional development efforts for women. Using Q methodology, this study examines the groups and themes that exist based on the ranking of 75 motivational factors, how these differ by career stage and how they impact the female participant's current job satisfaction. Through data collection and analysis, this study finds that there are three main groupings of women who share similar views toward motivating factors: 1) women driven by intrinsic values of work; 2) women driven by external obligation and validation; and 3) women driven by time management control. Based on the analysis, there is not a significant difference in job satisfaction rating among these three motivational groups; all groups appear to be relatively satisfied.

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Exploring Women's Perspectives on Motivational Factors toward Job Satisfaction
in a High Tech Organization

by
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DEDICATION

Infinite thanks to my husband, Eric, for his support during this process.

BIOGRAPHY

Kathryn Fish, a Virginia native, has lived in North Carolina for the past three years. She obtained two undergraduate degrees in American Politics and French from the University of Virginia in 2007. Kathryn was introduced to the concept of adult continuing education in her role with CFA Institute's Educational Products Division. She continued her career in legal Professional Development at Wiley Rein, LLP in Washington, DC, where she also began to work toward her Master's in Human Resources Development. Since Kathryn has been in North Carolina, she has worked in a legal operations capacity at Red Hat, Inc., which is where she became interested in the topic of this thesis – women in technology. Kathryn lives in Raleigh with her husband, Eric, and dog, Coach.

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Exploring Women's Perspectives on Motivational Factors toward Job Satisfaction in a High Tech Organization

Introduction

A 2012 study conducted by the United States Department of Labor, Bureau of Labor Statistics found that, while fifty-seven percent of professional occupations in the United States workforce were held by women, they made up only twenty-six percent of professional computing occupations. Similar statistics are seen when examining the pipeline of women who take computer science courses in high school or who receive their undergraduate degrees in a technology-related field: nineteen percent of AP Computer Science test-takers in 2012 and eighteen percent of 2011 Computer and Information Sciences undergraduate degree recipients were female (U.S. Department of Labor, 2012). The gender divide in technology has developed into a prominent issue in 2013 and 2014, from the sheer lack of quantity of females in these occupations to broader conversations on unequal pay and underrepresentation in leadership and executive positions. Over the past five years, women who hold high profile leadership positions in high tech organizations have come under public scrutiny (Brady, 2013). Their professional career choices and path is scrutinized, as well as their personal choices and family, but often a combination of the two. Often, there is concern over how they can or cannot hope to successfully find balance. Some well-known examples of female leaders in the technology sector are Marissa Mayer, CEO and President of Yahoo!, Meg Whitman, CEO and President of Hewlett-Packard, and Sheryl Sandberg, Chief Operating Officer at Facebook. In the words of Sheryl Sandberg in her best-selling book, *Lean In*: "It has been more than two decades since I entered the workforce, and so much is

still the same...The promise of equality is not the same as true equality” (Sandberg, 2013, p. 7).

In addition to comprising the employee minority, these women are also faced with the added challenge of working in an industry with a comparatively high turnover rate. Research shows that technology companies cultivate short career lifespans given the fast-paced and frequently changing nature of their business and technology. A September 2013 Tech Republic blogpost on “IT Employment” describes a recent PayScale survey, specifically noting that “the employee turnover rate among Fortune 500 companies in the IT industry is the highest among all industries surveyed” (“Tech Companies Have,” 2013). Are women threatened by these types of work environments? Do high tech organizations fail to offer compensation and benefits that are attractive and competitive enough for women to stay in their current role? Do women leave to seek equally or more challenging careers at organizations in other industries?

Why is having women in technology so important? In addition to the laws of economics and diversity studies telling us that “if we tapped into the entire pool of human resources and talent, our collective performance would improve,” previous research investigates the impact of women in the workforce, specifically with regard to the technology sector (Sandberg, 2013, p. 7). In a study for the Anita Borg Institute for Women in Technology, Simard (2007) outlines human resources challenges experienced by technology organizations and describes how increasing the number of females in the workforce can contribute to solving some of these issues. Current challenges for high tech organizations include an estimated 120% cost of the yearly salary for filling positions of skilled technical

employees, an increase in the demand for high-level high-tech jobs despite the growth of offshoring positions, organizational need for more experience and a broader skillset in employees and marketplace competition for these skills, and dealing with high employee turnover and absenteeism (Simard, 2007). Simard argues that women play a key role in helping technology companies meet market demands, as well as improving their overall organizational culture and experience. Women meet the competitive criteria for the new demands of technical work, including interpersonal skills and business skills. Women are “paramount to user-driven innovation,” influencing 80% of consumer spending decisions and with the potential to bring new markets and technological applications to new lines of business and markets. Technology companies with a diverse workforce tend to promote a more positive image in the marketplace and lead to better decision making at all organizational levels. Simard also cites a 2004 study that found a correlation between the presence of women in higher management and financial performance of the organization (Simard, 2007).

In a July 2013 report on “Why Diversity Matter,” Catalyst pulled together recent data to build the business case for diversity consisting of four main pillars: improving financial performance, leveraging talent, reflecting the marketplace and building reputation, and increasing innovation and group performance. Their research supports Simard’s writing that women impact a company’s financial performance. Looking specifically at women in leadership positions, Catalyst cited a 2007 McKinsey study that found that 89 European companies that had the highest proportions of women in senior leadership positions and at least two women on their boards “outperformed industry averages for the Stoxx Europe 600,

with 10 percent higher return on equity, 48 percent higher EBIT, and 1.7 times the stock price growth” (“Why Diversity Matters,” 2013, p. 2). Catalyst also references a 2013 study that found that gender diversity is positively associated with increased sales revenue, more customers, and greater relative profits (“Why Diversity Matters,” 2013, p. 5). The association of decreased turnover intentions with an employee’s positive perceptions of the organization’s diversity climate and the increased effectiveness of group problem solving due to an increase in women are additional pieces of evidence that support Catalyst’s claim that diversity is essential to the success of organizations (“Why Diversity Matters, 2013, p. 9).

While the gender gap in high tech organizations has garnered a great deal of media attention, spurring the development of non-profit organizations such as the Anita Borg Institute and Catalyst, Inc. that are dedicated to “increasing the impact of women in all aspects of technology and increase the positive impact of technology on the world’s women” and “expanding opportunities for women and business,” it is also worth exploring as a social science question through research and the use of a theoretical framework. With limited research to date, technology companies can only benefit from a further understanding of their female employees, specifically how their motivations tie to job satisfaction. Through a mixed methods research approach and various statistical analyses, this study aims to provide insight into this topic and assist high tech organizations in creating an arsenal of tools they can use to improve recruitment, retention and the professional development of their female employees.

Statement of the Problem

The need to better understand how motivational factors for women working in high tech organizations affect their job satisfaction is a key driver for conducting this research. With a projection of 1.4 million computing-related jobs opening in the United States by the year 2020, a 16% increase over the previous decade, and one that is faster than the average for all occupations, it is imperative that technology companies determine what is needed to recruit and retain top-talent and specifically, top-talent females (U.S. Department of Labor, 2012; Ghazzawi, 2010, p. 2). From an employer's perspective, this knowledge may contribute to reducing spend on replacing departed employees, which can equal "150 percent or more of a worker's salary, including hiring, retraining, lost productivity and time spent supervising new employees," as well as assist in building a diverse organizational culture, and improve employee engagement (Solnik, 2012). If technology companies have insight into the motivational factors of their female employee population, they may be able to modify their current benefits plans, career trajectories, strategic programs and general policies to better meet women's needs and increase their job satisfaction. For female employees, working for a company that is aware of and supports their motivational needs may result in increased job satisfaction through fulfillment and empowerment, company loyalty, higher work ethic and positive morale. Technology companies that take advantage of this knowledge and tailor their recruiting, development and retention programs to their female employee population will be industry frontrunners of these initiatives. They will also benefit from satisfied employees, who "help boost the image of their organization by being more productive and by taking care of customers better" (Ghazzawi, 2010, p. 5).

Distilling motivational factors for women into categories that can be utilized by an organization is a valuable exercise. Recurring themes may provide insight into areas where an organization needs to focus and spend additional resources. Alternatively, research may shift views and theories currently held by management or highlight areas that may not be worth funding given that they will not likely affect the broader female population's job satisfaction. The concept of categorizing motivational factors and the subsequent effect had on employment satisfaction is embedded in the theoretical framework of Herzberg's two factor theory on motivation. This will be discussed in greater detail in the following sections.

While women who work in technology combat social and gender norms, including dealing with a male-dominated workplace, facing work-life balance, and keeping pace with a constantly changing business, increasing their employment numbers in this industry demands exploration and analysis if these organizations expect to flourish in size, culture and revenue. According to Catalyst's report, "an analysis of women's participation in IT patents found that mixed-gender teams in the United States produced patents that were cited 26 to 42 percent more frequently than the average" ("Why Diversity Matters," 2013, p. 12). Hyde and Kling state at the outset of their 2001 article for *Psychology of Women Quarterly*: "Women's educational and occupational achievements are crucial to the economic productivity and prosperity of the nation, as well as to the mental health of women and their families" (Hyde & Kling, 2001, p. 364).

Purpose of the Study

The purpose of this study is to examine the groups that exist based on how women who work in a high tech organization view and rank the motivational factors that are important to them in their current job. Through a Q methodological data collection process, the study examines how women group and rank a concourse of items concerning motivational factors. Additionally, the study explores the differences based on length of time working at the company and length of time working in the technology sector. Do women rate certain motivational factors higher if they are just beginning their career at the company? How might these change over the course of their tenure at the organization? In the tech sector? If they have worked in other industries? Technology organizations are relatively “young,” with the median age of employees falling between 30 and 35 years old according to a 2013 Payscale Study (Hardy, 2013). Therefore, it would be beneficial to consider the motivational variations at different career stages so that companies can adapt, as needed, to employee needs. Lastly, the study investigates differences in job satisfaction among the groups of women. How might specific motivational factors fit into these ratings? What can companies do or provide to their employees to help maintain high job satisfaction levels?

The data for this study is gathered using Q methodology with the goal of identifying shared views across the population. The population for this study is women who work in a high tech organization. The sample is a group of women who work in various roles at a single technology company. While the company has over 5,000 employees worldwide, this sample is limited specifically to the company’s Raleigh, North Carolina headquarters. The unit of analysis for this study is the individual female.

Theoretical Framework

Several theories attempt to explain motivational factors as they relate to employees. For purposes of this study, the theoretical framework selected as a basis for developing the research questions and methods is Herzberg's two factor theory of motivation. The primary rationale behind selecting this as the theoretical framework is Herzberg's association of employee motivation to employee attitudes. He proposed that an "employee's motivation to work is best understood when the respective attitude of that employee is understood" (Tietjen & Myers, 1998, p. 226). Herzberg's seminal 1959 study focused on answering three questions:

1. How can one specify the attitude of any individual toward his or her job?
2. What causes these attitudes?
3. What are the consequences of these attitudes?

Through qualitative investigation and quantitative analysis of the data, Herzberg came to a conclusion that two sets of factors influenced an employee's level of satisfaction with their job. He labeled these two sets of factors "motivators" and "hygiene factors." Motivators include recognition, achievement, growth potential, and responsibility, and "refer to factors intrinsic to the work itself" (Tietjen & Myers, 1998, p. 226). Hygiene factors "are characterized as extrinsic components of job design" and may include salary, work relationships, working conditions, and job security (Furnham & Eracleous, 2009, p. 766). Herzberg theorized that motivators foster positive attitudes toward an employee's job because they satisfy the need for self-actualization (Herzberg, 1959). Alternatively, hygiene factors have the potential to cause greater dissatisfaction with one's job. According to

Herzberg, the absence of motivators does not cause dissatisfaction, nor does the absence of hygiene factors result in job satisfaction; “the opposite of job satisfaction is not dissatisfaction, but rather a simple lack of satisfaction” (Herzberg, 1968; Tietjen & Myers, 1998). Herzberg’s conclusion can help organizations align job structures and their work environment with the motivators that directly impact job satisfaction.

Because this study seeks to collect and interpret how women view the importance of various motivational factors and the subsequent effect they have on their job satisfaction, Herzberg’s two factor theory provides an initial framework for categorizing the most common factors for interpretation. Through the Q methodological approach, this study captures the rankings of numerous motivational factors by women and considers the broader motivator (intrinsic) and hygiene factor (extrinsic) categories during analysis. Through a supplemental survey, participants rated their current job satisfaction, which will be compared to the factor groupings. While Herzberg did not include gender as a variable in his research, this study compares women’s views on motivational factors with their job satisfaction to see if there is a correlation like Herzberg believed.

Literature Review

The scholarly literature reviewed for this study pertained to employee motivational factors and job satisfaction, both of which contribute to a comprehensive understanding of the elements involved in the research.

The literature review is a key element to a Q methodology study given that the concourse items are selected from the breadth of perspectives offered by scholarly writers and researchers, as well as interviews and popular literature. The material represents “existing opinions and arguments, things lay people, politicians, representative organisations, professionals, scientists have to say about the topic; this is the raw material for Q” (van Exel, 2005, p. 4). For this study, the primary goal of the literature review is to collect the most commonly perceived motivational factors in a professional setting. The concourse item selection from existing literature will be discussed at greater detail in the following section on research methods.

The literature was selected through several searches on the North Carolina State University Library System. The search terms “employee motivation” returned over 146,000 results. “Motivation and job satisfaction” returned over 67,000 search results. “Motivational factors for women” returned over 38,000 search results. “Workplace motivational factors” returned over 11,000 results. The string “extrinsic intrinsic motivation women” returned over 5,000. In addition to incorporating the terms “women” and “female” into the query, to further narrow down these search results, the researcher mainly focused on publications from the past twenty years. Because of limited time and resources, a relatively small subset of this literature was reviewed for this study.

Motivational Factors

The term motivation, as it will be interpreted for this study, is defined as “an internal state...giving rise to a desire or pressure to act” (Westwood, 1992, p. 288). A great deal of

research has been conducted on motivational factors in a professional setting, while little to no research has been conducted on motivational factors relating to female employees in technology. Resulting studies target a variety of industries or job functions. Raman, Anantharaman, and Ramanathan (2013) focused their study on differences in motivational factors on Malaysian women and whether or not these factors, along with environmental and personality factors, can be predictors of women entrepreneurship. In a 2009 study, Kirkwood also looked at the effect of motivational factors on entrepreneurship and how they differ for men and women. Yurkstseven (2012) considered how motivational factors affect employee job satisfaction in the hotel industry. Aarabi, Subramaniam, and Abu Baker Akeel (2013) focused specifically on the service industry. Hildebrandt and Eom (2011) focused on motivational factors as they pertain to teaching professionals.

Additional frequently seen variables include gender (Kirkwood, 2009; Humbert & Drew, 2009), geography (Aworemi, Abdul-Azeez & Durowoju, 2011; Raman, Anantharaman, & Ramanathan, 2013), and age (Hildebrandt & Eom, 2011). For purposes of this study, the data analysis will seek to correlate motivational factors and job satisfaction for women in the high tech industry. The geography will be limited to a United States perspective. The only consideration of age in the study will be seen in the demographics segment of the participant survey through questions on participant birth year and the longevity of the participant in their current position and in the technology industry. From this information, the researcher will explore how women at various career points share or differ in views toward motivations. Are there similarities in the way participants rank the

concourse items? Do their rankings align with Herzberg's two factor theory in that there is a natural distinction between motivators and extrinsic, or hygiene, factors?

Additional research is seen on specific motivational factors and, from these, the concourse for this study was selected. Pool investigated the values of leadership on work motivation and, subsequently job satisfaction, in 1997. Studies focused on relationships with colleagues and with the family as motivating factors (Tsai, Yen, Huang & Huang, 2007), total compensation packages (Igalens & Roussel, 1999), job characteristics and job involvement (Lawler & Hall, 1970; Cummings & Bigelow, 1976), pay satisfaction (Chiu, 2000), and personal control on employee job-performance and satisfaction (Orpen, 1994). In a 2008 study on "Motivational Orientations in Work," researchers Murtonen, Olkinuora, Palonen, Hakkarainen, and Lehtinen found that different types of organizational environments stem different types of motivations in employees. For their research, "the key finding is that rapidly changing, increasingly complex, and fundamentally networked organisations are challenging environments for worker motivation" (Murtonen, Olkinuora, Palonen, Hakkarainen, & Lehtinen, 2008). Some of these organizational environments are characteristic of technology companies. Raman, Anantharaman, and Ramanathan (2013) also looked at environmental factors and personality on motivations for entrepreneurship. Kirkwood's 2009 study on the gender differences in motivational factors for entrepreneurship found that men and women are similarly motivated by combination of push and pull factors. However, there were three gender differences of note: 1) women were more influenced by desire for independence, 2) women considered their children as motivators more so than men, and 3) men were more influenced by job dissatisfaction than women.

While much of the research focuses on positive motivational factors, it is also necessary to consider how negative factors may affect employee motivation as seen through push-pull theory. Pull factors, characterized similarly to Herzberg's motivators, are those that draw people to do something. For Kirkwood's research (2009), pull factors draw individuals to start a business. Push factors are less prevalent, are characterized by personal or external factors, and most frequently have a negative connotation (Kirkwood, 2009, p. 346). Examples of push factors include divorce, family obligations, or being overlooked for a promotion. These opposite factor categories are especially relevant when looking at gender differences and previous research has suggested that women are more motivated by push factors than by pull factors (Clain, 2000; Orhan & Scott, 2001). This will be explored in the Results section of this study.

Through this review, close to one hundred motivational factors were presented and selected as a basis for the initial concourse items for the Q-methodological study. The researcher followed the lead of many of the scholars in categorizing or grouping the factors into overarching themes, loosely based on internal and external characteristics. The concourse items and categorization rationale will be discussed in the Research Methods section of this proposal.

Job Satisfaction

Warr (2002) defines job satisfaction as "the extent to which people are satisfied with their work" (p. 1). This concept is the target of numerous studies (Yurtseven, 2012; Huang & Van de Vliert, 2003; Pellegrini & Scandura, 2006; Firestone, Garza & Harris, 2005; Huang

& Van de Vliert, 2004; Thomas & Pekerti, 2003) that investigate the effect of job satisfaction on the workplace and has recently been of interest as there has been an increase in the importance of efficiency as “a factor affecting the management of contemporary business in today’s world” (Yurtseven, 2012, p. 72). Scholars have conducted research on employee job satisfaction as it relates to cultural variables, including country wealth and welfare programs (Huang & Van de Vliert, 2003), paternalism (Pellegrini & Scandura, 2006), Protestant work ethic and collectivism (Firestone, Garza, & Harris, 2005), individualism (Huang & Van de Vliert, 2004), and the promotion of nationalism (Thomas & Pekerti, 2003).

Several studies have also explored the relationship between job satisfaction and employee motivational factors, yet there still lacks a universally accepted theory given the complexities of motivation (Yurtseven, 2007; Tzeng, 2002; Becherer, Morgan & Richard, 1982; Hunt, Head & Sorensen, 1982; Wabha, 1978; Ma & MacMillan, 1999). In a 2011 study, Yurtseven conducted research on the causes of motivational problems related to employee duties in Turkey, consisting of analyzing twenty-seven factors regarding employees’ attitudes toward job satisfaction. The research found that employees value behavioral approaches and that the least importantly rated issues for employees were the lack of information about company policy and working beyond normal hours (Yurtseven, 2007). Like the motivational factor studies previously described, many of these joint studies target specific industries or lines of work. Tzeng (2002) linked work environment to job satisfaction and good outcomes in the nursing field. Other studies explored job characteristics, motivation and job satisfaction in industrial sales (Becherer, Morgan & Richard, 1982), job characteristics, job satisfaction, motivation and context in hospital

pharmaceuticals (Hunt, Head, & Sorensen, 1982), motivation, performance and satisfaction for librarians (Wabha, 1978), and workplace conditions and job satisfaction in teaching (Ma & MacMillan, 1999).

Self-determination theory contributes to many researchers' theoretical frameworks for these studies. According to this theory, "autonomy, relatedness, and competence are three intrinsic psychological needs that, if fulfilled in the workplace, will lead to greater satisfaction, performance, and general well-being" (Deci & Ryan, 1985). Some consequences of job satisfaction include organizational commitment, organizational citizenship behavior, and employee well-being, while consequences of job dissatisfaction are absenteeism and turnover (Ghazzawi, 2010, p. 7).

Many job satisfaction instruments have been developed over the past few decades, but this study uses the Minnesota Satisfaction Questionnaire "MSQ" short form as a basis because of its simplicity and length. A 2010 study conducted by Ghazzawi on job satisfaction and gender in U.S. technology professionals utilized the MSQ short form, finding that gender does not play a role in job satisfaction and that IT professionals tend to be extrinsically satisfied overall (Ghazzawi, 2010, p. 21). This questionnaire, "one of the most popular and frequently used instruments for measuring job satisfaction" is comprised of 20 questions covering intrinsic, extrinsic and general job satisfaction that participants respond to by selecting their level of satisfaction or dissatisfaction on a five-point scale (Ghazzawi, 2010, p. 15). On this scale: Very dissatisfied = 1; dissatisfied = 2; neither satisfied or dissatisfied = 3; satisfied = 4; and very satisfied = 5. The job satisfaction questionnaire used for this study

will be discussed in greater detail in the Research Methods section and can be found in Appendix D.

Research Questions

As seen in the extensive research that has already been conducted in the area of employee motivations, there are several different variables that this study could incorporate. However, to simplify the purpose and limit the scope, this study focuses on answering the following research questions:

1. What are the viewpoints on motivational factors for women who work in a high tech organization?
2. For each motivational group, what are the highest and lowest rated motivations?
3. Do women who have worked at technology organizations for different periods of time share a similar view of motivation?
4. Do women who fall within different motivational groups have different job satisfaction levels?

Research Design – Methods and Procedures

The following section will discuss the research methods and procedures used for this study. It was determined that one unique and appropriate approach for obtaining data relating to motivational factors for women in a high tech organization is through a Q methodological study as Q is a preferred method for researchers who are studying attitudes (Simons, 2013, p. 28). Q methodology, created in 1935 by William Stephenson, allows

researchers to uncover how and why people think the way they do (DeWeese, 2012, p. 47). It can be useful in exploring “tastes, preferences, sentiments, motives and goals” (Van Exel & de Graaf, 2005, p. 2). In this case, the intent is to, not only establish what are the key common motivational factors on women in technology, but to gain a better understanding of how these factors relate to a women’s job satisfaction. A greater understanding of this will help technology companies to provide better opportunities to their female employee base, tailoring these opportunities to meet the needs of this specific group.

Outcomes of Q methodology may include the identification of important internal and external constituencies, defining participant perceptions, and providing insight into these shared or differing perceptions (DeWeese, 2012, p. 48). This approach focuses on the collection of statements or perspectives on a given area of interest, in this case motivational factors. The various perspectives are organized into subgroups based on “similarity of opinion” and are then analyzed to “generate thematic results” (DeWeese, 2012, p. 49). Q methodology is comprised of five main steps, which will be discussed in greater detail below. In a brief summary, a sample of statements taken from the literature review, or the Q-set, is presented to a group of participants. The participants, the P-set, are asked to rank the statements from their perspectives. In this Q-sort process, “people give subjective meaning to the statements, and by doing so reveal their subjective viewpoint or personal profile” (Van Exel & de Graaf, 2005, p. 1). In his basic handbook, *Political Subjectivity* (1980), Steven Brown provides the following overview of Q methodology:

Most typically, a person is presented with a set of statements about some topic, and is asked to rank-order them (usually from ‘agree’ to ‘disagree’), an operation referred

to as “Q sorting.” The statements are matters of opinion only (not fact), and the fact that the Q sorter is ranking the statements from his or her own point of view is what brings subjectivity into the picture. There is obviously no right or wrong way to provide “my point of view” about anything... Yet the rankings are subject to factor analysis, and the resulting factors, inasmuch as they have arisen from individual subjectivities, indicate segments of subjectivity which exist. And since the interest of Q methodology is in the nature of the segments and the extent to which they are similar or dissimilar, the issue of large numbers, so fundamental to most social research, is rendered relatively unimportant.

Step 1: Define the Concourse

The first step in a Q methodological study is to develop the concourse, or collection of statements, through a complete review of literature on the subject. The concourse, in other words, is the “collection of all the possible statements the respondents can make about the subject at hand” (Van Exel & de Graaf, 2005, p. 4). Once the statements are selected, they are organized into broad thematic categories. In this study, the researcher collected statements pertaining to employee motivational factors through a comprehensive review of the scholarly and contemporary literature on the subject.

Step 2: Develop the Q-Set

In the development phase of the Q methodological approach, the concourse items are further narrowed down into a final Q-set. This refinement removes any extraneous or

repetitive statements. As seen in DeWeese's Q methodological study on the characteristics of successful Olympic level coaches, this editing process "can be completed by allowing domain experts to review the statements, performing a pilot study, or through a random sample of statements." DeWeese was able to narrow his original collection of statements to 34 concise items. The recommendation is to select a Q-set that represents a wide range of opinions on the topic, generally consisting of 40 to 50 statements (Van Exel & de Graaf, 2005, p. 5). This study involved a final Q-set consisting of 75 statements.

Step 3: Select the P-Set

The P-set, or the research participants, is commonly comprised of a smaller number than the Q-set. The smaller sample size is one of the benefits to conducting a Q methodological study: "Q does not need numbers of subjects, for it can reveal a characteristic independently of the distribution of that characteristic relative to other characteristics" (Van Exel & de Graaf, 2005; Smith, 2001). The P-set for this study was generated from an email solicitation to the participating company's North American headquarters' women's group listserv. The final number for this study's P-set was 18. These female participants "are expected to have a clear and distinct viewpoint regarding the problem and, in that quality, may define a factor" (Brown, 1980).

Step 4: Q-Sorting

In the Q-Sorting phase, the P-set is asked to complete an initial sort of the Q-set by dividing the statements into three piles: Agree, Disagree, and Neutral. It is important to note

that the final Q-set has random number assignments for tracking purposes. Once the piles are created, the respondent “rank orders the statements according to the condition of instruction,” in this case the level of agreement, and enters the corresponding statement number into the worksheet found in Appendix F (Van Exel & de Graaf, 2005, p. 7). This phase of the process concludes with a brief follow-up survey to obtain greater detail on the rankings and selections the participants made. Participants were also asked to complete a demographic and job satisfaction questionnaire. Samples of these items are found in Appendix B, Appendix C, and Appendix D.

Step 5: Analysis and Interpretation

According to van Exel, the analysis of the Q-sort is a purely technical, objective procedure, and is therefore sometimes referred to as the scientific basis of Q (Van Exel & de Graaf, 2005, p. 8). To begin, the researcher calculates the correlation matrix of all Q-sorts. This is followed by factor analysis to identify natural groupings of either similarities or dissimilarities. Van Exel and de Graaf (2005) explain it as:

People with similar views on the topic will share the same factor. A factor loading is determined for each Q-sort, expressing the extent to which each Q-sort is associated with each factor. The number of factors in the final set depends on the variability in the elicited Q-sorts.

In the last two stages of analysis, the researcher performs a factor rotation and a factor score. The factor rotation is designed to maintain as much variance as possible. In this step, the original set of factors is rotated to arrive at a final set of factors. Van Exel and de

Graaf (2005) describe this rotation as objective, done according to a statistical principal, or theoretical or judgmental, performed based on the researcher's prior knowledge or preconceived idea about the topic. These rotations allow the researcher to see opinions from different angles and each resulting final factor "represents a group of individual points of view that are highly correlated with each other and uncorrelated with others" (Van Exel and de Graaf, 2005, p. 9).

Once the rotation is completed, the researcher calculates factor scores and differential scores. These z-scores define a given factor and can be added back to the distribution to provide a composite Q-sort for each factor (DeWeese, 2012, p. 54).

Participants

In order to obtain the viewpoints and perceptions of women who work in a high tech organization, the North American headquarters' women's affinity group of a single technology company was sent an email communication to solicit participants for this study (see Appendix A). Within the company, these women represent various corporate departments, functional roles, tenures, and work styles. On a personal level, they represent different geographies, ages, educational backgrounds, family situations, and career paths.

Sample

Given that Q methodology does not require a large sample group, the number of participants for this study's sample is 18. This convenience sample is determined by those

who opted to participate based on the email communication. Of the 363 women who received the original email solicitation, 18 actually participated in the study.

Instrumentation

To measure participants' beliefs concerning motivational factors, a concourse was developed. The concourse items were selected as a result of a conclusive literature review of existing studies and current popular literature on the subject. Initial concourse items were taken from scholarly literature, opinion pieces, and contemporary nonfiction writing. This initial list consisted of 91 items, which were grouped into five categories based on broader themes and loosely tying to Herzberg's internal and external themes. The overarching themes for this initial concourse set include: tangible factors (monetary or benefits-related), external obligation factors (personal or family-related), self-fulfillment factors (status, career growth, or recognition), organizational and social factors (organizational culture and environment), and work/task-specific factors (characteristics of the work itself).

To create the final Q-set, the list was narrowed down to remove any duplicate statements or redundancies. The final list of concourse items included 75 statements on motivational factors. This list followed the same categorization into broader themes as described above. The final list can be seen in Appendix D.

In addition to the concourse list, participants were given a free-form questionnaire to complete at the conclusion of their sorting. This questionnaire was designed to collect demographical information. Participants were also given a job satisfaction questionnaire, the Minnesota Satisfaction Questionnaire "MSQ"-20-item short form, asking them to rank their

level of satisfaction on a scale of 1 to 5, 5 being very satisfied. In this questionnaire, participants were provided with an area for free response should they wish to elaborate.

Data Collection

Prior to commencing the data collection segment of this study, the researcher obtained approval from the Institutional Review Board (IRB) of North Carolina State University on February 4, 2014. A copy of the approval is found in Appendix G. Once this approval was obtained, the researcher followed the Q methodological approach as described in previous sections with the ultimate goal of exploring a group of females' preferences and opinions on motivational factors in the workplace.

Volunteer participants were identified through an electronic solicitation to the company's "Women's Leadership Community" email group. This group includes all full-time female employees who work in the company's Raleigh, North Carolina office. As part of this initial email communication, potential participants were provided details on the purpose of the study, a description of what their role entails, and contact information to address any ethical or privacy concerns.

Once participants committed to taking part in the study, the researcher scheduled three separate in-person sessions to administer the Q-sort. These sessions took place at the company's Raleigh office in a conference room; there were no more than 12 people in attendance so that the researcher could effectively explain the process and answer any questions as they came up. At each of these sessions, prior to the sorting process, participants were provided with the Informed Consent Form that is required for participation in the study.

Then, the researcher provided a brief introduction and overview (5 to 10 minutes) of the process before asking the participants to begin sorting. Each of the sessions lasted approximately one hour. From the time that the researcher sent the initial Participant Introduction Letter on February 18, 2014, all Q-sorts were completed within a three-week period by March 6, 2014.

Once the participants completed their Q-sort, they were assigned a random identification number for entry into an Excel spreadsheet for the data analysis phase. All data was kept in a password protected Excel spreadsheet on the Company's private and secure server.

Data Analysis

When all data was collected via the in-person administration, the data analysis phase began by consolidating the data into a statistical software program, SPSS. The researcher then conducted various statistical analyses, including factor analysis, through SPSS.

Results

The following section provides an overview of the data that was collected through the means described above. Eighteen participants completed the Q-sorts to determine how women who work in a high tech organization share or do not share similar views toward factors that motivate them. To reiterate, the selection of Q methodology for this study centers on its purpose to "determine relationships between commonly held opinions on a specific topic" through the correlation of "personal profiles that are elucidated through the

statement sort in order to determine common viewpoints or segments of subjectivity” (DeWeese, 2012, p. 61). This results section will set out demographical information on the sampled population and correlations between the sorts, as well as an overview of the factor analysis, factor rotation, factor arrays, defining statements, and the factor interpretations.

P-Set Demographics

Eighteen female participants completed the Q-sort process. All of the participants currently work at the same high tech organization, although they fall within a wide range of job functions. The corporate functions, or departments, with the highest number of participants were Legal (3), Marketing (4), and IT (3). The breakdown of functional area or department for the sampled population is found in Table 1.1. The participants were also asked whether or not they held a leadership role at the company and, if so, whether it was part of their current position (manager or supervisory role) or if they served in a leadership capacity in an alternative function (project management or company committee chair). There was a close division between those who did and did not hold leadership positions: 44.44% did and 55.56% did not (see Table 1.2).

In terms of age, Table 1.3 lists the year of birth for each participant. Based upon this data, the age for the average participant at the time this survey was conducted was 38. The youngest participant, born in 1989, was 25 years old. The oldest participant, born in 1951, was 63.

This study also collected data on how long each participant had been working at this particular high tech organization and the length of time each had worked in the technology

sector. The data seen in Table 1.4 supports the earlier statistics of the technology sector's high turnover rate, showing that exactly 50% of the participants worked in the technology sector prior to joining the current company. On average, the number of years worked at the current technology company is 3.991 with a standard deviation of 3.178. On average, the number of years worked in the technology sector is 8.277 with a standard deviation of 7.070. Participants were not asked how many different technology companies they worked at over the course of their professional career.

Tables 1.5 and 1.6 provide the breakdown of participant marital status at the time of the data collection and whether or not the participant is the primary source of income for their household. The majority of participants are either married (66.67%) or single (16.67%). For the participants who are married, one-third is the primary breadwinner for their household.

Table 1.1

Breakdown of functional area or department for sampled population

Functional Area	f	%
Legal	3	16.67%
Operations	1	5.56%
Sales	2	11.11%
Finance	2	11.11%
Marketing	4	22.22%
IT	3	16.67%
Facilities	1	5.56%
Engineering	1	5.56%
Customer Support	1	5.56%

Table 1.2

Breakdown of whether sampled population holds a leadership role

Leadership Role	f	%
Yes	8	44.44%
No	10	55.56%

Table 1.3

Age of sampled population at time of study

Participant	Age
1	42
2	40
3	32
4	45
5	35
6	51
7	63
8	42
9	26
10	41
11	25
12	26
13	31
14	35
15	46
16	34
17	40
18	30

Table 1.4

Years worked at current technology company compared to length of time working in technology sector

Participant	Length of time with the company	Length of time working in the technology sector
1	12 years	14 years
2	7 years	7 years
3	8.5 years	8.5 years
4	7 years	20 years
5	5 years	12 years
6	9 months	9 years, 9 months
7	3 years	3 years
8	7 years	25 years
9	6 months	3 years
10	2 years	2 years
11	2 years	2 years
12	2.5 years	2.5 years
13	2.5 years	2.5 years
14	5 years	14 years
15	11 months	11 months
16	3 years	6 years
17	1.5 years	15 years
18	20 months	20 months

Table 1.5

Breakdown of marital status for sampled population

Marital Status	f	%
Single	3	16.67%
Married	12	66.67%
Divorced	2	11.11%
Widowed	1	5.56%

Table 1.6

Breakdown of primary source of income for household by marital status

Primary Source of Income	f	%
Single	3	100%
Married	10	55.56%
Divorced	2	100%
Widowed	1	100%

Correlation Between Sorts

To analyze the Q-sorts, it is necessary to first calculate the correlation matrix to determine differences in the points of view between the participants. Through an in-person Q-sort administration, 18 female employees at a high tech organization were asked to sort and rank their perceptions of 75 items or statements concerning motivational factors. Clusters of these concourse items illustrate various perspectives toward motivational factors. Following DeWeese’s analysis of Q-sort data concerning the constructs of expert Olympic level coaches, the researcher utilized SPSS software to generate a correlation matrix of the 18 individual Q-sorts (DeWeese, 2012, p. 66). This correlation matrix shows how each Q-sort compared and related to the Q-sorts of the other participants. This exercise was conducted to “determine the variability of the [18] Q sorts in order to determine how many shared factors are in evidence” (DeWeese, 2012, p. 66). Sorts with a correlation of 1.00 demonstrate perfect agreement, while a correlation of -1.00 demonstrates perfect negative agreement. When analyzing the correlation matrix, the researcher looks for Q-sorts that are as close to

1.00 as possible as they will have shared views toward the motivational factors listed in the concourse.

Factor Analysis and Factor Rotation

Using SPSS and under advisor supervision, the researcher used factor analysis to determine how many different groupings, or families, exist based on similarities of responses by the research participants. The next step in the process is conducting a factor rotation, which results in various family outcomes. In this particular study, SPSS used varimax with kaiser normalization. The factor rotation resulted in three families that are seen in Table 1.5. Nine research subjects make up Factor A; five make up Factor B; four comprise Factor C. Table 1.6 also provides certain demographical data based on these factor loadings and as compared to the full sample population. Here, two new elements are introduced to the demographical data: the average number of children and the average job satisfaction rating based on the Minnesota Satisfaction Questionnaire “MSQ”-20-item short form.

Table 2.1

Factor Loading of Subject Responses to Motivational Factors

Participant	Factor A	Factor B	Factor C
16	0.778		
15	0.765		
17	0.736		
11	0.663		
7	0.608		
1	0.548		
8	0.54		
5	0.498		

Table 2.1 Continued

Respondent	Factor A	Factor B	Factor C
18	0.473		
10		0.833	
13		0.643	
3		0.641	
6		0.64	
9		0.517	
14			0.86
2			0.627
4			0.592
12			0.481

Table 2.2

Descriptive Statistics for Factors / Groups

		Year of Birth	Years with Company	Years in Technology Sector	Number of Children	Job Satisfaction Rating
Factor A	Mean	1974	4.01	8.8433	1.0000	4.0000
	SD	10.943	3.556	8.206	.527	1.22
Factor B	Mean	1977.8	2.85	5.15	1.6000	4.0000
	SD	9.884	3.267	3.672	.447	.707
Factor C	Mean	1977.5	5.375	10.875	0.7500	3.7500
	SD	8.103	2.136	7.706	.957	.500
Total	Mean	1976	3.9911	8.2689	1.1111	3.9444
	SD	9.689	3.178	7.070	.511	.937

Factor Arrays

The next step in the Q methodology process provides an opportunity to see how each of the 75 concourse items compares across the three factor loadings. Each concourse

statement is given a z-score, or factor score, by SPSS. These factor scores are weighted “based on how strongly they correlate to that factor” (DeWeese, 2012, p. 69). In this instance, the factor scores have been rounded up to whole numbers to more easily see comparisons between the factor loadings. In the study, participants were asked to group and rank the 75 concourse statements on a scale of -6 to +6, therefore, the numbers listed in Table 1.7 fall within this scale and assist the researcher in interpreting the data and creating overarching themes.

Table 3.1

Factor Arrays

		Factor A	Factor B	Factor C
T1	Material or Financial Reward	1	0	0
T2	Job Security	0	-1	3
T3	Work Hours Per Week	0	-1	2
T4	Total Compensation	2	3	2
T5	Pay Satisfaction	2	3	2
T6	Total Benefits Package	1	2	0
T7	Bonuses (Annual, Quarterly, etc.)	1	3	-2
T8	Insurance (Health, dental, life, etc.)	1	2	3
T9	Perks (Flex hours, working from home, tuition reimbursement, gym discount, etc.)	2	2	1
T10	Opportunity for Promotion or Career Advancement	2	2	2
E1	Job Security for Family	0	2	3
E2	Relationship with Family	-2	3	1
E3	Job Effect on Family	-2	2	3

Table 3.1 Continued

		Factor A	Factor B	Factor C
E4	Family Obligations (Sense of duty, commitment)	-2	2	1
E5	Children	-4	3	1
E6	Other Personal Life Factors	-2	-1	0
E7	Spouse's Job Characteristics (Salary, hours, etc.)	-3	-2	-2
S1	Personal Growth	1	0	3
S2	Self-Actualization (Ability to realize your full potential)	0	1	0
S3	Personal Achievement	1	0	1
S4	Prestige	-1	-4	-1
S5	Job Autonomy or Independence	3	0	1
S6	Feeling of Duty (To yourself, family, society)	-3	1	-2
S7	Overcoming Anxiety	-3	-4	-4
S8	Dissatisfaction at Previous Job(s)	-3	0	-5
S9	Feeling of Power in Current Role (Over self or others)	0	-1	0
S10	Leadership Opportunities	1	2	1
S11	Personal Control (Over your career path)	1	1	-1
S12	Flexibility in How Work Gets Done	2	1	2
S13	Fear of Unemployment	-2	-2	-2
S14	Lack of Other Career Prospects	-3	-2	-3
S15	Work/Life Balance	1	4	5
S16	Comfort in Current Role	0	-3	-1
S17	Internal Competition	-3	-3	-2
S18	External Competition	-3	-3	-2
S19	Your Work's Contribution to Society	-1	1	-3

Table 3.1 Continued

		Factor A	Factor B	Factor C
S20	Performance Recognition	2	3	1
S21	Job or Career Status	0	-1	1
S22	Stimulation by Work	2	1	2
S23	Passion for Work	3	2	1
S24	Work's Contribution to Positive Self-Image	1	-2	2
S25	Work's Alignment with Personal Beliefs and Values	1	1	3
S26	Work's Alignment with Personal Goals	1	1	3
O1	Supervisor Feedback	1	2	0
O2	Social Identity or Sense of Belonging to a Group	-1	0	-2
O3	Working in Groups	-1	-2	-2
O4	Your Company's Involvement with the Community (Charitable contributions, volunteer opportunities, etc.)	-2	-1	-2
O5	Company Policy Communication	-3	-2	-4
O6	Relationship with Colleagues	2	3	1
O7	Being Helped by Supervisor	-1	-1	-3
O8	Workplace Conditions (Seating, comfort, safety, etc.)	0	-2	-2
O9	Office Location	0	-2	-1
O10	Organizational Brand or Image	1	0	-1
O11	Current Level of Supervision by Manager	0	0	-2
W1	Working to Solve Bigger Problems	1	-1	1
W2	Challenging Nature of Work	4	0	2
W3	Opportunities for Continuous Learning on the Job	1	0	3

Table 3.1 Continued

		Factor A	Factor B	Factor C
W4	Opportunities for Continuous Learning from Colleagues	0	-1	1
W5	Job Characteristics (Specific job function, daily responsibilities)	0	-1	0
W6	Redundancy (Performing the same tasks over and over again)	-3	-1	-2
W7	Job Involvement (Engagement and enthusiasm)	4	1	3
W8	Changing World of Work (External factors including technology, work environment, globalization, virtualization)	-1	0	-3
W9	Clarity in Job Role and Responsibility	1	0	-1
W10	Ease of Work/Comfort in Role	-1	-3	-2
W11	Necessary Equipment is Available to Help you Perform Your job effectively	0	-1	-3
W12	Job is intellectually challenging (Opportunities to problem solve)	5	2	3
W13	Regularity of work (consistent workflow, predictable and manageable busy cycles)	-2	-1	-2
W14	Simplicity in work tasks	-3	-3	-3
W15	Opportunity to Teach Others	0	1	0
W16	Stress (Environment or work itself)	0	-1	2
W17	Variety of Work	1	1	0

Table 3.1 Continued

		Factor A	Factor B	Factor C
		0	0	0
W18	Visibility in the Workplace			
W19	Skill Mastery	0	-2	0
W20	Behavioral Consequences Stemming from Work or Supervisor (Positive or negative reinforcement)	0	-1	-1
W21	Intrinsic Task Value	-1	-3	-1

Defining Statements

As part of the data analysis, the researcher looked at what concourse items are unique to each of the three factors, specifically what were the highest and lowest rated factors.

These anchor statements were the concourse item statements found at the -6 or +6 positions of the arrays and are considered most or least important by the survey participants. These statements will assist in defining themes for each motivational group, which will be discussed in the following section. Table 1.9 illustrates the highest rated statements and Table 1.10 outlines the lowest rated statements.

Table 4.1

Highest Rated Statements for Each Factor

Factor	Highest Rated	2nd Highest Rated	3rd Highest Rated
A	Job is intellectually challenging (Opportunities to problem solve)	Passion for Work	Job Autonomy or Independence

Table 4.1 Continued

Factor	Highest Rated	2nd Highest Rated	3rd Highest Rated
B	Performance Recognition	Relationship with Family	Work/Life Balance
C	Work/Life Balance	Personal Growth	Opportunities for Continuous Learning on the Job

Table 4.2

Lowest Rated Statements for Each Factor

Factor	Lowest Rated	2nd Lowest Rated	3rd Lowest Rated
A	Children	Spouse's Job Characteristics	Internal Competition
B	Prestige	Your Company's Involvement with the Community	Comfort in Current Role
C	Spouse's Job Characteristics Your Company's Involvement with the Community External Competition Prestige*		

*All statements under -6 for Factor 3 were different.

Group Interpretation

This data analysis explores the similarities and differences in views toward motivational factors between the three factor loadings. Because a factor loading is

considered to be a “family” with similar thoughts or beliefs on this specific topic, the researcher developed three primary factors or themes that correlate with the three factor loadings. These themes were defined through various statistical measures, including factor arrays, anchor statements, and qualitative responses from the post-sort questionnaires.

The three emerging themes obtained from this analysis are identified as: (a) women driven by intrinsic values of work, (b) women driven by external obligations and validation, and (c) women driven by time management control. Descriptions of these three factors are provided below, as well as the demographics for the factor loadings and select statements from the post-sort questionnaires.

Factor A: Women driven by intrinsic values of work. Factor A accounted for the largest variance in the study, 50%, with 9 of the 18 respondents loading onto this factor. As seen in Table 1.6, the mean year of birth for the women in this factor is 1974. As compared with the other factors, this was the oldest group. Women in this factor averaged approximately 4 years with the company, but spent twice as much time of their professional career in the technology sector (8.84 years). This means that a number of them worked at technology companies in addition to their present employer. The mean number of children that women had in this factor was 1. The mean job satisfaction rating was 4 out of 5, or “satisfied” when asked about their current position.

In looking at the factor arrays (see Table 1.7) for Factor A, the three highest z-scores tied to three of the items found in the “Work and Task Specific Factors” theme: Job is intellectually challenging (z-score of 5), challenging nature of work (z-score of 4), and job involvement/engagement and enthusiasm (z-score of 4). This data, combined with their

highest rated statements seen in Table 1.9 and the free responses collected in the post-sort survey, indicate a strong pull toward motivations stemming from seeking knowledge, challenge and passion. In contrast, the lowest z-scores and anchor statements involved redundancy and simplicity in tasks, children, and spouse's job characteristics. For those who ranked children and the spouse's job at -6, it was because they did not have either and felt that "the relevance is low."

Participant 1, a 12-year veteran of the company, wrote "I am driven and motivated primarily by knowledge and a deep curiosity about everything. I need to know how things work, why things are and how they relate. I get excited about complex problems that seem to have no solution." Participant 7 wrote, "My passion for my work explains why I do what I do. Without passion, it would just be a job, not a career." Other recurring elements seen in the post-sort survey were discussion on "the exciting, creative and intellectual experience" (Participant 8), the importance of feeling challenged, and "taking on challenging material" (Participants 15 and 11).

These types of factors fit into Herzberg's "motivators" category, referring to factors intrinsic to the work itself. With a mean job satisfaction rating of 4, it does appear that the women who are motivated by knowledge and passion are satisfied with their job. In fact, of the 4 women who rated their current level of satisfaction at 5, or "Very Satisfied," 3 of them were in Factor A.

Because these women are motivated by intangible factors and self-driven factors, it is important for the company to explore ways that they can continue to provide stimulating and challenging work in order for Factor A to remain engaged.

Factor B: Women driven by external obligations and validation. This factor accounted for 27.7% of the variance in this study and was comprised of 5 of the 18 participants. The mean year of birth for this group was 1977.8, which is comparable to the mean year of birth for Factor C (1977.5). Factor B, however, had the least experience in the company (2.85 years) and the technology sector (5.15 years). Interestingly, they also had the highest number of children with a mean of 1.6. Their mean job satisfaction rating was 4 or “Satisfied.”

What stands out most for this group in looking at the factor arrays and responses to the post-sort survey is the impact others have on their motivation. This factor values family, work/life balance (so they can be with their family), and recognition or validation from others: “Receiving recognition validates the work that I do” (Participant 10). As seen in the response from Participant 3, “I tend to be a people pleaser...this caused me to always drive for recognition...and has carried into my adult life.” Participant 6 also wrote, “My relationship with my family is of most importance to me. The things I do in my life are impacted by my relationship with my family.”

While the highest rated anchor statement of “performance recognition” and the lowest rated anchor statement of “prestige” were not sorted by the same person, it is interesting to note that these two seemingly opposing views were found in the same factor loading. Participant 6, who assigned “prestige” under -6 wrote, “Prestige is not of great importance to me. To me, it is something that is defined by some external factor that society places great weight upon. Desiring prestige or a prestigious job or title is not a motivator for me.” Again, interestingly, Participant 6 assigned the external “hygiene” factor of family under +6,

splitting her highest and lowest rated items according to Herzberg's hygiene (family) and motivator (prestige) categories.

What sets Factor B apart from the other two families is that what they deem as their greatest motivational factors are, according to Herzberg, "motivators" and "hygiene" factors. Motivators are seen in the recognition statements, while hygiene factors include family and relationships. Even with a combination of the two, this factor still averages a high job satisfaction rating of 4. Perhaps the women who are motivated by external factors like family are able to channel this into their satisfaction toward their professional career because they enjoy working to support their family. For companies that need to meet the needs of these types of employees, they should consider how to focus programs or benefits on family, work/life balance, and flexibility in the workplace, while also providing opportunities for recognition and reward. Compared to Factor A, where the subjects were more intrinsically motivated, this may prove to be more manageable given that the company has control over these offerings. However, failing to meet these needs, especially with regard to family, could prove to have even more of a negative effect on the women, following Herzberg's theory that hygiene factors have the potential to cause greater dissatisfaction with one's job.

Factor C: Women driven by time management control. Factor C accounted for the smallest variance in the study, 22.2%, comprised of 4 of the 18 participants. This group had a mean birth year of 1977.5, similar to Factor B, and had the lowest average number of children (.75). This group had the greatest experience or length of time with the company

(mean of 5.375 years) and within the technology industry (mean of 10.875 years). Factor C also had the lowest mean job satisfaction rating of 3.75.

While this group was made up of the fewest participants, responses to the post-sort survey, factor array and anchor statement data reveal the recurring value of work/life balance. Participant 2 wrote, “Work life balance is key for me to be able to leave for family obligations without feeling guilty.” Participant 4 wrote, “Having work life balance makes all the other “stuff” work and keeps me motivated.” Participant 14, although not addressing work/life balance directly, wrote “The most important investment is my time.”

Time and work/life balance fall within Herzberg’s hygiene factor category, which could potentially negatively affect job satisfaction. It can be easy to lose control over time management and balance if the company does not provide support. Flexible work arrangements, onsite childcare, and shorter work days were all recommendations provided by Factor C to “a technology company with regard to the shaping of initiatives or programs that could better target women.” It is interesting to note that this group, which represents motivation by hygiene factors, also has the lowest job satisfaction rating as compared to the other factors, although still fairly high on the scale (between neither satisfied or dissatisfied and satisfied). Unlike Factor A, which embodies the “motivators” of knowledge and passion toward the work itself, and Factor B, which is motivated by a combination of motivators and hygiene factors by placing importance on external obligations, Factor C has the least amount of control over what they deem as important to motivating them: time management. Unless they can be proactive in time management, which is not always easy to do in a high stress, frequently changing technology environment, their satisfaction level suffers. This is further

seen in comments from Factor C participants who acknowledge their lower ratings in statements like “FY14 was a very challenging year. FY15 will be much better” (Participant 4).

Conclusions

The first research question was to determine the motivational factors for women who work in a high tech organization. Through an in-depth literature review, 75 different factors were identified and categorized into five umbrella categories based on the researcher’s perception of themes: tangible factors, external obligation factors, self-fulfillment factors, organizational and social factors, and work and task-specific factors.

The second research question was to identify what are the highest and lowest rated concourse items for each motivational group. Group One was identified as the “Driven by Intrinsic Values of Work” group. The highest-rated concourse items for this group are W12 (Job is intellectually challenging), S23 (Passion for Work), and S5 (Job Autonomy or Independence). The lowest-rated concourse items for this group are E5 (Children), E7 (Spouse’s Job Characteristics), and S17 (Internal Competition). Group Two was identified as the “Driven by External Obligations and Validation” group. The highest-rated concourse items for this group are S20 (Performance Recognition), E2 (Relationship with Family), and S15 (Work/Life Balance). The lowest-rated concourse items for this group are S4 (Prestige), O4 (Your Company's Involvement with the Community), and S16 (Comfort in Current Role). Group Three was identified as the “Driven by Time Management Control” group. The highest-rated concourse items for this group are S15 (Work/Life Balance), S1 (Personal

Growth), and W3 (Opportunities for Continuous Learning on the Job). The lowest-rated concourse items for this group are E7 (Spouse's Job Characteristics), O4 (Your Company's Involvement with the Community), S18 (External Competition), and S4 (Prestige).

The third research question was to examine if women who have worked at technology organizations for different periods of time share a similar view of motivation. The findings indicated that the women who have worked over ten years in the technology industry shared similar views, either falling into Group 1 or Group 3. Perhaps women who have obtained this much experience in the field are pursuing something that they are truly passionate about and are, therefore, "driven by the intrinsic value of their work." Or, perhaps, given their amount of experience and time in the workforce, they feel more confident in asserting control over their schedules and potential for work/life balance, hence the "driven by time management control" grouping. Follow up research is necessary to determine if the question tying length of time in the industry to shared motivational views is unique to the technology sector or if this is similar across other industries. Although this study does not focus on age, it would be worth exploring further how age affects views toward motivation given that women at certain ages may be considering starting families or may be re-entering the workplace after having children; otherwise a dive into age's impact on personal versus professional decisions.

The last research question was to examine if women who fall within different motivational groups have different job satisfaction levels. The findings indicated there was no difference in the mean job satisfaction ratings for Groups One and Two, both averaging a score of 4 or "Satisfied." Group Three scored only slightly lower with an average of 3.75.

Based on this data, there does not appear to be differences in job satisfaction ratings for the three motivational groups and all groups appear to be relatively satisfied.

Discussion

While the sample size for this study was only 18 women who represented a range of backgrounds, experiences and personal and professional situations, Q methodology provides an effective look at their attitudes toward what motivates them in their current role in a high tech organization. Through quantitative and qualitative data analysis, three factor loadings, or groupings, were established based on the participants' Q-sorts. After reviewing the factor arrays, anchor statements and qualitative survey data, the research outlined descriptive themes for each of these groupings: women driven by intrinsic values of work; women driven by external obligations and validation; and women driven by time management control. These are broad themes that may or may not apply to all women who work in high tech organizations, but they provide a good framework for companies considering methods for recruiting, retaining and developing their female employee population. Because companies are comprised of a female population that embodies all of these themes, it is important for them to attempt to meet each and every one of their primary motivational needs. They should focus on offering challenging and substantive work assignments, opportunities for recognition, and provide family-oriented benefits and work/life balance. These were the primary motivators for women who work in a high tech organization. While some of these are classified by Herzberg as "motivators" and others as "hygiene factors," it is evident from

the survey responses that women feel that they could potentially have a significant impact on their overall job satisfaction.

In reviewing the original research questions that this survey set out to answer, the researcher identified 1) motivational factors for women who work in a high tech organization, 2) for each motivational group, what were the highest and lowest rated concourse items, 3) were there shared views of motivation across the groups of women who have worked at technology organizations for different periods of time, and 4) differences in job satisfaction levels between women who fall within different motivational groups.

Limitations and Delimitations

Because of limitations in resources, the study includes participants from one high tech organization. There may be future opportunity to conduct similar research at other technology companies, but this particular study must be limited to a single source of female employees.

While much of the gender gap in technology discussion centers on women in actual technology-related positions, this study looks at women who work in a high tech organization, regardless of their role. There may or may not be consistencies in how female computer science professionals and engineers rate their motivational factors compared with women who work in the organization's Finance or Legal departments. The differences in career positions and roles within the organization should be considered for future research.

Additionally, future studies should also consider the implications and effect that various cultures have on motivational factors and job satisfaction for women who work in a

high tech organization. Many of the larger, high revenue generating technology companies have international offices. How does each country and its culture affect how women are motivated in this industry? Are women from certain regions more susceptible to Herzberg's extrinsic hygiene factors or motivational factors than in other geographies? Such research would take a great deal of time and resources, but the findings would provide an even more accurate understanding of the effect of motivational factors on women in a high tech company.

Significance of Study

Because there is little research to date on the subject of motivational factors for women in a high tech organization, this study provides an introductory base level finding. While there has been some research on motivational factors and women, generally, there has been a significant time lapse from when it was conducted to the current time. It is important that research regarding these correlations be conducted periodically given shifts in workplace norms, technology, organizational cultures, and attitudes and perceptions toward women's roles in a professional setting and in the home. As seen in the 2013 "Lean In" movement, a great deal has already changed in attitudes toward women in leadership positions and the support networks needed and associated with these roles: "The time is long overdue to encourage more women to dream the possible dream and encourage more men to support women in the workforce and in the home" (Sandberg, 2013, 11).

The fact that this research focuses specifically on the high tech industry is also relevant given the current gender gap and organization and industry wide initiatives to increase the number of women in Science, Technology, Engineering and Mathematics. This is a timely issues; one that could be further improved by a better understanding of what women who currently work in a high tech organization perceive as significant motivational factors. This study and future research on the subject may contribute to a better theoretical understanding of how motivational factors influence job satisfaction, as well as practical guidance that organizations can use to meet the needs of their current and future female employees. The practical interpretations may affect recruiting, retention programs, employee development, engagement and benefits offerings. In return, “happy employees are likely to be more motivated, engaged, committed, and loyal to their employers” (“Happiness Research,” 2007, p. 53).

While this study is unique to the high tech industry, future research is recommended to explore motivational factors for women in other industries, especially those that experience a noticeable difference in the employee gender breakdown and gender differences in leadership positions. It is also recommended that further research be conducted on this topic in areas outside of the United States. Researchers may also want to investigate the relationship of motivational factors with variables other than job satisfaction, such as employment tenure, family composition, or educational level. Are women who are the sole breadwinners for their family motivated by different factors than women who have a second source of income? Do the sole breadwinners with families experience different levels of job satisfaction because they are not just providing for themselves? Are women who are dual-

contributors to their household income able to pursue careers that they feel more passionate about? How do all of these scenarios compare to single women with no family members to support? Does being able to pursue personal career interests result in higher job satisfaction? The potential research questions concerning women in the workplace and motivational factors for women in the workplace are endless. This particular study was intended to focus on a small and specific population, but could serve as an introduction and model to other scholars who see the benefit of expanding knowledge and recognition of this topic as it affects organizations in any industry across the globe.

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APPENDICES

Appendix A

Participant Solicitation Email

Greetings Raleigh WLC members!

For those of you who don't know me, probably the majority of you, my name is Kathryn Fish and I've been working in Red Hat's Legal Department for nearly 2.5 years. During this time I have also been working toward my Master's degree in Human Resources Development at NC State and the end is finally in sight! For the final leg, I will be conducting and analyzing unique research for my thesis, which will be presented to a faculty committee this Spring. The WLC's discussions on women in the workplace have served as the inspiration for my research and I've ultimately decided to focus on exploring motivational factors for women who work in high tech organizations. With this topic, and what I believe to be an engaged and talented resource pool, I'm hoping to receive input and perspectives from many of you as research participants. I've included a brief overview of my topic and research methods below (please note, the survey would take about 30 to 45 minutes and participation is NOT limited to those in IT or engineering-related roles). If you're interested in participating or have any questions, please send me an email by Friday, February 21. I look forward to hearing from you!

- Kathryn Fish

Background

Recently, there has been a great deal of discussion on the gender divide issue in technology. We see these conversations taking place within this WLC forum, the broader technology community, and social media. I am interested in what various factors motivate you, as female employees at Red Hat, with regard to your professional career and how these factors may affect your overall job satisfaction. For this reason, I am contacting you to request your participation in a research study constructed to define the most common motivational factors for women who work in a high tech organization.

The results of this study will contribute to the body of knowledge used in helping technology companies recruit, retain and develop their female employees by tailoring initiatives and programs to meet women's motivational needs.

Methods

I will be gathering data using a q-methodological approach, which requires participants to group, then rank their agreement with various statements (in this case, statements about motivational factors). Participants will also be asked to complete a survey that includes basic profile information and a brief job satisfaction questionnaire. All participants will be required to complete an Informed Consent Form prior to taking part in the study and all

data/survey responses will be anonymous. The estimated time for participation is 30 to 45 minutes. All surveys will be administered onsite at Red Hat Tower.

Interested in Participating?

If you're interested in taking part in this study, please contact me via email by **Friday, February 21**. Based on availability, I will set up a timeblock in early March for participants to drop by a conference room, receive instructions and complete both parts of the surveys.

Appendix B

Post Card-Sort Questionnaire

1. Please identify the card that you assigned under +6 and your explanation for placing it in this position.

Card #: _____

Explanation:

2. Please identify the card that you assigned under -6 and your explanation for placing it in this position.

Card #: _____

Explanation:

3. What specific statements were the most difficult to place? Provide two examples and explain your thoughts.

Card #: _____

Card #: _____

Explanation(s):

4. In your opinion, what factors influenced or shaped the way in which you sorted the cards? Please provide any information that you feel is relevant to the study.

Appendix C

Subject Demographics

1. Year of Birth: _____

2. Office Location: _____

3. Department or Functional Area: _____
(Examples: IT, Engineering, Finance, Operations, Business Units, Legal, Human Resources, Marketing)

4. Length of time with Company: _____

5. Length of time working in the technology sector: _____

6. What other industries have you worked in? _____

7. Do you currently hold a leadership role at the Company? (Yes/No): _____

If “Yes,” in what capacity?

(Examples: managerial role, project management role, committee chair)

8. Post-high school education (please list all applicable degrees or certifications):

9. Marital Status: _____

10. Children (Yes/No): _____

If “Yes,” number of children: _____

11. Are you the primary source of income for your household? _____

Appendix D

(Job Satisfaction Measurement Instrument: Minnesota Satisfaction Questionnaire “MSQ”-20-item short form)

Please indicate your satisfaction or dissatisfaction for the following items based on a scale of 1 (very dissatisfied) to 5 (very satisfied).

	Very dissatisfied	Dissatisfied	Neither satisfied or dissatisfied	Satisfied	Very satisfied
Being able to keep busy all the time	1	2	3	4	5
The chance to work alone on the job	1	2	3	4	5
The chance to do different things from time to time	1	2	3	4	5
The chance to be “somebody” in the community	1	2	3	4	5
The way my boss handles his/her workers	1	2	3	4	5
The competence of my supervisor in making decisions	1	2	3	4	5
Being able to do things that don’t go against my conscience	1	2	3	4	5
The way my job provides for steady	1	2	3	4	5

employment					
The chance to do things for other people	1	2	3	4	5
The chance to tell people what to do	1	2	3	4	5
The chance to do something that makes use of my abilities	1	2	3	4	5
The way company policies are put into practice	1	2	3	4	5
My pay and the amount of work I do	1	2	3	4	5
The chances for advancement on this job	1	2	3	4	5
The freedom to use my own judgment	1	2	3	4	5
The chance to try my own methods of doing the job	1	2	3	4	5
The working conditions	1	2	3	4	5
The way my co-workers get along with each other	1	2	3	4	5
The praise I get for doing a good	1	2	3	4	5

job					
The feeling of accomplishment I get from the job	1	2	3	4	5
Indicate the extent to which you are satisfied with your current job.	1	2	3	4	5

Provide any comments or feedback you have on your current job satisfaction level. Were there instances in your previous professional career(s) where you experienced higher or lower levels? Why?

Appendix E

Initial List of Concourse Items and Grouping of Motivational Factors

Tangible Factors	External Obligation Factors	Self-Fulfillment Factors	Organizational and Social Factors	Work and Task-Specific Factors
Total Benefits Package	Family Obligations (Sense of duty, commitment)	Comfort in Current Role	Organizational Brand or Image	Changing World of Work (External factors including technology, work environment, globalization, virtualization)
Job Security	Relationship with Family	Personal Achievement	Relationship with Colleagues	Behavioral Consequences Stemming from Work or Supervisor (Positive or negative reinforcement)
Perks (Flex hours, working from home, tuition reimbursement, gym discount)	Children	Prestige	Company Policy Communication	Regularity of Work (Consistent workflow, predictable and manageable busy cycles)
Insurance (Health, dental, life)	Job Effect on Family	Flexibility in How Work Gets Done	Being Helped by Supervisor	Simplicity in Work Tasks
Work Hours Per Week	Other Personal Life Factors	Self-Actualization (Ability to realize your full potential; ex. through expressing creativity, pursuit of knowledge, desire to give back to society)	Social Identity or Sense of Belonging to a Group	Redundancy (Performing the same tasks over and over again)

Total Compensation	Job Security for Family	Job or Career Status	Workplace Conditions (Seating, comfort, safety, etc.)	Job is intellectually challenging (Opportunities to problem solve)
Opportunity for Promotion or Career Advancement	Spouse's Job Characteristics (Salary, hours, etc.)	Performance Recognition	Your Company's Involvement with the Community (Charitable contributions, volunteer opportunities,)	Working to Solve Bigger Problems
Material or Financial Reward		Stimulation by Work	Working in Groups	Challenging Nature of Work
Bonuses (Annual, quarterly, etc.)		Work's Contribution to Positive Self-Image	Current Level of Supervision by Manager	Job Involvement (Engagement and enthusiasm)
Pay Satisfaction		Job Autonomy or Independence	Supervisor Feedback	Opportunities for Continuous Learning on the Job
		Personal Growth	Office Location	Variety of Work
		Passion for Work		Stress (Environment or work itself)
		Overcoming Anxiety		Intrinsic Task Value
		Internal Competition		Opportunities for Continuous Learning from Colleagues
		Lack of Other Career Prospects		Job Characteristics (Specific job function, daily responsibilities)
		Dissatisfaction at Previous Job(s)		Clarity in Job Role and Responsibility
		Feeling of Duty (To Yourself, Family, Society)		Opportunity to Teach Others

		External Competition		Necessary Equipment is Available to Help You Perform Your Job Effectively
		Feeling of Power in Current Role (Over self or others)		Ease of Work/Comfort in Role
		Personal Control (Over your career path)		Skill Mastery
		Fear of Unemployment		Visibility within the Workplace
		Your Work's Contribution to Society		
		Work's Alignment with Personal Goals		
		Work's Alignment with Personal Beliefs and Values		
		Leadership Opportunities		
		Work/Life Balance		

Appendix G

Informed Consent Letter for Research Participants

North Carolina State University INFORMED CONSENT FORM for RESEARCH

Title of Study: Women in the Workplace: Exploring the Effect of Motivational Factors on Job Satisfaction for Women Working in a High Tech Organization

Principal Investigator: Kathryn Fish

Faculty Sponsor: Dr. James Bartlett

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

There are significantly higher numbers of men who work in the high tech industry as compared to women. However, existing research shows that women have a positive impact on a company's financial performance and the organizational culture. Given a projection that 1.4 million computing-related jobs will open up in the United States by 2020, it is important that technology companies learn to recruit and retain female employees who have such an effect on the workplace and the company's bottom line. This research aims to explore how women who do work in a high tech organization view and rank motivational factors as they apply to their professional career. Through a Q-methodological approach, the motivational factors will be grouped into themes to illustrate areas of importance. The research will also seek to identify the effect of these motivational factors on the job satisfaction levels of the female employees. From this, companies can help tailor policies, programs, job structure and culture to better meet the needs of the female workforce. This, in turn, will ideally result in happy and satisfied female employees.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to spend 45 minutes to 1.5 hours completing an activity involving sorting cards with statements on them based on your level of agreement with the statement. You will also be asked to complete a Post-Card Sort Questionnaire that contains basic participant profile information. Depending on your preference, both segments of this study can be completed in an online environment at your leisure or in a face-to-face session facilitated by the researcher.

Risks

Given that research subjects are being asked to identify and rank motivational factors as they apply to their current role, there may be a concern that what information they give could affect their job security or employment status. To mitigate this risk, please note that all of the subjects in this research study will remain anonymous and unidentifiable. This research is intended to provide the organization with data that can help them further meet the needs of their female employee population.

Benefits

There is no direct benefit to the subject for participating in the study. However, the purpose of this study is to provide the Company (and others like it) with a better understanding of their female employee population so that they can positively affect the work environment, benefits, job structure with the intended result of increasing employee job satisfaction.

Confidentiality

The information in the study records will be kept confidential to the full extent allowed by law. Data will be stored securely on a private network server under password protection. No reference will be made in oral or written reports which could link you to the study. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide.

Compensation

You will not receive anything for participating in this study.

Does this Affect My Current Employment Status?

Participation in this study is not a requirement of your employment at Red Hat, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Kathryn Fish, at 100 East Davie Street, Raleigh, NC 27601 (19th floor), or (919) 754-4626.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

Subject's signature _____ **Date** _____

Investigator's signature _____ **Date** _____

Appendix H

Approval Letter from Institutional Review Board of North Carolina State University

North Carolina State University is a land-grant university and a constituent institution of the University of North Carolina

Office of Research and Innovation
Division of Research Administration

NC STATE UNIVERSITY

Campus Box 7514
Raleigh, North Carolina 27695-7514

919.515.8754 (phone)
919.515.7721 (fax)

From: Jennifer Ofstein, IRB Coordinator
North Carolina State University
Institutional Review Board

Date: February 4, 2014

Title: Women in the Workplace: Exploring the Effect of Motivational Factors on Job Satisfaction for Women Working in a High Tech Organization

IRB#: 3739

Dear Kathryn Fish,

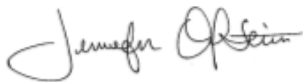
The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101. b.2). Provided that the only participation of the subjects is as described in the proposal narrative, this project is exempt from further review. This approval does not expire, but any changes must be approved by the IRB prior to implementation.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.
2. Any changes to the research must be submitted and approved by the IRB prior to implementation.
3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Please forward a copy of this letter to your faculty sponsor, if applicable.
Thank you.

Sincerely,



Jennifer Ofstein
NC State IRB