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Abstract

It is well recognized that organizations play a central role in generating inequality in employment outcomes between women and men. Women are often disadvantaged relative to men when they enter firms either because they are more likely to enter into lower paying positions or into roles that offer less advancement opportunities. What is less well-understood are the mechanisms though which women may be able to overcome these disadvantages. One theoretical solution to this problem is for women to undertake less typical career paths within the firm and move to more fecund jobs and job ladders that offer more opportunity for advancement. However, there is a risk to moving atypically, as erratic careers are often viewed negatively. We investigate this question with monthly observations of 53,311 exempt U.S. employees at a West Coast Fortune 500 tech company over an eight year period, from 2008 to 2015. We first demonstrate that jobs disproportionately staffed by women are, on average, of lower pay and lower advancement opportunities within the firm. We find, erratic career mobility, defined as a sequence of atypical job moves, results in differential outcomes for women and men. Specifically, women who move erratically are promoted faster than similarly erratic men. However, this effect is the opposite for performance appraisals. More erratic mobility by women results in lower performance appraisals than similarly erratic men. Mobility is therefore a double-edged sword for women - we refer to this as the dilemma of mobility.

It is well recognized that organizations play a central role in generating inequality in employment outcomes between women and men (Baron, 1984). In particular, large organizations exert considerable influence on these outcomes because they provide jobs for approximately 45% of the US workforce and also pay salaries that are approximately 50% higher than small businesses (Haltiwanger et al., 2012). Unfortunately, upon entering these types of organizations, women are often disadvantaged relative to men in both pay as well as opportunities for advancement. First, there is often a within-job pay difference between women and men who perform the same jobs within firms (Marini and Fan, 1997; Cohen and Huffman, 2003), even though this form of discrimination is relatively easier to identify than other forms of bias and has been illegal since 1963 (Petersen and Saporta, 2004). Second, there is also a greater likelihood for women in these large organizations to enter into lower paying positions or reside on internal career ladders that offer lower opportunities for advancement than men (Bielby and Baron, 1984). For example, Petersen and Morgan (1995) examined the significance of this form of segregation for 705 blue-collar and clerical occupations and 10 administrative and professional occupations. They found that among blue-collar and clerical jobs, occupational segregation by gender can account for up to 40% of the existing wage differential between women and men (see England, 1984, 1994 for reviews).

Despite the prevalence of evidence highlighting this inequality, little theoretical investigation has concerned itself with potential mechanisms through which women may be able to overcome these obstacles. Knowledge of how women may or may not be successful in their intra-firm mobility efforts is valuable for substantive reasons beyond pure theory. For example, if the likelihood of hiring more women into a firm is dependent on the ratio of women versus men at different levels of the firm (Cohen and Huffman, 2007), then understanding how women and men move into the different levels has far-reaching implications.

One perspective intra-firm mobility theorists take is to view internal labor markets as orderly career ladders within firms that employees move through on a regular basis (Doeringer and Pirore, 1971; Althauser and Kalleberg, 1981). However, more modern investigations of organizations suggest the

persistence of internal career ladders vary among organizations (Pheffer and Cohen, 1984), and that employee mobility can diverge from these established paths in notable ways (DiPrete, 1987). Under this perspective, initial postings into a position and subsequent internal mobility may be more malleable and less well-defined than previously noted. In this case, movement between job roles that result in securing "better" positions within a firm is a theoretically possible solution for women. The evidence that women can succeed as executives in finance through potentially non-traditional career paths (Blair-Loy, 1999) leads us to speculate that women, who begin at less advantageous roles within a firm, could move internally and eventually secure similarly fecund positions as men, referred to as "strategic moves" by Spilerman and Peterson (1999: 225). Job changes are of particular importance to investigate because movement between jobs is assumed to provide significant increases in rewards relative to staying within a job (Sorenson and Tuma, 1981).

However, career sequence theorists would caution that too much movement in one's career may be disadvantageous and make employees seem erratic (Spilerman, 1977; Leung, 2014). This may be because managers hold expectations to follow a well-identified internal labor market path (ILMs) (Kerckhoff, 1995) or because erratic movement, apart from promotions, may be considered a signal for poor organizational commitment (c.f. Grusky, 1966). Hence the dilemma: while women likely require more erratic or less conventional internal mobility to be successful within a large company, these mobility behaviors are not likely to be so well received.

In this paper, we ask: do women benefit more than men from atypical intra-firm mobility in their careers? We examine how women and men may receive differential advantages as they construct more or less orderly internal career paths to improve their standing within an organization.   The topic of differential advancement by women and men in organizations has received notable attention, yet this specific possibility of strategic movement has not been as well addressed. Indeed, a set of work identifies the "bottlenecks" in advancement women face (DiPrete and Soule, 1988; Spilerman and Petersen, 1999), but does not take into account how a sequence of job shifts for women and men within these firms may

account for advancement and differential benefits. Other investigations take the perspective of mobility (both inter- and intra-firm) events as the outcome (Felmlee, 1982; Rosenfeld, 1980), but similarly cannot speak to how women may attain improved rewards within a particular firm. Finally, the study by Blair-Loy (1999) examined the complete job histories of successful women executives in finance, but is narrowly circumscribed by selecting on only successful women in finance.

We investigate the effects of internal mobility on career outcomes for all 53,311 Non-Exempt[1] U.S. employees of a Fortune 500 high technology firm based on the West Coast (hereafter TechCo), between 2008 and 2015. TechCo is particularly notable as a research site for several reasons. First, an in-depth investigation into a high tech company and the outcomes for men and women is particularly timely given the realization of the challenges women face in STEM-based fields. Second, the firm itself has publically declared the hiring and promotion of women and under-represented minorities as a priority and has also pledged to invest hundreds of millions of dollars to develop the pipeline of talent necessary to fulfill this goal. Investigation into the possible pathways for women attainment are particularly timely in this setting.

Women and Mobility

The topic of differential advancement by women and men in organizations has received notable attention. Previous examinations of the outcome of intrafirm mobility for women versus men generally find that there are "bottlenecks" to female advancement. For example, DiPrete and Soule (1988) show that there is a notable disadvantage in advancement for women near the boundary between the lower and upper-tier grades, while there are no differences between genders conditional on a women achieving a higher grade position. Spilerman and Petersen (1999) actually find a female advantage in the higher grade jobs, while finding similar female disadvantage in advancement beyond the lower and middle ranks. While these

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[1] These exclude hourly workers and unionize manufacturing employees. It includes engineers and management and administrative positions.

investigations examine position to position moves of female and male employees and demonstrate the differential positional advantages and disadvantages women and men face, they do not take into account how a sequence of job shifts of women and men within these firms may account for increasing advancement.

Other investigations take the perspective of mobility events as the outcome. For example, in Felmlee's (1982) investigation of both intra- and inter-organizational mobility processes for women, she examines the difference in how women choose to make within versus between employer job changes and shows that internal mobility is a function of age and duration while between-employer moves are a function of job rewards. Rosenfeld (1980) also examined the differences in career trajectories between women and men, demonstrating that white male career trajectories are steeper and extend for a longer duration than white females and all non-white labor market participants. While demonstrating that men and women do embark on different career paths, these studies cannot speak to how women may attain improved rewards within a firm as a function of their sequence of job shifts.

A more recent study by Blair-Loy (1999) examined the complete job histories of successful women executives in finance and reports more encouraging results. Despite a belief by the popular press and the women executives themselves that their advancement was along idiosyncratic career paths, she finds that successful women finance executives had careers that followed one of four recognizable patterns. This study usefully demonstrates how female careers may be identified as contributing to their success, yet it narrowly examines successful female finance executives, thereby limiting the scope of the findings.

Notably, Petersen and Saporta (2004) find that the gap in pay between women and men shrinks with seniority and that women are promoted at a higher rate at higher levels in the organization they examined. Similarly, DiPrete and Soule (1988) find that gender opportunities vary considerably within a firm, with differential advantages accruing to women depending on where they resided in the job

hierarchy. These findings suggest that there may be potential avenues for women to take within a firm to ameliorate their starting disadvantages.

Intra-firm Mobility

We begin by defining an employee's intra-firm career as comprising the sequence of job changes that an individual has held within a firm (Spilerman, 1977; Rosenfeld, 1992). Internal mobility, in this case, is movement between jobs in a firm. These jobs are situated within a firm's boundary and has been referred to as an Internal Labor Market (ILM) (Doeringer and Piore, 1971; Althauser, 1989). Earlier conceptions of ILMs portray jobs as being arranged in orderly career ladders, with assumptions regarding how skills from one position prepare individuals for their next job as a "line of progression" (Doeringer and Piore, 1971: 58). This perspective usefully informed studies that examined employees in highly bureaucratic organizations, such as government workers (DiPrete and Soule, 1988) or rank advancement in universities (Clark, 1987 [in Rosenfeld, p.45]). More recent investigations of this concept have identified how jobs may generally reside in identifiable "clusters," which group similar jobs yet still represent a demarcation of certain types of jobs (such as clerical) from others within a firm (such as technical ones) (Baron et al., 1988).

Because rewards granted to individuals are tied to the positions they hold, employers are restricted in how much they can adjust an individual's wage within a particular job. Therefore, individual gains are believed to accrue to those that move between jobs, as opposed to remaining within a given job (Sorensen and Tuma, 1981; Tuma, 1985). Because jobs are often conceived of as being sequentially related to one another in nature, perhaps because the skills needed in one are built on by the next (Doeringer and Piore, 1971), movement from one position on a job ladder, or more generally in a job cluster, to another is the most likely and typical path employees take to additional rewards. Most studies,

for example, find that employees advance along these generally recognizable paths (Althauser, 1989; Spilerman and Petersen, 1999; DiPrete and Soule, 1989).

However, career ladders are limited in the range of salaries associated with them and they differ in the returns accrued to them. Women and men differ in the types of career ladders they enter into an organization (Bielby and Baron, 1984; Baron et al. 1986), with women entering and residing on career ladders that offer much less advancement and are located in lower tiers with regard to rewards than those that men enter on. For example, Petersen and Saporta (2004) find that women were disproportionately likely to enter career ladders that begin at lower pay tiers, end in lower pay tiers, and also on career ladders with only one job attached to them. This suggests that women who remain on the career ladder they enter the firm on are less likely to be able to advance as far as men, on average. Therefore, the pervasive finding is that despite the fact that women are, in some situations, as likely to be hired as men into organizations (Barbulescu and Bidwell, 2012; Fernandez and Weinberg, 1997; Petersen et al., 2000), they still face disadvantages in opportunities for advancement in promotion and pay.

This realization notwithstanding, a possible viable path forward in light of these results could be for women to proceed along a non-traditional intra-firm career sequence and move to more rewarding jobs within their organization. To the extent that women, on average, begin on career ladders that offer lower opportunities for advancement or are lower paying, then they necessarily need to embark on less traditional or more erratic career paths to reach positions that offer similar opportunities as those for men. This is because men, who, on average, already reside on paths that offer more opportunities need only to remain on these paths and follow more traditional ladders. This idea is what Spilerman and Petersen (1999: 225) referred to as "strategic moves," which may "offer the prospect of unusual opportunity but can carry a risk because of the break in established obligations and expectations between employee and supervisor." This is reasonable in light of the fact that scholars recognize how intra-firm careers may not always be best represented by systematic career advancement up a single ladder (DiPrete and Krecker,

8

1991) or even follow any particularly recognizable pattern or advancement (Wilensky, 1961; Rosenbaum, 1976; Blair-Loy, 1999).

Erratic Job Histories

We proceed with the perspective that career mobility in modern organizations may not represent clear hierarchical trajectories on rigid internal career ladders, but instead be better represented by the sequence of job roles that an individual accumulates over time (Spilerman, 1977). This departs from the perspective that scholars who apply sequence analysis take in examining sequential careers in a theoretically substantive way. A sequence analysis perspective presupposes that there are prototypical career sequences that individuals follow or diverge from. This necessitates an assumption that these "typical" sequences may be identified a priori. Our interviews with informants at TechCo suggest this is not the case. While certain Human Resource individuals may hold job ladder promotion schedules, the existence of a recognized and well-identified career ladder is unknown to both employees of the firm and to the authors as researchers.

We therefore conceptualize individual jobs in a firm as points in space. Intrafirm job mobility is the movement of employees across these points, as they work in different positions in the firm. Employees therefore accumulate a job history by effectively moving among these points. Note that the jobs within a firm will vary in how similar or different they are from one another. We follow Leung's (2014) conception that the "distance" between these job titles represents the recognition that two jobs are more or less sequentially attached to one another. For example, in the most rigid job ladder hierarchies where all employees can only proceed from Job A to Job B, then the link or distance between these two points will be extremely strong. The transition from Job A and Job B, in this rendering, would be a very familiar one and the 'distance' between these two points would be very small. On the other hand, if employees rarely move between Job A and Job C, then distance between these two points would be greater. Under this conceptualization, the greater distance that an individual's job history accumulates, the

less familiar or more atypical a path the individual has traversed. Mobility can therefore vary between individuals in the distance between sequential jobs accumulated over time (Leung, 2014). See Figure 1 for a graphic conceptualization.

[Insert Figure 1 about here]

Points A, B, C, D, E, F are jobs within a firm. They vary in distance from one another according to how familiar or common the transitions between them are. Employee 1, by moving between Jobs A, B, E, and F has accumulated a job path of a lower distance than Employee 2, who has moved between A, E, C, and F. Individual employees therefore craft their intra-firm career histories by moving between jobs within a firm. To the extent that there are more versus less common paths within the firm, this would be revealed by the more common versus less common moves between individual job positions within the firm, as measured by the distance between the moves. With this in mind, we turn to the setting to investigate how more versus less erratic movement within the firm may differentially benefit women and men.

Setting and Data

We investigate the internal job mobility for women and men in TechCo between the years 2008 and 2015. The personnel data we received is large and granular, comprising 4,270,115 monthly observations for 68,438 employees. Although TechCo was founded in the late 1960s, the data we have starts in January, 2008 and therefore represents a more recent snapshot of the company. It is comprised of individuals who were at TechCo prior to the beginning of the observation period and also those who joined during the window. In 2008 there were 46,147 employees, and since then has ranged from 42,787 employees to 50,547 employees annually.

We concern ourselves with the population of workers who are exempt for at least a portion of their career (for what constitutes an exempt worker, please refer to the Federal Fair Labor Standards Act) for which we have standard pay grade data, which will be described in more detail in a later section. Exempt workers are traditionally salaried workers – those in more traditional 'white collar' jobs – such as engineering, management, and administrative positions. This results in a condensed data set of 3,246,031 monthly observations for 53,311 employees.

The data set contain several forms of detailed data for each employee. First, the data set contains demographic characteristics. There are indicators for the gender, ethnicity, and age group of each employee as well as their college major and highest degree status. Second, the data set contains geographic details, starting from the level of the country down to the level of the city of one's local office. Third, the data set contains organizational tenure attributes, including the time the employee has been at TechCo as a whole, the time the employee has been in his or her particular job function, the time the employee has been in his or her organizational unit, and the time the employee has been in his or her pay grade. Fourth, the data set contains job characteristic data, including different levels of categorization of an employee's job, nine levels of organizational structure, the employee's supervisor, whether or not the employee is himself or herself a supervisor, and the type of worker an employee is. Fifth, there is limited entry and exit data, including data on acquirements and mergers, and whether an exit was voluntary, involuntary, desired, undesired, etc. Finally, there is performance data, including pay grades and pay grade groups, as well as performance ratings and stock share levels. We explain in detail below how these data are operationalized.

This setting is particularly well suited to studying the concepts of mobility and differential gender effects as TechCo itself has been particularly interested in promoting diversity in the workplace, going so far as to state that "diversity and inclusion are among the most important forces driving [their] evolution and reinvention" (TechCo Annual Report 2015). One of the key areas they have focused on is increasing the representation of and ensuring equal pay for women in their workforce. In line with this goal, we

11

utilize the granular data we have to present a historical and holistic picture of gender diversity and parity over the course of these past eight years, with a special attention to mobility and longitudinal career effects, as those are difficult to examine in annual reports.

We begin with an analytical description of entry and mobility into TechCo. First, it is important that we clearly define what we consider an entry into the organization into our data set. Since our data set begins in 2008, for that year there is a mix of employees who had already been employed at TechCo and were just beginning to be tracked, and those who joined the company. We utilize the field called Length of Service to determine the difference; however, for a number of potential reasons, the Length of Service field is not always close to 0 when an employee starts at the company. For example, for those employees whose first observation is in the years 2009-2015, and thus joined the company in that period (or the employee would have been seen in 2008), the median starting Length of Service ranges from .74 to 1.15. Therefore, to determine which employees whose first observation is in the year 2008 actually started in 2008, we use a starting Length of Service threshold determined by the distribution of job tenure. First, we calculate all the durations of employees in the same job before moving to a new one, then we use the 1% percentile of that distribution to determine our threshold. The argument would be that for any starting Length of Service below that threshold, it is quite likely that that employee has recently started or at least still has starting "characteristics." We use this method to derive a new population of employees who started their careers at TechCo during the observation period of approximately 20,152 employees. We use this population to present a cleaner and more appropriate view of how employees start their careers at TechCo, and where they go from there.

Of the 340 job titles that each employee starts in, they are nested in one of 75 coarse job families. These job families are further nested within seven functions. We begin our examination by looking at the 75 coarse job families that employees start in because they represent a level of detail that is usefully distinctive, yet not too unwieldy to analyze. The most popular coarse job families are the engineering fields of Hardware Logic Design, Software Development, and Manufacturing Development. If we

examine entry rates more in detail, we find that not only are the top four entry course job families the same for males and females, but also the entry ratios by gender are similar as well (Table 1). After the fourth category, however, the top entry coarse job families start diverging, such that the fifth most popular entry category by proportion of males becomes the seventh most so for females. Therefore, we see slight descriptive evidence of a gender sorting by coarse job family.

[Insert Table 1 about here]

This gender sorting becomes more pronounced, however, when we consider the pure male to female ratio by coarse job family. For those coarse job families with at least 10 individuals entering, we see that three of the top five male dominated categories are in engineering (two are in engineering management), while four of the five top female dominated categories are in human resources (Tables 2 and 3). The general trend is that the engineering fields tend to be more male dominated, while the marketing, human resources, finance, and general fields tend to be more female dominated.

Employees are each assigned a Pay Grade, which represents a range of actual salaries. Pay Grades range from 2 to 20, with an approximately linear relationship among them. Pay Grade 2 being the lowest paid salaried employees, up to 20 being the highest. We averaged all the pay grades of employees in each of the coarse job families to arrive at an average pay grade for each coarse job family. We find a .394 correlation between male to female ratio and starting mean pay grade by coarse job family. Specifically, that the mean starting pay grade for jobs that are dominated by women are, on average, lower than the ones for predominantly male positions. The starting mean pay grades for the 10 jobs mentioned earlier display a similar pattern (Figures 2 and 3). This suggests evidence of sex segregation in the types of jobs women and men start in, with women sorting into jobs that are, on average, lower paying.

[Insert Table 2 about here] [Insert Table 3 about here]

[Insert Figure 2 about here]

We further examined if there was evidence of women and men being paid differentially, within jobs. We examine pay grade disparities for individual employees over this observation period by running a simple OLS regression on starting pay grade by gender, we find a significant difference of women being paid less than men, even after controlling for common confounds (Table 4). In addition to adding a flag for whether the pay grade was originally standardized, or transformed to be standardized, we control for, respectively, historical time effects, or the year of entry; demographics, such as age group, ethnicity, college major and highest degree earned; job characteristics, such as the location of work, job title, organizational position, hierarchical position, manager status, specific supervisor, shift type, tenure in the organization, tenure in the organizational unit, tenure in the job, exempt status, and acquirement status; and exit type, which is the realized exit status of the employee (e.g. neutral departure, voluntary departure, etc.), and is used as a proxy for unobserved characteristics, and the first broad performance rating, if applicable. Despite these stringent controls, women are paid less than men for the same job, holding constant all observable differences.

[Insert Table 4 about here]

Regardless of where employees start, though, there is ample opportunity for movement once within the company. Informants at TechCo have told us that movement is, "encouraged" and that a common belief within the firm is that "changing jobs is the only way to get ahead in the firm." To ease this process, TechCo has an internal job interface, in which descriptions for open jobs are posted and current employees can apply. Mobility is generally encouraged, and to this effect 27,339 of the 53,311 (51.3%) employees have at least one job title change throughout their career at TechCo. If we examine the breakdown by gender, we see a slight difference in that women are more likely to make job title changes throughout their career. Specifically, since the data set is disproportionately balanced (it is approximately 24.4% women), we calculate the proportion of males and of females by number of job title changes, and find that the proportion for women is slightly more right skewed (Figure 3).

14

[Insert Figure 3 about here]

Given the encouragement of movement in the company, it is reasonable for there to be more and less well-defined internal ladders; and, while it is generally believed that employees need to make a move to advance, this is not a certainty. Returning to our population of employees who start their careers at TechCo over the observation period, we find that a large number start in one of three job titles – Component Design Engineer, Software Engineer, or Process Engineer. The number of starting employees is 2,591, 2,573, and 1,249, respectively, together accounting for approximately 31.8% of starting employees. However, the job titles that these employees move to after these initial ones are diverse and broad. As an example, for employees who start as Component Design Engineers, the most popular second job titles are Silicon Architecture Engineer, SoC Design Engineer, and Pre-Si Valid/Verif Engineer. There are a total of 53 second job titles, and the distribution of moves into the top 10 can be found in Figure 4. Note, however, that the mean pay grade difference is not necessarily the highest for the most common next job title (Figure 5), indicating that while there are job title changes that might represent more popular progressions, it is not clear whether there is a strict pay progression, and there are a number of alternative paths to choose from.

[Insert Figure 4 about here]

[Insert Figure 5 about here]

Methods

We operationalize erraticism in such a way as to capture the intricacies of these kinds of career paths. A common way to measure the typical career path and deviations from it is to use sequence analysis (Blair-Loy 1999), but we find such an operationalization inappropriate for our theoretical conceptualization here for a number of reasons. First, the sheer number of states we consider is not amenable to sequence analysis. Since the idea behind sequence analysis for careers in general is to cluster movement between states, it becomes more difficult and less meaningful when the number of states grows large; the number

of distinct job titles in our data set is 363. Second, related but distinct to the number of states, selecting the number of meaningful paths, or clusters, is a subjective decision. Although there are more analytical and data-guided ways to derive cleaner paths, the determination of the number of distinct paths in our setting would be difficult. If we select too few clusters, the defined paths might be too broad and uninformative, and the smaller, unique paths, which we may be particularly interested in, may be grouped together. If we select too many clusters, the more prototypical paths may not be weighted correctly, and rarer paths might be seen as equally as possible or likely as these prototypical paths. Third, career sequence analysis requires a realized sequence of states. This makes it more difficult to assess effects throughout one's entire career, as one might be clustered differently after x months of observation versus y months of observation.

To investigate the differential effects of mobility patterns by gender we instead operationalize erraticism as a result of realized transitions. Specifically, we collect all the transitions from one job to a different job in our data set and use those occurrences to construct a transition probability matrix. We use probabilities to normalize across the starting jobs so that the total probability of transitioning to any other job sums to 1. As a simple example, we construct the transition probabilities for the starting job of "Chemical Engineer." For "Chemical Engineer," there are only nine instances of job title changes in our data set, one to "Materials TD Engineer," one to "Facilities Engineer," one to "Process Engineer," two to "Quality Reliability R&D Engineer," and four to "Construction Project Manager." Since there are only five distinct job title changes, the transition matrix entry for "Chemical Engineer," would show .44 for "Construction Project Manager," .22 to "Quality Reliability R&D Engineer," and .11 to the other three job titles. Then, the erraticism is found by taking the inverse, and an employee's total erraticism would be found by averaging the erraticism of that employee's individual moves through his or her career at TechCo. Under this formulation, employees who have never changed job titles have an erraticism of 0, those who changed job titles closer to more probabilistic paths (e.g. those that other employees also take)

16

have medium levels of erraticism, and those who changed job titles closer to less probabilistic paths (e.g. they are perhaps the only realizations of those job title changes) would have the highest erraticism.

Whenever there is a job title change in our data set, there is a corresponding erraticism value; the distribution of our erraticism measure (those employees that do not move have a value of 0, and are removed) is shown in Figure 6. It is left skewed, such that if a job title change is made, it tends to be more erratic than not. Furthermore, in Figure 7 we can see proportional erraticism distributions by gender – there does not appear to be a striking difference between males and females. As an example of a career that is more erratic (erraticism~.918), the career path is Technical Mkt Engineer to Platform Architect to Platform Manager to Field Applications Engineer to Field Sales Engineer. As an example of a career that is less erratic (erraticism~.578), the career path is Accountant to Financial Analyst to Finance Specialist to Fin Business TechCo Specialist to Snr Finance Business Analyst.

[Insert Figure 6 about here]

[Insert Figure 7 about here]

We then use this measure of erraticism to explore how mobility affects two indicators of success with a firm: pay and performance. Pay outcomes are an unambiguously important indicator of success within a firm and evidence of pay differentials are substantively of interest. Furthermore, we understand that many large corporations benchmark pay with one another, and so findings with respect to pay are inherently generalizable. Performance, although less straightforward, is also an important indicator of success, and the outcomes of performance appraisals are recognized to influence both pay and promotion opportunities, despite potentially unfair effects (Castilla, 2008).

We use pay grades between 2 to 20. As they are roughly linear in the sense that a higher pay grade in this range generally makes more than a lower pay grade in this range; however, this is somewhat dependent on job family (i.e. technical versus non-technical) such that a lower pay grade technical worker may make more than a higher pay grade non-technical worker. They are roughly non-overlapping in the

17

sense that each pay grade represents a range of salaries, and the lower salaries in a higher pay grade should generally be higher than the higher salaries in a lower pay grade; however, we are told there is more overlap the higher up you go, such that in the higher echelons a higher pay grade even within the same job family and function may not translate to a higher actual salary. Despite this noise, the data are still quite meaningful as we can control down to the job title and the number of employees in the upper ranges of that scale is not that great. Finally, since pay grades are also used for different purposes, there are some pay grades outside of the 2 to 20 range which we are able to translate into that range; we have added a flag for these translated pay grades in our analyses.

Our dependent variable of performance is derived from the performance ratings provided in the data set. We are told there are four meaningful distinctions: "B," or below expectations and "I," or improvement required make up the lowest category of performance ratings; "S," or successful makes up the next; "E," or excellent, makes up the category following; and "O," or outstanding makes up the highest category. Because a significant portion of the performance appraisals are in the successful category, we were provided stock share levels to further differentiate performance. Stock share levels range from 1 to 5 and are given out based on a relative performance decision, in line with but separate from the base performance ratings. Therefore, we constructed a linear scale of performance ratings plus stock share levels, such that a below expectations or improvement required with a stock share level of 5 makes up the lowest category, and an excellent with a stock share level of 1 makes up the highest category[2].

In addition to our independent variable of erraticism and our dependent variables of pay and performance, we have a rich set of controls, both raw and derived, that we can use to rule out alternative explanations. The most notable derived controls we generated was a set of hierarchy variables describing the number of ranks above and ranks below an employee at a given time; we used the unique manager identifier to construct this hierarchy. To do so, we first determine which supervisors in our data set either

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[2] Using only the performance rating and eliminating the stock share does not change our results.

18

have no supervisor, or whose supervisor is not in the data set, and mark these as the top of our hierarchy. Then, we follow the chain down, such that each link in the chain represents a rank. For example, if employee x has a supervisor in time period t, and that supervisor also has a supervisor, then employee x would have two ranks above him or her. The reason we generate such a hierarchy structure is so we can better determine what constitutes a horizontal or vertical move.

In order to examine the effect of erratic movements apart from movements that are vertical (and likely result in a certain pay or performance difference) and horizontal, we needed a measure that would capture the directionality of movement. Therefore, we define a vertical move as a move in which one changes hierarchy structure, where a vertical up move would be either having fewer ranks above, or greater ranks below, and a vertical down move would be either having more ranks above, or fewer ranks below. Because organization structure is not always rigid, we allow for independent effects regarding ranks above and ranks below. Then, we code an "any change" variable that captures other potential events, such as gain in manager status, loss in manager status, change in pay grade or pay grade group, change in organizational units, or change in job family, type, or coarse job family. By capturing what we believe to be vertical moves as well as any other type of change, the remainder is controlled for as horizontal moves. Note that this formulation allows for robustness checks around the definition of vertical moves – if we were to define vertical moves more stringently, such that an employee needs a hierarchical change as well as a gain in manager status, for example, then we could examine the effect of that stricter vertical move.

This in addition to our other sets of controls allows us to rule out some common alternative explanations. For example, it could be argued that the longer one is in the organization or works in one's specific job function, the better pay and performance reviews one would get, regardless of how one moves. For such a reason, we control for organizational tenure, both in the organization as a whole as well as in the organizational unit, and job tenure. A second argument could be made from the literature that managers who share similar features are susceptible to homophily effects (Castilla, 2011). This is

certainly reasonable, and for this reason we control for whether one's supervisor is of the same gender or not. A third argument could be made that there is some inherent quality difference that results in differential effects for pay and performance. Not only would that difference have to be consistent and correlated with our variables of interest, but also we attempt to control for it by using proxies such as college major, highest degree earned, and exit type.

Analyses and Results

We construct two sets of analyses to answer our original question of the differential effects of more or less atypical mobility on men and women. The first set examines the effects of lagged erraticism on pay and performance in the next period. Performance appraisals are performed on a yearly basis, so we condense the observations to yearly observations, being careful to leverage the more granular data we have, and perform pooled OLS regressions predicting next period performance ratings. Pay grade discussions do not seem to be as uniform, but we nevertheless also condense the observations to yearly observations, as pay grade rarely changes within the year, and to match our next period performance appraisal analysis. The second set examines an overall effect of these mechanisms over the course of one's entire career. We regress the ending pay grade, taking into account censoring, on starting characteristics as well as within career mobility to obtain a picture of how the next period mechanisms might accumulate over time.

Our first model is a pooled OLS regression of next period performance rating plus stock share level on gender, erraticism, and their interaction (Table 5). We control for a number of factors, including historical effects; demographics, such as age group, ethnicity, major, and highest degree earned; tenure, such as the time one has spent in one's current job, the time one has spent in one's current organizational unit, and the time one has spent in the organization as a whole; geography, such as the location of one's local office; job characteristics, such as one's job title, one's place in the organizational structure, one's

supervisor, one's shift type, whether one is a manager or not, one's exempt status; supervisor homophily, specifically if one's supervisor is of the same gender; and other related factors, such as if one started one's career during the observation period, whether one is flagged as a high or low performer, one's exit type, and whether one was acquired or not; finally, we include controls for vertical and horizontal moves, which were explained in a previous section. We additionally cluster standard errors on the individual employee, as separate observations for the same employee would be undoubtedly related.

[Insert Table 5 about here]

The results from the full model show that there is a significant and negative differential effect of erraticism on gender ($p < 0.01$). This means that for women, being more erratic results in a lower performance rating in the next period on average than similarly erratic men. What is perhaps even more striking, though, is that this effect overcomes the significant ($p < 0.05$) positive main effect of erraticism. Therefore, not only do women do worse the more erratic they are ($\beta = 0.080 - 0.143 = -0.063$), but also it seems to benefit men to be erratic ($\beta = 0.080$).

These general effects are presented visually in Figure 8 below. The horizontal axis is erraticism and the vertical line is pay grade. As women, indicated by the red line, increase their erraticism, their next period performance appraisals decrease. This effect is the opposite for men. As they increase in erraticism, their performance appraisals increase as well.

[Insert Figure 8 about here]

Our second model is the parallel pooled OLS regression for next period pay grade on gender, erraticism, and their interaction (Table 6). We include the same controls as in our performance model, with the addition of starting pay grade and last performance rating plus stock share level. The rationale for including starting pay grade is that it should have a strong effect on your next period pay grade. If one's starting pay grade is already high, it is unlikely that it would go much higher; conversely, if one's starting pay grade is low, there is much room for it to increase. The rationale for including last performance rating

plus stock share level is that it should exert an influence on next period pay to the extent that performance appraisals influence pay grade decisions. Again, we cluster standard errors on the individual employee.

[Insert Table 6 about here]

The results from the full model show that there is a significant and positive differential effect of erraticism on gender ($p < 0.001$). Specifically, for women, being more erratic results in a higher pay grade in the next period on average. This is to be interpreted in conjunction with the significant main effects, where it seems that women seem generally disadvantaged compared to men ($p < 0.001, \beta = -0.031$), and men seem to benefit from being erratic, but not as much as women ($p < 0.001, \beta = 0.150$). These results suggest that in order for women to overcome their overall pay grade disadvantage, they would need to be rather erratic as compared to men, considering that the main effect and interaction effect sizes are not all that different. These general effects are presented visually in Figure 9 below.

[Insert Figure 9 about here]

Our third model is an OLS regression for ending pay grade on gender, erraticism, and their interaction (Table 7). The intuition here is that we want to consider, conditional on where employees started, how mobility differentially effects end results, giving us a better picture of how period effects might accumulate over time and translate into an aggregate effect. Here, we control for a number of starting characteristics, including similar categories as before: historical effects; demographics, such as age group, ethnicity, major, and highest degree earned; geography, such as the location of one's local office; job characteristics, such as one's job title, one's coarse job family, one's place in the organizational structure, one's supervisor, one's shift type, whether one is a manager or not, one's exempt status; supervisor homophily, specifically if one's supervisor is of the same gender; and other related factors, such as if one started one's career during the observation period, whether one is flagged as a high or low performer, one's exit type, and whether one was acquired or not. However, we also additionally control for one's starting pay grade, one's starting hierarchical position, and one's starting performance

rating. After starting conditions, we minimally control for ending effects, such as if one ends in a manager position, and if one ends in a translated standardized pay grade. Perhaps most importantly, we control for interim effects, such as the one's overall tenure in the organization, the number of managers one had over the course of one's career, the mean performance rating plus stock share level as well as the variance, and the number of vertical and horizontal moves.

[Insert Table 7 about here]

The results from the full model show that there is a significant and positive differential effect of erraticism on gender ($p < 0.001$). In accordance with the next period model, it appears to differentially benefit women to be erratic with respect to their ending pay grade. Again, however, we see the same pattern of main effects, such that there is a general disadvantage for women as compared to men ($p < 0.001, \beta = -0.073$), and a general benefit for men to be erratic ($p < 0.01, \beta = 0.026$). Note, however, that in this case, the interaction effect is far greater in magnitude than the main effect of erraticism, indicating that there are wider disparities in benefits for being erratic between men and women. These general effects are presented visually in Figure 10 below.

[Insert Figure 10 about here]

Discussion and Next Steps

Our investigation highlighted a conundrum women face in organizations. Because they often enter in lower paying jobs and on job ladders that offer less potential for advancement, they likely have to accomplish intra-organizational moves that are less typical in order to secure better pay or promotion opportunity. However, movement that is atypical, what we labeled as more erratic, is often not tolerated precisely because it is not familiar. We label this the dilemma of mobility. We investigate this dilemma on the internal careers of women and men at TechCo over an eight year period from 2008 though 2015. We find that there are differential effects of erratic internal job mobility on women and men, though the outcomes are surprising. Specifically, more erratic women receive lower performance appraisals while

23

more erratic men receive higher performance appraisals. However, the effect on pay is the opposite. Here, the more erratic women are, the greater their pay while more erratic men do not get a similar pay increase.

One possibility is that women and men are differentially selected to enter and depart the firm, thereby contributing to our observed effects. For example, if there were a tighter external labor market for Women than Men; that is, talented women engineers and managers in technology firms were more sought after in our observation period than similarly skilled men. In this case, women that are erratic, who have displayed a willingness to move for their career, would also be more likely to leave TechCo than to stay, relative to similarly talented men. If they are more likely to leave, then that may result in the remaining women being, on average less talented (resulting in lower performance appraisals) but also more likely to be able to demand higher pay because TechCo wished to retain women. To ensure there is no differential effect of selection, plan to examine the likelihood that erratic movement may also differentially affect a women versus a man's likelihood of exiting the firm voluntarily. We will incorporate exit data on all employees who have left TechCo over this same period. All exits from TechCo are tracked as being either Voluntary or Involuntary. Involuntary exits are generally dismissals for competence or illegal behaviors. Voluntary exits are those where the employee themselves initiated the exit. For all exits at TechCo, approximately 50% are involuntary. Our analyses will investigate whether erratic movement, is more or less likely to lead to Voluntary, as opposed to Involuntary exit. Furthermore, we will reveal whether or not erratic job mobility differentially affects exits by the employee's gender. If so, we could point to two possible reasons. First, to the extent that Involuntary exit is more likely a signal of poor performance than Voluntary exit is, then erratic internal mobility is likely not a clear signal of lower skill. Second, if there is no differential effect of erratic behavior on Voluntary exits by women and men suggests to us that there it likely not a differential selection mechanisms to exits that drive our results.

Another hypothesis is that women who move dramatically to progress in their careers are able to negotiate for greater pay. However, their behavior is considered non-normative and may seem overly ambitious, so they therefore suffer a perceptual discount and are rated poorly by their supervisors.

Informants at TechCo have suggested that women who move erratically in their careers have been labeled as "traitors" and were not "loyal." To figure this out, we checked if women and men who actually progress along identical paths have similar outcomes because our outcomes may be a function of women and men taking different paths. To account for this, we plan to match each women's career path with the five closest men with identical backgrounds as well as career histories. We would then divided the individuals into quintiles based on their erraticism to see if women and men diverge in their performance ratings or pay across this spectrum. To the extent we believe there is a differential perception of women and men on their erratic careers, we would see a difference in outcomes across this spectrum.

Another explanation we plan to identify is whether this differential effect is isolated to women and men located in the upper part of the pay hierarchy, and not for women in lower pay grades. Much extant work suggests that women are promoted similarly to men higher in the hierarchy than they are lower in the hierarchy. We plan to split the sample into those individuals who enter the firm at the higher pay grades versus lower ones. TechCo informants explained to us that pay grade 9 and above are considered 'managers' By splitting the sample into upper and lower hierarchy will allow us to identify where in the ladder these differential effects may be isolated.

Open Issues

- Starting pay grade split at 9 - 2-8 vs. 9+
- Differential results are a different population
    - Lower starting pay, erratic women is bad for performance, but not for higher starting pay
    - Lower starting pay, erratic women is good for pay,
- Is this the cause or consequence of getting to a higher pay grade?

References

Althauser, Robert P. and Ame L. Kalleberg 1981. "Firms, Occupations, and the Structure of Labor Markets: A Conceptual Analysis." Pp. 119-149 in Ivar Berg (editor), *Sociological Perspectives on Labor Markets*, New York: Academic Press.

Bielby, William T., and James N. Baron. 1984. "A Woman's Place Is with Other Women: Sex Segregation within Organizations." Pp. 27-55 in Sex Segregation in the Workplace: Trends, Explanations, Remedies, edited by Barbara F. Reskin. Washington, D.C.: National Academy Press.

Baron, James N., Alison Davis-Blake and William T. Bielby 1986. The Structure of Opportunity: How Promotion Ladders Vary Within and Among Organizations. Administrative Science Quarterly, Vol. 31, No. 2, pp. 248-273.

Baron, James N. 1984. "Organizational Perspectives on Stratification." *Annual Review of Sociology*, Vol. 10, pp. 37-69.

Blair-Loy, Mary 1999. Career Patterns of Executive Women in Finance: An Optimal Matching Analysis. *American Journal of Sociology*, Vol. 104, pp. 1346-1397.

Castilla, E.J. 2008. "Gender, Race, and Meritocracy in Organizational Careers. *American Journal of Sociology*, Vol. 113, No. 6, pp. 1479-1526.

Castilla, Emilio J. "Bringing Managers Back In Managerial Influences on Workplace Inequality." *American Sociological Review* 76.5 (2011): 667-694.

Cohen, Philip N. and Matt L. Huffman. 2003. Individuals, Jobs, and Labor Markets: The Devaluation of Women's Work. American Sociological Review, Vol. 68, No. 3, pp. 443-463.

DiPrete, T. A. & Krecker, M. L. 1991. Occupational linkage and job mobility within and across organizations. *Research in Social Stratification and Mobility*, 10: 91-131.

DiPrete, T.A. 1987. "Horizontal and Vertical Mobility in Organizations" *Administrative Science Quarterly*, Vol. 32, No. 3, pp. 422-444.

DiPrete, Thomas A. and Whitman T. Soule. 1988. Gender and Promotion in Segmented Job Ladder Systems. American Sociological Review, Vol. 53, No. 1, pp. 26-40

Doeringer, P.B. and Piore, M.J. 1971. *Internal Labor Markets and Manpower Analysis*, Lexington, Massachusetts: Heath.

England, Paula 1984. "Explanations of job segregation and the sex gap in pay." *Comparable Worth: Issue for the 80 o*, Vol. 1, p. 54.

England, Paula, Melissa S. Herbert, Barbara Stanek Kilbourne, Lori L. Reid and Lori McCreary 1994. "The Gendered Valuation of Occupations and Skills: Earnings in 1980 Census Occupations." *Social Forces*, Vol. 73, No. 1 (Sep., 1994), pp. 65-100

Felmlee, D. H. 1982. Women's job mobility within and between employers, *American Sociological Review,* 47: 142-150.

Grusky. Oscar. 1966. Career Mobility and Organzational Commitment. Administrative Science Quarterly, Vol. 10, No. 4, pp. 488-503.

Haltiwanger, John C., Ron S. Jarmin, and Javier Miranda 2012. "Who creates jobs? Small vs. large vs. young. Working Paper 16300, National Bureau of Economic Research, Cambridge, Massachusetts.

TechCo. 2015 *Annual Report: Diversity and Inclusion*

Kerckhoff, Alan C. 1995. "Institutional Arrangements and Stratification Processes in Industrial Societies." *Annual Review of Sociology*, Vol. 15, pp. 323–47.

Leung, Ming 2014. "Dilettante or Renaissance Person? How the Order of Job Experiences Affects Hiring in an External Labor Market. *American Sociological Review*, Vol. 79, No. 1, pp. 136-158.

Petersen, Trond and Laurie A. Morgan 1995. "Separate and Unequal: Occupation-Establishment Sex Segregation and the Gender Wage Gap." *American Journal of Sociology*, Vol. 101, No. 2, pp. 329-365.

Petersen, Trond and Ishak Saporta. 2004. The Opportunity Structure for Discrimination. American Journal of Sociology, Vol. 109, No. 4, pp. 852-901.

Pfeffer, Jeffrey and Yinon Cohen. 1984. Determinants of Internal Labor Markets in Organizations. Administrative Science Quarterly, Vol. 29, No. 4, pp. 550-572.

Rosenfeld. Rachel A. 1980. Race and Sex Differences in Career Dynamics. American Sociological Review, Vol. 45, No. 4, pp. 583-609.

Sorensen, A. B., Tuma, N. B. 1981. Labor market structures and job mobility. Res. Soc. Strat. Mobil. 1:67-94

Spilerman, Seymour 1977. "Careers, Labor Market Structure, and Socioeconomic Achievement." *American Journal of Sociology*, Vol 83, pp. 551-593.

Spilerman, Seymour and Trond Petersen. 1999. Organizational Structure, Determinants of Promotion, and Gender Differences in Attainment. Social Science Research 28, 203–227.
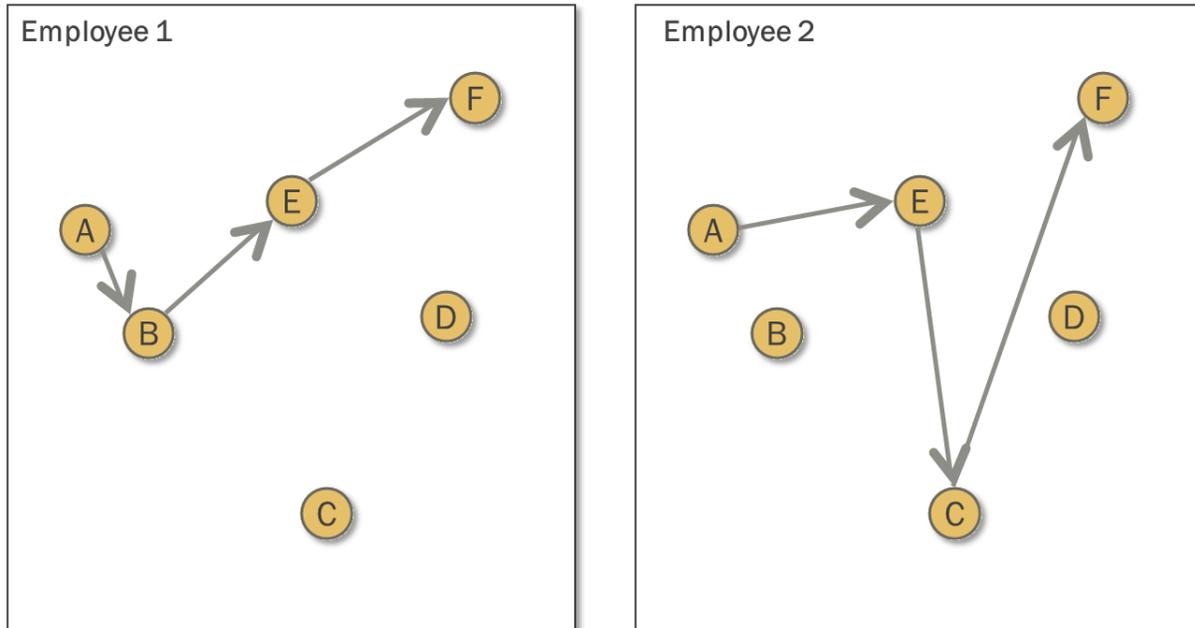
Figure 1

Table 1: Employees Starting Career by Coarse Job Family

	Coarse Job Family	Males	Females	Male Ratio	Female Ratio	Total
1	Eng - HW Logic Design	2,393	724	0.159	0.143	3,117
2	Eng - SW Development	1,995	577	0.132	0.114	2,572
3	Eng - Manufacturing Development	1,391	450	0.092	0.089	1,841
4	Eng - HW Analog	920	311	0.061	0.061	1,231
5	Eng - System/Platform/Solution	793	178	0.053	0.035	971

Table 2: Top 5 Male Dominated Coarse Job Families

	Coarse Job Family	Males	Females	Male To Female Ratio
1	Eng Mgmt - SW Management	104	8	13
2	Invest - Support	10	1	10
3	Eng Mgmt - HW Management	480	51	9.412
4	Sales - Support Tech	75	12	6.250
5	Eng - Wireless/Communications/Modem Platform	389	63	6.175

Table 3: Top 5 Female Dominated Coarse Job Families

	Coarse Job Family	Males	Females	Male To Female Ratio
1	Public Affairs - Support	2	10	0.200
2	HR - Partner	16	55	0.291
3	HR - Support	4	12	0.333
4	HR - Communication	4	11	0.364
5	HR - Training	8	21	0.381

Table 4: Starting Pay Grade by Gender

	Dependent variable:			
	Pay Grade			
	(1)	(2)	(3)	(4)
Female	−0.554**	−0.199**	−0.098**	−0.096**
	(0.029)	(0.019)	(0.021)	(0.021)
Time Controls	YES	YES	YES	YES
Demographic Controls		YES	YES	YES
Job Characteristic Controls			YES	YES
Exit Type Controls				YES
Performance Rating Controls				YES
Observations	20,152	20,152	20,152	20,152
R^2	0.040	0.582	0.914	0.915
Adjusted R^2	0.039	0.582	0.813	0.814

$^{+}$p<0.1; *p<0.05; **p<0.01

Table 5: Next Period Performance by Gender and Erraticism

	Next Period Performance			
	Performance			
Female	0.019 (0.028)		0.018 (0.028)	0.062 (0.032)
Erraticism		0.042 (0.034)	0.042 (0.034)	0.080* (0.036)
Female:Erraticism				−0.143** (0.049)
Observations	257,868	257,715	257,715	257,715
Note:			*p<0.05; **p<0.01; ***p<0.001	

Table 6: Next Period Pay Grade by Gender and Erraticism

	Next Period Pay Grade (2-20)			
	Pay Grade			
Female	−0.017** (0.006)		−0.018** (0.006)	−0.031*** (0.006)
Erraticism		0.162*** (0.007)	0.162*** (0.007)	0.150*** (0.007)
Female:Erraticism				0.043*** (0.009)
Observations	257,904	257,750	257,750	257,750
Note:			*p<0.05; **p<0.01; ***p<0.001	

Table 7: Ending Pay Grade by Gender and Erraticism

	Ending Pay Grade (2-20)			
	Pay Grade			
Female	−0.016		−0.017	−0.073***
	(0.009)		(0.009)	(0.011)
Erraticism		0.054***	0.054***	0.026**
		(0.008)	(0.008)	(0.009)
Female:Erraticism				0.117***
				(0.015)
Observations	52,599	52,599	52,599	52,599
Note:			*p<0.05; **p<0.01; ***p<0.001	

Figure 2

Mean Starting Pay Grade by Coarse Job Family

Figure 3

Proportion of Males and Females by Job Title Changes

Figure 4

Second Job Title for Component Design Engineers

34

Figure 5

Job Title Change Pay Grade Bonus for Component Design Engineers
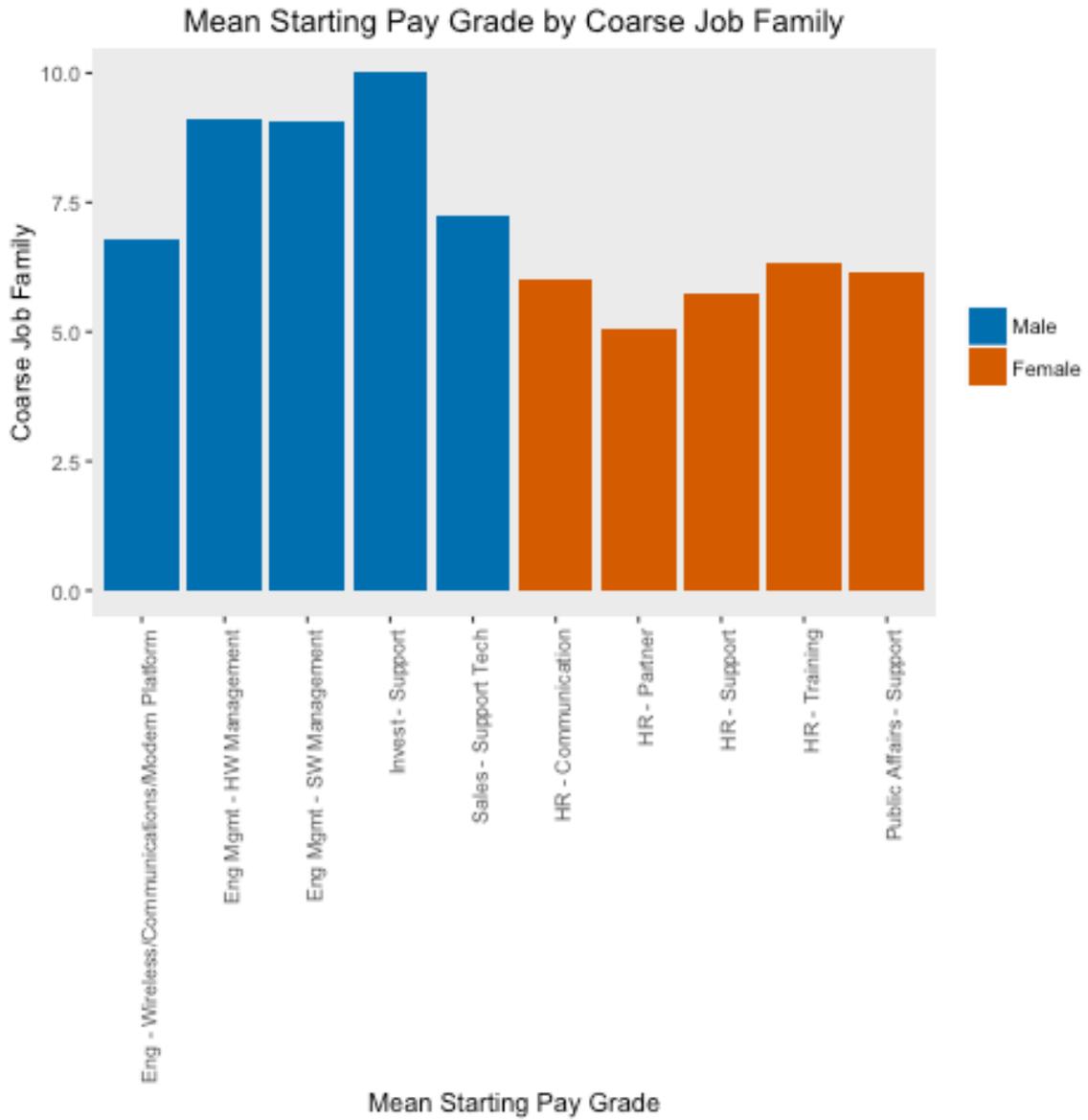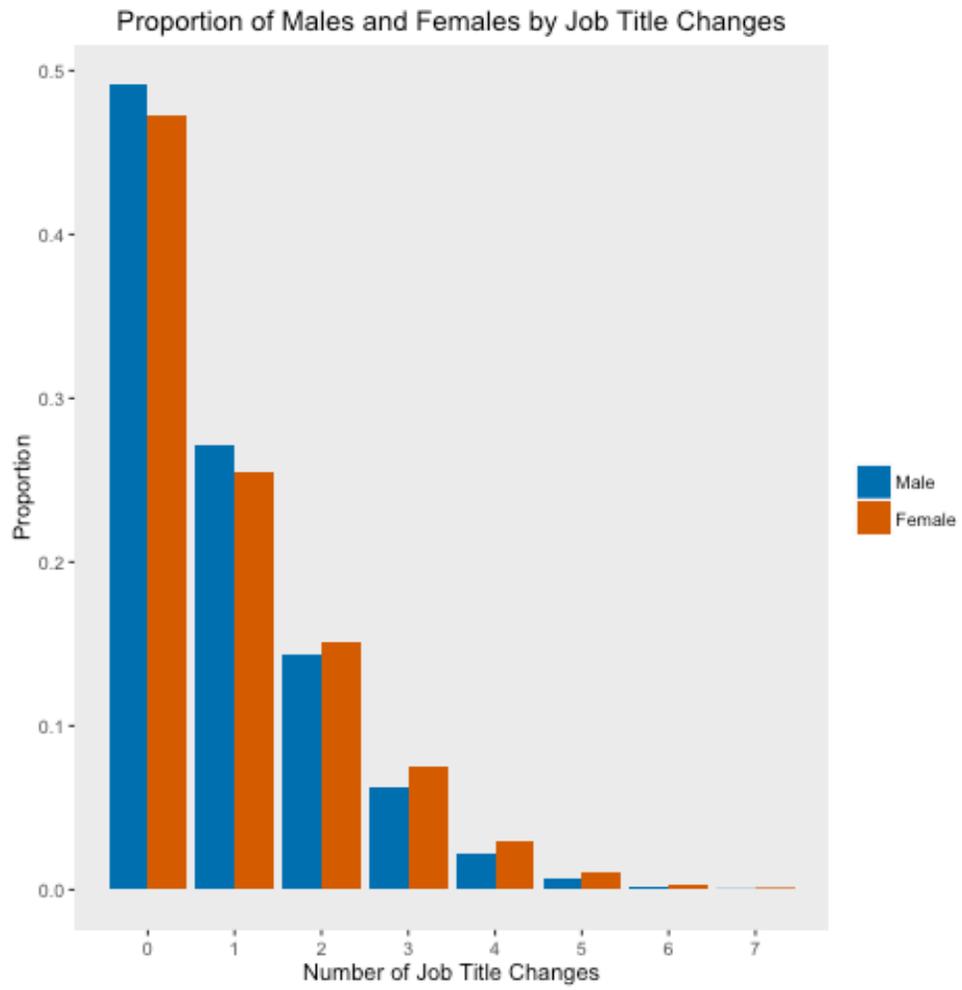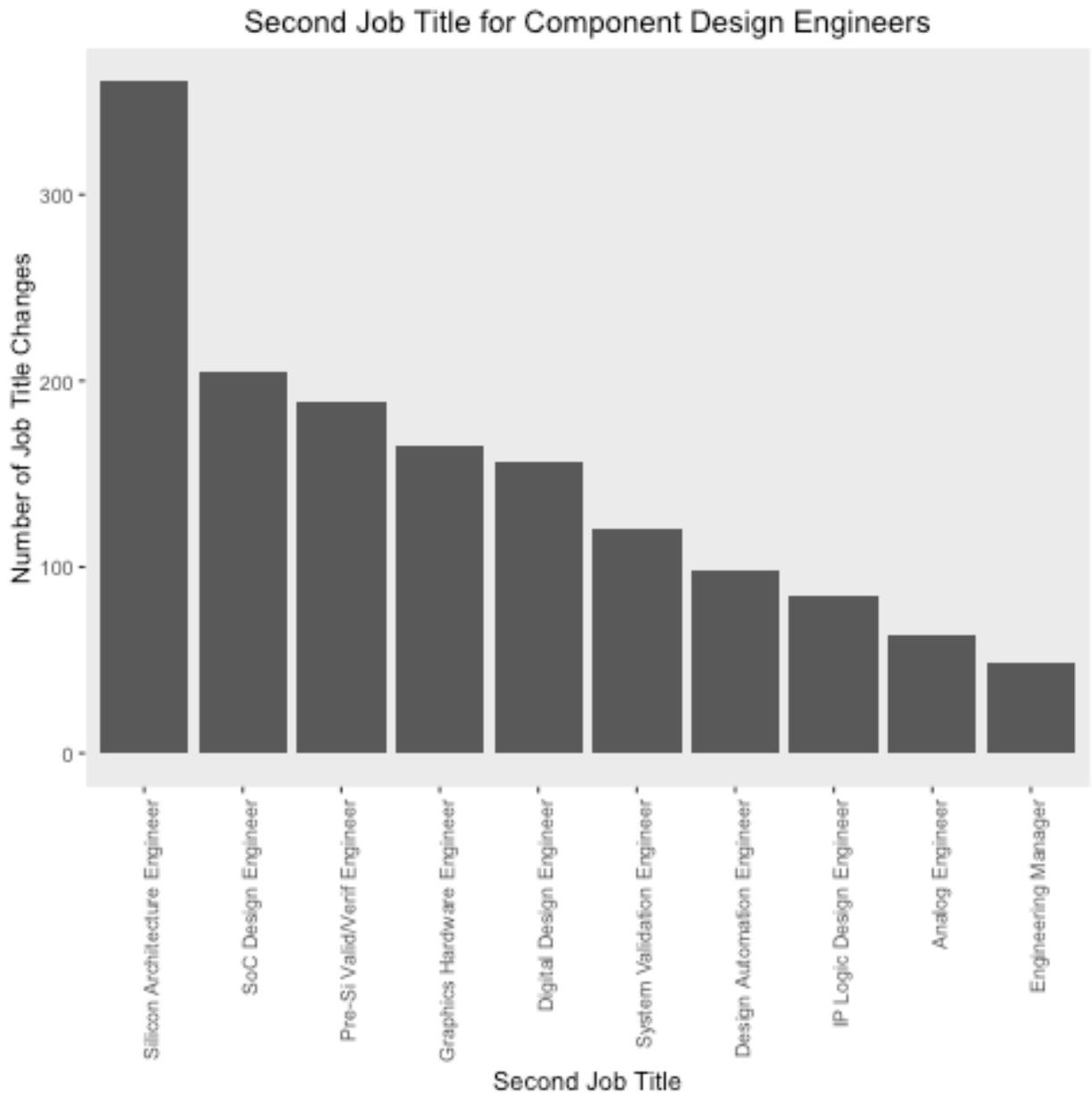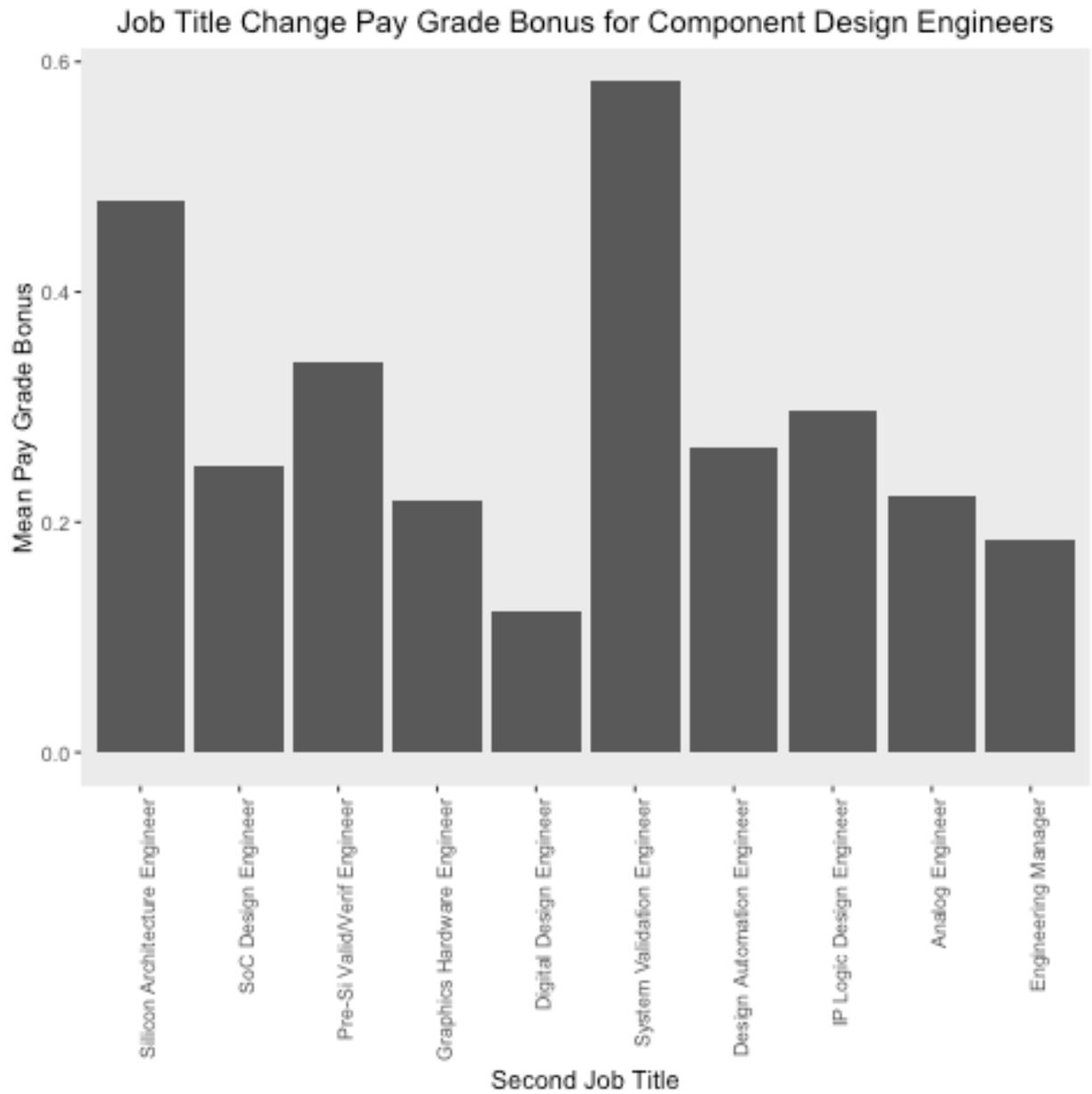
Figure 6

Distribution of Erraticism of Moves

Figure 7

Distribution of Erraticism of Moves by Gender (Proportional)

Figure 8

Next Period Performance By Gender and Erraticism

Figure 9

Next Period Pay Grade By Gender and Erraticism

Figure 10

Ending Pay Grade By Gender and Erraticism