LU LUO

Firm Internal Labor Markets, Flexible Staffing, High Performance Work Systems and Training in the United States

(Under the Direction of William Finlay)

Job training, as a core element of employment relationship in America, has received great attention in the literature. Using data recently available from National Organizations Survey II, I explore the relationship between the provision of job training with some inter-related issues, namely Firm Internal Labor Markets, flexible staffing practices and High Performance Work Systems. Findings from this study show that despite the popular view of the erosion of internal labor markets, FILM remains an important predictor of training. Evidence also points out that establishments with the use of oncall workers provide more training to core employees. The incentive and skill dimensions of HPWS are shown to be positively associated with training, whereas the discretion dimension does not seem to have a significant effect on training. The study highlights the different effects of HPWS dimensions and components, and stresses the importance of a disaggregate approach towards HPWS practices.

INDEX WORDS: Sociology of Work, Sociology of Organization, Training, Internal Labor Markets, Flexible Staffing, Contingent Employment, High Performance Work Systems, High Performance Organizations, Core Employee, Skill, Oncall Worker, Part-time Worker, Temporary Employment, Work Organization, Human Resources Practice, Employment Relationship

FIRM INTERNAL LABOR MARKETS, FLEXIBLE STAFFING, HIGH PERFORMANCE WORK SYSTEMS, AND TRAINING IN THE UNITED STATES

by

LU LUO

B.A., Beijing Foreign Studies University, China, 1999

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirement of the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2002

FIRM INTERNAL LABOR MARKETS, FLEXIBLE STAFFING, HIGH PERFORMANCE WORK SYSTEMS, AND TRAINING IN THE UNITED STATES

by

LU LUO

Approved:

Major Professor: William Finlay

Committee: James Coverdill
Linda Renzulli

Electronic Version Approved:

Gordhan L. Patel
Dean of the Graduate School
The University of Georgia
May 2002

For my family and friends

ACKNOWLEDGEMENTS

My deepest gratitude is to my major professor, Dr. William Finlay, whose guidance, support and patience have helped me greatly all the way through this project. I am full of appreciation to my two other committee members, Dr. James Coverdill whose powerful critique on the draft and continuing help with data processing have made the thesis stronger than it would otherwise have been, and Dr. Linda Renzulli whose incisive comments and clear direction have helped me tremendously. To these respected professors, I am and shall forever remain grateful.

I would like to thank Dr. Jeremy Reynolds, for providing invaluable information on the dataset. Without his knowledge and kindness in sharing, the project would be far more difficult. And I thank my cohort of sociology graduate students for giving candid feedback and sincere suggestions for improvement.

I thank my dearest friend, Ruirui, for his unswerving faith in our future, and for his most touching persistence. I am indebted to my friends, in the U.S. and back in China, especially to Cai Jing, Xiao You, Wang Wen and Yanying, for their warm support, even at times when difficulties seem overwhelming.

The thesis is to my grandmother, who passed away without seeing me completing the work and degree. And it is to my parents and sister, who are as close to me as ever, although far away in China.

It is to them that this thesis is dedicated.

TABLE OF CONTENTS

Page

CHAPTER 1

INTRODUCTION

Job training, as an important aspect of human resource practices and a core element of employment relationship in America (Knoke and Kalleberg, 1994), has received great attention in the literature on work and organizations. With the economic turbulence of the last quarter of a century bringing about technological revolution and mounting international competition (NRC, 1999), interest in the topic revived in business, academic and public arenas. Evidence has suggested that U.S. under-investment in training relative to its competitors might be a potential cause for the severe challenges faced by firms in America (Kochan and Osterman, 1991). Discussion on training in the transformed economy resumes momentum with significant policy implications: training is held both as a competitive strategy in its own right (Appelbaum and Batt, 1994) and as part of a policy solution to the U.S. labor force problem of a standing "skill gap" (U.S. Department of Labor, 1989).

Previous sociological research on job training has posited that the structural and contextual characteristics of organizations, such as firm size, bureaucracy, union power, and external environment greatly affect the availability and extent of employer-provided training programs (Duncan and Stafford, 1980; Baron, Black and Lowenstein, 1987; Knoke and Kalleberg, 1994; Knoke and Ishio, 1994; Osterman, 1995). Central to the understanding of the provision of training associated with traditional work settings is the firm internal labor market (FILM).[1] FILMs are defined as the promotion trajectories that

[1] Firm Internal Labor Market is abbreviated as FILM and will be referred to as such in the following section.

link jobs within an organization and are characterized by graded job ladders in terms of pay and status (Osterman, 1984).[2] FILMs, while sheltering employees from the challenge of external labor markets, reflect the traditional employment relationship featured by job security and employers' commitment. Further, they encourage within-firm career advancement by cultivating training-acquired competencies and by filling higher-level positions predominantly or exclusively through internal promotion (Marsden and Cook, 1994). Thus, formal training programs are normally regarded as an integral part of a well-developed internal labor market (Barron, Black and Loewenstein, 1987).

Recent changes in the workplace have led some scholars to report an erosion of firm internal labor markets (Osterman, 2000) and others to conclude that FILMs are undergoing a deconstruction (Cappelli, 1995). Besides the evidence in rising turnover, decreasing job tenure and downsizing, one aspect of this transition is reflected in the phenomenon of the expanded use of flexible staffing practices. Employers seem to be redefining relationships with their employees: the implicit long-term employment guarantee and career paths within a single enterprise are disappearing (Moss, Salzman and Tilly, 1998). Smith (1997) used the term "numerical flexibility" to describe "the ascent of contingent jobs and workers and the decline of the permanent employment model" (p. 316).[3] Such a paradigm shift implies that once commitment is absent, employers view workers as a burden to be shed, if possible. The blatant effort to lower labor costs contradicts the ideal of investing in human development through providing increased training opportunities.

The other parallel ongoing change is, to use the words of Smith (1997), organizations' search for "functional flexibility," namely the mechanisms and work flow

[2] The term was first coined by Dunlop (1966), but here I use a better-developed definition from Osterman.
[3] The concept of functionality flexibility and numerical flexibility was first mentioned in the book *The Transformation of Work?: Skill, Flexibility and the Labor Process*, edited by Wood SJ. But here we will borrow from Smith's recapitulation.

innovations that build in employee involvement. Such a trend is best captured by High Performance Work Systems (HPWS),[4] which are intended to encourage employee involvement and commitment, and to enable firms to respond more effectively to market changes. High Performance Work Systems may, however, weaken firm internal labor markets. As a key dimension of HPWS is substituting hierarchy with multi-functional teams, it levels the internally fine-graded job ladder.

My triangle of interest revolves around three themes with regard to firms' training practices. First, although there might be evidence suggesting the decline of firm internal labor market, its influence on how organizations structure and function may not be obsolete. Some studies show that despite the implication of some case studies, aggregate indicators of the vigor of FILMs have changed relatively little (Bernhardt and Marcotte, 2000). So the first question I ask in this paper is whether the firm internal labor market still plays an important role in explaining the provision of training opportunities in the new transformed economy.

Second, the two-tiered labor market model proposes that the workforce is stratified into two horizontal segments, with core workers conducting the organization's key firm-specific activities in the center, surrounded by a cluster of peripheral groups performing jobs less crucial to the main business or service of the organization (Atkinson, 1985). Core workers typically receive better pay and benefits, whereas none-core workers usually earn less and work in lower skilled jobs (Smith, 1997). In line with such theorizing, the flexible staffing practices adopted by employers with the blatant intent to cut costs certainly implies dim training prospects for the peripheral workers. But questions remain as to whether and how this attitude of "labor-as-cost" affects core workers. In other words, my second interest lies in examining whether organizations that

[4] High Performance Work Systems is abbreviated as HPWS and will be referred to as such in the following section.

employ flexible staffing practices are also less likely to provide training to their core employees.

Third, I examine the effect of HPWS, the new work organization, on employee training. Most reports of popular accounts and cases come from a managerial perspective, and usually the same people who have devised and implemented the innovation provide the survey information. The picture thus emerged probably overstates the degree of innovation and change actually taking place (Appelbaum and Batt, 1994). Within this framework, the HPWS is usually treated in a positive light, attributed with the power of increasing firm performance and improving worker experience. More often than not, better training opportunities for employees are taken as a given, rather than as a hypothesis to be tested. In the scholarly discussion, some researchers have included the provision of training as a benchmark of whether an organization is transformed, based on the reasoning that multi-skilling teamwork and job rotation are central features of HPWS and entail greater demands on employees' skill. But we must realize that the HPWS does not automatically guarantee training. For instance, training and selection can supplement each other in meeting organizations' skill demands (Appelbaum and Berg, 2000). Thus, my third interest is to address the issue of whether HPWS brings employees more training opportunities, in reality rather than in rhetoric.

A growing body of literature has emerged trying to tackle these related questions, but the result is not conclusive yet for several reasons. To begin with, in order to explore the issue in some in-depth fashion, researchers need surveys that provide detailed information on topics of firm HR practices, innovations and training. Unfortunately, few surveys meet the entire data requirements. Second, even within the limited pool of national surveys, representative samples are lacking. In particular, almost all previous studies have sampled only organizations with at least 20 or 50 people (U.S. General Accounting Office, 1987; Osterman, 1994). Even the Bureau of Labor Statistics reports training information only on organizations with an establishment size of at least fifty. The

rationale is that smaller establishments often have no formal training (Frazis, Gittleman, Horrigan and Joyce, 1998). Given the fact that in reality over half (54.7%) of the work organizations in the United States have fewer than four employees (Kalleberg and Reynolds, 2000), findings from previous studies may not be generalizable to all establishments and may not reflect accurately nationwide training practices. Third, previous research on training has not clearly distinguished training received by core employees from that received by all employees within an establishment. But my review of the two-tiered employment system suggests that failing to do so could mask the true condition of training practice, as the result of what are likely to be different opportunities for core and peripheral workers. Results from studies of non-uniform groups overlooking the bifurcation of the workforce may not be directly comparable to each other. Last but not least, the conventional measurement approach towards HPWS by aggregating headcounts of the presence of some innovative practices might be potentially problematic. Some cautious researchers have already raised concerns over this issue and have shown preference for a more systematic approach for organizational transformation (Bailey, 1992; Kalleberg, 1997; Appelbaum and Batt, 1994). Further, the operationalization of HPWS in previous research is very inconsistent. Some studies place firms into different HPWS levels based on the number of practices present in organizations; whereas others recognize only practices with over 50% penetration level as valid HPWS innovations.[5]

This study hopes to advance current discussion using a dataset recently available from the National Organizations Surveys Wave II (1996-1997). Drawing a random sample from approximately 15 million work establishments in Dun and Bradstreet's Information Services data file, NOS II has some merits over previous collections of data. Not only does it include establishments of all size, NOS II data, using a stratified

[5] The BLS study series are examples of the first type, and Osterman's study exemplifies the second approach (Osterman, 1995).

sampling method, also yields a national representative sample of establishments (Kalleberg, Knoke and Marsden, 1995; Kalleberg and Reynolds, 2000). [6] Rich information can be found on firms' practices in human resources, flexible staffing and high performance work organizations. Furthermore, questions on formal training in the data are directed towards core workers exclusively, [7] avoiding a potential pitfall of measurement error. These merits of the data collection position me well in addressing issues of interest to my study.

In addition to the unique advantages given by the data collection, I hope to contribute to the literature of HPWS and training by exploring in greater detail how different dimensions or components of the HPWS affect the provision of training opportunities to employees. Starting with the conventional approach, I highlight the limitation of such an approach in capturing the central idea of a system of HPWS practices and raise the possibility that different components of HPWS characteristics might in fact have different bearings on the provision of training. Based upon the literature's discussion of distinct clustering of HPWS characteristics (Kalleberg and Moody, 1997; Appelbaum, Bailey, Berg and Kalleberg, 2000), I then proceed to break down the components of HPWS and test their independent effects on training. Results from the analysis have important implications for future researchers on HPWS. Although the literature suggests that an integrated system approach is needed to study HPWS, my analysis suggests that different dimensions of HPWS might have varying effects on training. A closer look at how that is possible, either from more statistical analysis or

[6] As establishments in the US are overwhelmingly dominated by those with small employment size, large organizations are over sampled to yield enough cases for a meaningful analysis. A weight variable is included assigning different weight to each case to adjust for the chances of selection according to the distribution of establishment sizes across the workplace. Using the weighted analysis, we will be able to get the information across all establishments in the U.S..

[7] Core employees are defined as the employees involved in the main product or services of the organization (Knoke and Kalleberg, 1994).

from more in-depth case studies, will be very helpful to further our understanding on this topic.

On the whole, findings from this paper will help to answer specific questions concerning the relationship between training opportunities for core employees and firm internal labor markets, the use of flexible staffing practices, and the adoption of High Performance Work Systems. In a broader context, it also sheds light on how the diverse changes in the workplaces really affect workers in terms of the skill-upgrading opportunities available to them.

CHAPTER 2

A REVIEW OF THE LITERATURE

TRAINING: THEORETICAL BACKGROUND AND RELATED RESEARCH

In organizational studies and labor relations, the importance of training has always been noted (Knoke and Kalleberg, 1996). At the individual level, the acquisition of training helps to promote literacy, technical proficiency, and inter-personal skills, which directly leads to better performance at work and higher rewards. Training can also be an asset, or under some circumstances a prerequisite, for a person's upward mobility. As Sonnenfeld (1985) has noted, training has been increasingly incorporated into strategic human resources management as a prelude for promotion. At the organizational level, training is a subtle yet effective way of imparting firm culture and instituting work norms. More important, it is intended to equip or update workers with the various skills that enable organizations to achieve higher efficiency and the maximization of firm profits in the short or long run. In light of the profound changes that have swept the workplace since the 1970s, job training has assumed yet another vital function as an essential means to cope with changes fostered by technological innovation, market competition, organizational restructuring, and demographic shifts (Knoke and Kalleberg, 1994).

Baron and Bielby's (1980) insightful observation "bringing firms back in" articulates the importance of organizational-level factors on worker and organization's outcomes. With regard to training, previous research has identified several important factors in explaining where training is likely to occur. Starting from the widely perceived positive association between the organizational size and the training activity, research has

evolved to a full-scale exploration of some more subtle factors that determine the provision of training (Mincer, 1983; Freeman and Medoff, 1984; Barron, Black, and Lowenstein 1987; Barron, Black, and Lowenstein, 1989; Knoke and Kalleberg, 1994; Knoke and Ishio, 1994).[8] These factors include firms' contextual environment (market competition) and structural composites (gender/race composition, union power, firm formalization), and they constitute firms' basic characteristics in my analysis.

FIRM INTERNAL LABOR MARKETS AND TRAINING OF CORE WORKERS

From a structural perspective, the most important factor shaping the provision of training is the presence of Firm Internal Labor Markets. FILMs refer to any cluster of jobs that features an upward directed job ladder, associated with "a progressive development of knowledge and skill" (Althauser and Kalleberg, 1981, p.130). With the erection of elaborate job ladders, firms hire inexperienced workers and management trainees into entry-level positions and train them to build up required skills for the next level positions. Upward mobility provides a continuous flow of employees to vacancies that carry heavier responsibilities and higher compensation within the firm (Osterman, 1984).

In a more expansive conception of FILM, job classification and rules governing employment (job security, labor deployment) are regarded as important features of internal labor markets as well (Osterman, 1994). Such organizational characteristics are termed firm formalization. The codification of tasks and classification of jobs define explicitly the rights and duties of positions ranging from simple to elaborate (Knoke and Kalleberg, 1994). And with specific requirements stipulated for definite job positions, formalization generates obligations for firms to assist new and current employees in attaining greater job proficiency through formal training programs (Knoke and Kalleberg, 1994). Also tied in with higher level of formalization are greater chances of

[8] For a comprehensive overview of the effects of these pertaining factors on training, see Knoke and Kalleberg, 1994.

institutionalization of training practices (Powell and DiMaggio, 1991). The establishment of training norms at the organizational level is likely to enhance firms' training efforts.

A considerable body of empirical evidence supports the notion. For instance, Pfeffer and Cohen (1984) report a positive correlation between internal labor markets and firm training in practice. Knoke and Ishio's (1994) study of the 1991 National Organizations Survey (Wave I) data also indicates that the more extensive an organization's internal labor market, the more likely it is to use formal training programs as mechanisms for enabling workers to advance to positions of higher prestige, pay and responsibility. The proposition is further strengthened with findings of strong associations between FILMs and five company training measures (Knoke and Kalleberg, 1994).[9]

But not all researchers have reached the same conclusion that FILMs positively affect training. Especially noteworthy is the emerging view that the effect of FILMs is on the decline (Cappelli, 1995; Osterman, 2000). Popular accounts with the theme of changing employment relationship abound, portraying firms as seeking to reduce job security and commitment to incumbent employees. Little empirical evidence has backed up the observation though, with the exception of Osterman's (1995) recent study on transformed organizations, which concludes that internal labor markets do not seem to be affecting training.

However, even Osterman, who proposes the erosion of FILMs, acknowledges that internal labor markets remain important albeit with some deterioration (Osterman, 1994). Research has found that aggregate indicators of the vigor of FILMs have changed

[9] The five measures of training include: whether any formal training program exists, percentage of workers trained in establishment, the size of training budget, the per-employee and per-trainee expenses (Knoke and Kalleberg, 1994).

relatively little (Bernhardt and Marcotte, 2000). It is of great interest of this study to see whether FILMs retain the influence on firms' provision of training.

Therefore, I hypothesize that:

H_1: Establishments with formalized internal structures are more likely to provide formal training to core employees than those with less formalized structures.[10]

H_2: Establishments with more established Firm Internal Labor Markets (FILMs) are more likely to provide formal training to core employees than are those with less differentiated FILMs.

For several decades after World War II, the combined features of stable and continuous output of product and favorable international conditions enabled U.S. companies to remain in the lead in world markets (Smith, 1997). But between 1965 and 1988, the U.S. share of world economy plunged dramatically, from 39.9% of total gross domestic product to 28.5% (World Bank 1990, p. 183). Global economic changes[11] increased competition and uncertainty among firms. Pressure amounted for firms to push for greater profits and to become more flexible both in contracting with employees and in responding to consumers (Kalleberg, 2000). Thus, the very basis of the original firm internal structure, which is premised on planning and predictability, was undermined by the requirement that firms be flexible and cost conscious. As Atkinson (1985) has observed, experimenting with unorthodox formations of labor deployment by employers marks a significant break from "the conventional, unitary and hierarchical internal labor markets that dominate the manpower management both in theory and in practice" (p. 14). These innovations, adopted to secure greater flexibility from the workforce, emphasize firms' responsiveness to the level of economic activity (numerical flexibility) and to the

[10] As the definition of core employees refers to those who are involved in activities of producing the main product or providing the main service of the company, I expect that core workers are the primary participants of the internal labor market.

[11] For a comprehensive overview of the changes that have occurred in the work place, see National Research Council's book "*The Changing Nature of Work: Implications for Occupational Analysis"*.

nature of that activity (functional flexibility) (Atkinson, 1985). In accordance, flexible staffing practices and High Performance Work Systems have been widely implemented in the workplace.

FLEXIBLE STAFFING PRACTICE AND TRAINING OF CORE WORKERS

In contrast to the standard full-time regular employment, the rise of the nonstandard employment is often cited as evidence of the changing employment relationship and the decline of firm internal labor markets. On the part of the organization, such a trend is reflected in the use of flexible staffing practices. Recent studies have offered a working definition of flexible work that captures the variety of such atypical employment, ranging from part-time,[12] oncall,[13] directly hired individual temps, and individuals hired via intermediaries including temporary help agencies and contract companies (Kalleberg and Reynolds, 2000). As suggested by the National Current Employment Statistics Survey, an increasing portion of American workers are now employed in nonstandard work arrangement, and overall, nearly one third of the workers fall in this category (Hudson, 2001).[14]

Why do firms adopt flexible staffing practices? The topic has inspired much discussion as well as debate. For the organization at one point in time, it would be ideal if the number of employees matches exactly the number needed. And to a certain extent, flexible staffing allows the headcount to be quickly and easily increased or decreased in line with even short-term changes in labor demand (Atkinson, 1985). In the past two decades, competitive markets and the volatile external environment have stimulated firms

[12] Part-time work is usually defined as regular wage employment in which the hours of work are less than 35 hours per week.

[13] On-call workers are temporary employees who don't have regularly scheduled work but are only called to work as needed, for example, substitute teachers.

[14] It is worth noting that Hudson's definition includes the self-employed in the non-standard arrangement, which alone takes up more than 25% of the nonstandard workforce. According to his study, contingent workers constitute more than 8% of the workforce (Hudson, 2001).

to adopt flexible staffing schemes to offset uncertainties and risks. A pool of contingent workers are created as a buffer zone around core employees, expanded or reduced according to the company's needs. As Appelbaum (1992) has commented, "the ratios between full-time and part-time jobs shifted as a result of explicit employer strategies to subcontract work and redesign jobs to be carried out by part-time and temporary workers" (p. 7).

This continual restructuring of corporate operations is perceived to have an impact on training. As businesses increase their use of contingent workers,[15] more and more employees become potentially fluctuating personnel in the organizations' view. These contingent workers may not remain long enough for companies to recover their full training investments through upgraded productivity. Thus, employers are likely to find little incentive to train those with no long-term relationship to the firm (Knoke, 1994).[16] In addition, the attitude that employees represent another cost of doing business is a strong driving force for firms to cut the human costs by replacing permanent employees with contingent workers, an alternative labor source much more economical to the organization. Although direct evidence leading to a causal argument is not in place yet, some studies do have findings suggestive of such a connection. For instance, an examination of the use of part-time employment across industries reports a higher proportion of part-time employment in industries with lower levels of benefits (Smith,

[15] Contingent work is defined by Polivka and Nardone (1989) as "any job in which an individual does not have an explicit or implicit contract for long-term employment and one in which the minimum hours worked can vary in a non-systematic manner" (p. 11). A more brief definition provided by Hudson (2001) refers to contingent work as jobs that are of limited or uncertain duration.

[16] The BLS step95 study found establishments that offer more generous benefits are more likely to provide formal training and employees working in establishments with these characteristics are more likely to receive training. The study suggests that the use of benefits can be an indicator of firm's commitment to maintain a long-term employment relationship (Frazis, Gittleman and Joyce, 2000).

1997). If this were true, training would definitely represent a source of cost to avoid for organizations.

The theory suggests that flexible staffing dims the training prospects for contingent workers. But whether the situation holds true for core employees remains to be seen. Two possible responses imply different predictions. One takes the adoption of flexible staffing as an indicator of an employer's intention to reduce human costs, hence a lack of will to invest further in training. An alternative view appeals to the functioning of the core-peripheral distinction and argues that flexible staffing may in fact reflect a strategy of firms' relying on outside employees to protect the core from fluctuations in workloads (Smith, 1997; Abraham and Taylor, 1996). It is possible that firms with contingent employment actually provide a substantial amount of training to core employees. While not many empirical studies have directly tested the effect of contingent employment on core employee training, the 1995 Survey of Employer-Provided Training (BLS) does find that the presence of contract workers is positively related to the receipt of formal training by employees within organizations (Frazis, Gittleman, Horrigan and Joyce, 1998; Frazis, Gittleman and Joyce, 2000).

Given the information on flexible staffing practice, I conduct an examination of three staffing practices in particular, namely the use of part-timers (in core positions), the use of oncall workers, and the use of temps (in full-time employment). Therefore, in regard with core employee's training opportunity, I hypothesize that:

H_3: Establishments that use more part-timers in their core positions provide more training to core workers.

H_4: Establishments that use oncall workers provide more training to core workers.

H_5: Establishments that use temporary workers in full-time employment provide more training to core workers.

HIGH PERFORMANCE WORK SYSTEMS AND TRAINING OF CORE WORKERS

Parallel to numerical flexibility, functional flexibility refers to organizations' ability to re-deploy employees quickly and smoothly between activities and tasks (Atkinson, 1985). In the work setting, the concept is translated into a new rapidly developing work organization, the High Performance Work Systems. A 1992 survey reports that about 35% of private sector establishments with over 50 employees have made substantial use of high performance work systems (Osterman, 1994).

As an alternative to the traditional hierarchical organization associated with mass production and scientific management, High Performance Work Systems are expected to represent a fundamentally different approach to management (Tomer, 2001). The ideal HPWS portrays firms as attempting to provide workers with the information, skills, incentives, and responsibility to make decisions crucial for innovation, quality improvement, and rapid response to change (Kling, 1995). Among the essential characteristics identified in HPWS, job enrichment and job rotation are listed as key dimensions of the innovative form of work organization (Pfeffer, 1998). As the new model calls for an expansion of job roles and a blurring of occupational distinctions, the increasing skill demand might generate a real and pressing need for training within organizations.

But what we must realize is that HPWS does not automatically guarantee training. For instance, it is noted that training and selection can supplement each other in meeting the skill demands of organizations (Appelbaum, Bailey, Berg and Kalleberg, 2000). Firms can choose to apply more selective screening rather than provide more training.

There is evidence that some firms employ a number of the innovative practices without formally providing their workers with additional skills (Lawler, 1992). Most popular accounts from a managerial perspective have treated HPWS in a positive light, taking better training opportunities for employees as a given rather than as a hypothesis to be tested. But this view of HPWS might be an overstatement of the degree of innovation and change actually taking place (Appelbaum and Batt, 1994). Before we come to use training as a benchmark of HPWS, we need to address the issue of whether HPWS brings about more training, in reality rather than in rhetoric.

The previous research is generally of the view that HPWS have a positive effect on the provision of training to core employees.[17] Firms with HPWS are noted to invest heavily in training, with an estimated amount of at least 5% of payroll and 15% or more in self-directed team-based systems (Appelbaum and Batt, 1994). And most empirical findings seem to support the assertion (Frazis, 1998; Frazis and Herz, 1995; Osterman, 1995). One study shows that both the hours of training and the dollar amount spent on training tend to be positively related to HPWS practices (Frazis, Gittlement and Joyce, 2000). However, a methodological concern has been raised in the definition and operationalization of the concept of the HPWS. Although there is not much debate on the broad set of characteristics associated with HPWS, exactly how to determine whether an organization is qualified for a "transformed" firm with different combinations of these characteristics is not easy. For instance, a 1990 study finds that 70% of the 476 surveyed large companies have installed the most common form of participation, quality circles,

[17] Some of the research cited here studied training of all employees within the organization. But that should not change our conclusion, since it will only be a more conservative measure of the effect of HPWS on core employees.

but only 10% have high involvement with 3 or more practices and more than 40% of workers covered by each (Dulworth, Landen and Usilaner, 1990). It is quite clear that which measure we use will drastically change our conclusion about the prevalence of HPWS.

The emerging literature on HPWS has become more in favor of a systematic approach towards HPWS. As Kalleberg (1997) has argued, "HPWS characteristics should be examined simultaneously rather than separately" (p. 119). Other researchers have also emphasized that the benefits of HPWS are contingent on a system of human resource practices (Levine and Tyson, 1990; Bailey, 1992; Appelbaum and Batt, 1994; Kalleberg and Moody, 1994). The conventional method of measuring HPWS uses the aggregate counts of certain innovative practices as an indicator of whether a firm is transformed. For instance, several of the BLS studies report that the number of innovative practices is positively correlated with training in organizations (Frazis, Gittlemen, Horrigan and Joyce, 1998; Frazis and Herz, 1995; Frazis, Gittlemen and Joyce, 2000). Such an approach, however, is problematic and might fail to capture whether the change is systematic.

A new framework of HPWS proposes that three basic components are required for HPWS to be effective (Bailey, 1993; Appelbaum, Bailey, Berg and Kalleberg, 2000). The three elements include, "opportunity for substantive participation in decisions, appropriate incentives, and training and selection policies that guarantee an appropriately skilled workforce" (Appelbaum, Bailey, Berg and Kalleberg, 2000, p. 39). Conceptually, these characteristics fall along three dimensions of HPWS, namely, the Discretion Dimension, Incentive Dimension and Skill Dimension. The Discretion Dimension

stresses the importance of decentralization in decision-making and encourages employee involvement in constantly improving firm performance. Practices that empower workers with responsibility, authority and opportunity to solve problems and make decisions fall into this category. The Incentive Dimension is crucial in properly motivating employees and eliciting their efforts. Practices in this regard emphasize group reward to promote product quality and firm performance with a more committed workforce. Countering the de-skilling trend as seen in automation and job simplification, the Skill Dimension underscores job enrichment as a means to empower workers. Thus, participants in HPWS usually need better skill and knowledge across a broad range.

As past research has all started from the assumption that different dimensions of HPWS do not have different bearings on training, no efforts have been made to test the independent effects of these dimensions of HPWS characteristics. Here, instead of taking HPWS as an undifferentiated whole, I explore the dimensions of HPWS characteristics in relation to the provision of training. I hypothesize that:

H_6: Establishments with the Discretion Dimension of HPWS characteristics provide more training to core employees.

H_7: Establishments with the Incentive Dimension of HPWS characteristics provide more training to core employees.

H_8: Establishments with the Skill Dimension of HPWS characteristics provide more training to core employees.

CHAPTER 3

DATA AND MEASUREMENTS

This paper uses the data from 1996-1997 National Organizations Survey (NOS Wave II) to investigate employer-provided training programs. Funded by the National Science Foundation, NOS II consists of data on 1,003 United States work establishments,[18] using a stratified random sampling method in selecting cases from approximately 15 million work establishments in Dun and Bradstreet's Information Services data file. The stratification is employed to create adequate samples within size categories, and appropriate weights are attached to create a representative sample of all establishments in the U.S..

Compared with previous collection of data, NOS II data enjoys great merits in several significant ways. First, the data set includes establishments of all size in the sample, which for the first time allows researchers to incorporate small establishments in their study. As over half (54.7%) of the work organizations in the United States have fewer than four employees (Kalleberg and Reynolds, 2000), it is very important that we should obtain some understanding on this particular group to be able to present an accurate picture of training practices nationwide. Second, the data set contains fairly rich information on firms' human resources practices and work organization in general, and variables range widely from staffing methods, internal job ladders, promotion chains to information about job training programs, the use of contingent employees and high

[18] Osterman commented on the relative advantage of surveying establishments as opposed to organizations. And the reason he gave is that respondent in establishment is more likely to know the facts, or policies in actual practice (Osterman, 1994). According to the BLS, an establishment is defined as "an economic unit which produces goods or services. It is usually at a single physical location and is engaged predominantly in one type of economic activity" (BLS, 1996).

performance work organization, etc.. All the information is gathered at the establishment level and the establishment is the unit of analysis. The third merit is that questions on formal training are directed towards core workers exclusively, avoiding a potential measurement error of mixing up core and non-core employee training. These merits of the data collection position me well in addressing issues of interest to my study.

DEPENDENT VARIABLES

To gauge the extent to which firms provide formal training[19] to core employees, I construct the dependent variable measuring the percentage of core employees engaged in formal training programs within establishments. To compute the dependent variable, several steps are taken. First, the NOS informant is asked, "in the past two years, did organization provide any core occupants with formal job training?" Answers to the question are coded 1 for yes and 0 for no, indicating the presence or absence of a formal training program within establishment. Second, the informant is asked, "about how many of the core occupants were involved in all formal training activities in the past two years?" The answer is either a percentage or an absolute number. Organizations without formal training programs were re-coded as 0 on this item.[20] The percentage is kept unchanged and the number is recounted into percentage by dividing it by the total number of core employees.[21] Cases with missing values on the dependent variable (including the calculation of the dependent variable) or with values higher than 100% are dropped from the analysis.[22] In addition, instead of replacing missing values on the independent

[19] Formal training is defined by the BLS report as training that is planned in advance and that has a structured format and a defined curriculum. Formal training may be conducted by supervisors, company training centers, businesses, schools, associations, or others; and it can include classroom work, seminars, lectures, workshops, and audio-visual presentations.

[20] Organizations with no formal training programs were listed as missing values in the original data. Recoding them into 0 on the second measure is reasonable in that we can say that in organizations with no formal training programs, actually 0% of their core employees participate in firm-provided formal training.

[21] The result is then timed by 100% to yield the actual percentage.

[22] Cases with a value higher than 100 percent on "percent of core employees in formal training" could be due to the high fluctuation in firm size (turn over effect), or simply error in report. As these cases might cause undue skew in the sample distribution and the interpretation is very difficult to make, they are excluded from the analysis. All together 14 cases are dropped for this reason.

variables with their mean, the current study uses the listwise selection. As unaware of the general feature of missing values, the mean-replacing approach might under-represent or even distort the variation in the independent variables. This leaves us with a total number of 452 cases. Comparing the frequency distribution of all major independent variables of the selected cases with the entire sample, no indication of any selection bias is found. And in terms of the percentage of organizations that provide formal training programs among the selected cases and among the entire representative sample, the difference is minimal, i.e., 57.9% vs. 59.3%.

INDEPENDENT VARIABLES

Table 3-1 presents the detailed definition and coding method of all variables included in the analysis and Table 3-2 presents both the weighted (by establishment size) and unweighted descriptive statistics. The weighted correlations between variables are shown in Table 3-3, together with the significant levels associated with the correlations. The measurements of major independent variables are discussed below.

Organizational Size

As the sampling design is stratified by size, cases included in the final analysis contain a relatively large proportion of mid-sized and large establishments. Using the Bureau of Labor Statistics size categorization for establishments (Frazis, Gittleman, Horrigan and Joyce, 1998), cases are broken down as follows: 30.3% of the establishments have fewer than 20 employees, 16.7% with 21-50 employees, 11.4% 51-100 employees, 22.5% 101-500 employees, and 19.1% with over 500 employees. Because size is highly positively skewed, it has been transformed into the corresponding log 10 form when entered into the regression models. Each case is assigned a weight according to its establishment size and the possibility it will be selected in a truly

representative sample. Thus, large establishments are adjusted (discounted) for their effects in the sample.[23]

Table 3-1 Definition and Coding Method for Variables

	Definition	Coding Method
Pct Training	Percent Core Employees in firm-provided Formal Training	Continuous; pct train = (N of trained core/ total core)*100%
Log Size	Log value of the total number of full time and part time employees	Continuous; log size= log (full-time + part-time).
Org Type	profit or non-profit organization	non-profit=1; profit =0.
Pct Female	Female as a percentage of all full-time employees	Continuous; pct female=(N of fe. full-time/ full-time)*100%.
Pct White	White as a percentage of all full-time employees	Continuous; pctwhite=(N of white full-time/ full-time)*100%.
Unionization	Percent of employees in Union	Continuous; unionization =(N of union workers/ size)*100%.
Comp1 (domestic)	Level of Domestic Competition in the main market	Scale from 1 to 4; Very Much=4, Moderate=3; Little=2; None=1.
Comp2 (foreign)	Level of Foreign Competition in the main market	Scale from 1 to 4; Very Much=4, Moderate=3; Little=2; None=1.
Formalization	Existence of a number of types of written documentation (procedures, job descriptions, performance records, contracts, evaluation, hiring/firing, safety/fringe benefits).	Scale from 0 to 6; 6 very formalized structure and 0 very informal. Reliability=.8156.
FILM	Existence of ILM (including possibility of core employee promotion and how often it happens).	Scale from 1 to 4; 4 very entrenched and 0 non-entrenched. Reliability=.8026.
Part-time	Percent of part-time employees in core positions	Continuous; pct part-time=(N of part-time core/ total core)*100%.
Oncall (yes/no)	Presence/Absence of oncall worker use	Presence=1; Absence=0.
Temp	Presence/Absence of temp worker in full-time employment	Presence=1; Absence=0.
Hpws1: discretion	Discretion dimension of HPWS (quality control meeting and problem-solving group).	Scale from 0 to 2; 2 much discretion and 0 non-discretion.
Hpws2: incentive	Incentive dimension of HPWS (group incentive and profit sharing).	Scale from 0 to 2; 2 much incentive and 0 non-incentive.
Hpws3: skill	Skill dimension of HPWS (including job rotation, cross training and paid learning).	Scale from 0 to 3; 3 much skill and 0 non-skill.

[23] Comparing the unweighted and weighted means for variable log size, we see a value of 1.8500 vs. 0.8444, respectively. The fact that training is more prevalent in large establishments is also indirectly reflected in the decrease of the value of dependent variable (percent of core employees receiving formal training) from 38.3778% to 17.8256%.

Table 3-2 Weighted and Unweighted Descriptive Statistics: 452 Establishments from NOS II data, 1996-1997

	Weighted Statistics		Unweighted Statistics	
	Mean	Std. Dev.	Mean	Std. Dev.
Dep. Variable				
Pct Training	17.8256	8.69911	38.3778	42.64729
Org. Features				
Log Size	.8444	.17687	1.8500	.95974
Org Type	.8702	.08806	.7403	.43892
Pct Female	43.2014	9.35972	46.7122	28.51057
Pct White	87.4575	6.47904	76.7452	27.10087
Unionization	2.2374	3.18280	11.8114	26.69154
Comp1 (domestic)	3.3209	.22171	3.3069	.91242
Comp2 (foreign)	1.4562	.19678	1.7468	.99474
FILMS				
Formalization	2.0582	.54500	3.9013	1.98134
FILM	1.8840	.27131	2.7114	1.03688
Flexible Staffing				
Part-time	11.7034	5.96318	14.8146	24.38179
Oncall (yes/no)	.1703	.09851	.2253	.41824
Temp	.0664	.06523	.1674	.37372
HPWS				
Hpws1: discretion	.7415	.19968	1.0236	.74882
Hpws2: incentive	1.3848	.23166	1.5451	.94988
Hpws3: skill	.4651	.16429	.5751	.68763
Number of Cases	452	452	452	452

Table 3-3 Correlation Table (Weighted by Establishment Size)

Panel A: Weighted Correlation

	pcttrain	logsize	profit	pctfeft	pctwft	union	comp1	comp2	formal	film	ptcore	oncall	temp	hpws1	hpws2	hpws3
pcttrain	1.000	.298	-.023	.102	-.136	.017	-.024	.030	.363	.352	.153	.164	.100	.155	.206	.298
logsize	.298	1.000	-.184	.037	-.397	.153	.095	.130	.406	.449	.140	.085	.286	.377	.089	.339
profit	-.023	-.184	1.000	-.001	.148	-.123	.243	.129	-.255	.038	-.044	-.121	-.091	-.094	.018	.188
pctfeft	.102	.037	-.001	1.000	-.067	-.077	.018	-.040	.112	.007	.300	-.004	-.036	-.089	.116	.021
pctwft	-.136	-.397	.148	-.067	1.000	-.018	-.105	-.127	-.223	-.182	-.149	-.077	-.011	-.174	-.062	.032
union	.017	.153	-.123	-.077	-.018	1.000	-.178	.001	.068	.107	-.042	.120	.188	-.019	-.074	-.054
comp1	-.024	.095	.243	.018	-.105	-.178	1.000	.217	.004	.189	.023	-.083	-.043	.181	.115	.192
comp2	.030	.130	.129	-.040	-.127	.001	.217	1.000	.058	.113	-.024	-.039	.054	.129	.108	.111
formal	.363	.406	-.255	.112	-.223	.068	.004	.058	1.000	.391	.208	.083	.035	.276	.111	.255
film	.352	.449	.038	.007	-.182	.107	.189	.113	.391	1.000	.174	.001	.246	.360	.247	.371
ptcore	.153	.140	-.044	.300	-.149	-.042	.023	-.024	.208	.174	1.000	.093	-.101	.063	.124	.032
oncall	.164	.085	-.121	-.004	-.077	.120	-.083	-.039	.083	.001	.093	1.000	-.058	.107	.041	.057
temp	.100	.286	-.091	-.036	-.011	.188	-.043	.054	.035	.246	-.101	-.058	1.000	.078	.111	.216
hpws1	.155	.377	-.094	-.089	-.174	-.019	.181	.129	.276	.360	.063	.107	.078	1.000	.302	.281
hpws2	.206	.089	.018	.116	-.062	-.074	.115	.108	.111	.247	.124	.041	.111	.302	1.000	.192
hpws3	.298	.339	.188	.021	.032	-.054	.192	.111	.255	.371	.032	.057	.216	.281	.192	1.000

Panel B: One-Tail Significant Level

pcttrain	.	.000	.312	.015	.002	.358	.306	.262	.000	.000	.001	.000	.017	.000	.000	.000
logsize	.000	.	.000	.215	.000	.001	.021	.003	.000	.000	.001	.035	.000	.000	.029	.000
profit	.312	.000	.	.492	.001	.004	.000	.003	.000	.211	.177	.005	.027	.023	.353	.000
pctfeft	.015	.215	.492	.	.078	.051	.348	.198	.008	.439	.000	.465	.224	.029	.007	.331
pctwft	.002	.000	.001	.078	.	.354	.013	.003	.000	.000	.001	.052	.406	.000	.093	.246
union	.358	.001	.004	.051	.354	.	.000	.488	.075	.011	.187	.005	.000	.347	.059	.127
comp1	.306	.021	.000	.348	.013	.000	.	.000	.462	.000	.316	.039	.179	.000	.007	.000
comp2	.262	.003	.003	.198	.003	.488	.000	.	.111	.008	.308	.202	.126	.003	.011	.009
formal	.000	.000	.000	.008	.000	.075	.462	.111	.	.000	.000	.039	.231	.000	.009	.000
film	.000	.000	.211	.439	.000	.011	.000	.008	.000	.	.000	.488	.000	.000	.000	.000
ptcore	.001	.001	.177	.000	.001	.187	.316	.308	.000	.000	.	.024	.016	.090	.004	.246
oncall	.000	.035	.005	.465	.052	.005	.039	.202	.039	.488	.024	.	.111	.012	.190	.113
temp	.017	.000	.027	.224	.406	.000	.179	.126	.231	.000	.016	.111	.	.049	.009	.000
hpws1	.000	.000	.023	.029	.000	.347	.000	.003	.000	.000	.090	.012	.049	.	.000	.000
hpws2	.000	.029	.353	.007	.093	.059	.007	.011	.009	.000	.004	.190	.009	.000	.	.000
hpws3	.000	.000	.000	.331	.246	.127	.000	.009	.000	.000	.246	.113	.000	.000	.000	.

The highly significant correlation (See Table 3-3) between training and the log of establishment size in the weighted sample indicates a clearly positive relationship between firm size and training, which is generally consistent with previous findings.[24]

Formalization

Formalization is measured with a scale consisting of six items, including whether formal written documents exist on dispute resolution, job descriptions, job performance, personnel evaluations, hire/fire procedures and labor contract.[25] Each item receives a value of 0 or 1, depending upon the absence or presence of the practice of concern. Factor analysis of the six items shows that only one major component is extracted (with an Eigen value of 3.229), which explains 53.824% of the variation. A scale is then computed from the sum of the six numbers. The scale for formalization ranges from 0 to 6 and reports a reliability level of .8156.

The weighted correlation (See Table 3-3) between formalization and training shows a positive value that is highly significant. This provides some tentative support to my first hypothesis that higher level of formalization is associated with more training for core employees.

FILM

The variable FILM denotes the sense whether an internal career ladder exists within an establishment. In current study, the concept is operationalized with measuring the extent to which establishments promote core employees to higher positions. Two items are used to construct the scale. The first item, "possibility of core employees to be

[24] The body of literature that has explored the relationship between size and training is well established (See, for instance, Barron, Black and Lowenstein, 1987). Of recent, the BLS study reported that employees in smaller establishments were less likely to have received formal training than those in larger ones. At the individual level, about 62% of those in small establishments (ranging from 50 to 100 employees) received formal training in the last 12 months, versus 73% of those in establishments with 100-499 employees and 71% in establishments with 500 or more employees. (Frazis, Gittleman, Horrigan and Joyce, 1998).

[25] The scale measurement was first designed by Kalleberg and Knoke. For details, see Kalleberg and Knoke, 1997.

promoted above" shows whether it is possible for core employees to move up the career ladder. The second item, "how often core workers are promoted above", measures the frequency of such promotion. To match the level of the second component, which ranges from 1 "never" to 4 "very often", the answer to the first component is recoded as 1 for "no" and 4 for "yes". The correlation between the two items is .703 and the factor analysis yields only one major component, which accounts for 85.163% of the variation of the underlying concept (with an Eigen value of 1.703). And the value for the variable FILM is calculated by locating the mean on the two items for each case (ranging from 1 to 4). The alpha coefficient is .8026. Similar with the case of formalization, the correlation matrix suggests a positive association between FILM and core employee training.

Part-time

The first flexible staffing practice examined here is the use of part-time employment. The variable part-time measures the percentage of part-time employees in an establishment's core positions. Note that the question is originally asked in the survey about the number or percentage of full-time employees in core workers. Thus, the most accurate presentation of the variable should be the percentage of non- full-time employees in core positions.

The variable is computed in two steps. First, information is obtained on the number (or percentage) of employees engaged in core product or service who are employed full-time. Then the percentage is kept unchanged and the number is divided by the total number of core employees to get converted into percentage. Such a computation formula implies that some non-standard forms of employment, as long as they are in full-time status, will not fall into this category. Examples may include full-time directly/indirectly hired temps and full-time directly/indirectly hired contractors.

Similarly, regular part-time employees, conceptually not necessarily as contingent as workers in some other forms of nonstandard employment, fit into this classification.

The weighted data shows a significant positive association between part-time and training. But we should take note of the possible restricted variance in data. The cases tend to cluster on the low extreme of the value, with over half (59%) of the establishments having 0% part-timers in the core employment.[26]

Oncall

The second flexible staffing practice examined in this study is the use of oncall workers. Oncall workers are temporary employees of establishments (or larger organizations) who don't have regularly scheduled work and are only called to work as needed. Oncall workers usually work within the establishment, receive payment from the establishment and work under the direction of the establishment. But the great uncertainty associated with their work schedule sets them apart from the ordinary temp workers. A dichotomous variable is constructed to reflect firms' practice of using oncall workers. The variable is coded 0 for the absence of oncall practice and 1 for the presence. The unweighted data shows that roughly one fourth of the establishments use oncall workers as a flexible staffing practice.

Temporary Employment

The third flexible staffing practice looks at temporary employment within full-time employees. The survey question asks if any of the full-time employees of the establishment are temporary workers. A dichotomous variable is created, 0 denoting no temps among full-time workers and 1 denoting some temps in full-time workers.

[26] Checking the data frequency distribution, we can see that within the unweighted sample, 68.8% of the establishments use less than 10% part-time workers in their core positions and a predominant majority of establishments (89.7%) use less than 50% of part-time in core positions.

This construction of temporary employment includes only a fraction of the temporary workers, namely full-time temps. They can either be directly hired by the establishment but work for only a limited period of time; or they may work at the establishment but work for (get paid from) temp help agencies.

HPWS

The conventional method of measuring HPWS, as mentioned briefly in the literature review part, uses the aggregate counts of innovative practices as an indicator of whether a firm is transformed or not. The series of BLS studies generally adopt this approach by generating a list of innovative practices[27] associated with HPWS first and then entering the number of practices into the model to predict training level. However, such technique is prone to criticism for ignoring the systematic effect of HPWS practices.

Starting with seven innovative practices widely recognized to be associated with HPWS (quality control meeting, problem solving group, job rotation, cross training, paid learning, group incentive, and profit sharing),[28] I use factor analysis to explore the limitation of the conventional approach in capturing the central idea of a system of HPWS practices. Conceptually, if the seven variables were capturing the same underlying idea (the HPWS concept), they should load well on the factor analysis and should yield a high alpha score. But the alpha level for the reliability scale reports only .4747. And the factor analysis seems to lend strong support to the alternative component-assertion about HPWS. Three components (with Eigen value exceeding 1) are extracted, pointing to three

[27] The list of establishment workplace practices as examined by the BLS studies include: pay increases directly linked to mastering new skills, employee involvement in technology and equipment decisions, job redesign or reengineering, job rotation, just-in-time inventories, co-worker review of employee performance, quality circles, total quality management, and self-directed work teams (BLS, 1996).

[28] Alternatively, five workplace practices in relation to core employees are used by Osterman (1995) to gauge HPWS, which include self-directed work teams, job rotation, employee problem-solving groups, statistical process control, and total quality management.

distinct underlying clusters. The major component ends up explaining 24.56% of the variance, the second an additional 17.26%, and the third 15.71%. Altogether, the three major components account for 57.53% of the variation.

It is worth noting that the loading result of the seven items is quite consistent with the three dimensions of HPWS practices identified in the literature (Appelbaum, Bailey, Berg and Kalleberg, 2000). The first component matches the Skill Dimension of HPWS and consists of three variables, job rotation, cross training and paid learning. The second component is linked to the Incentive Dimension of HPWS and includes two variables, group incentive and profit sharing. The last two variables that load on the third major component, quality control meeting and problem-solving group, are mapped in the Discretion Dimension of HPWS. The preliminary analysis opened the possibility to examine and test the independent effects of these different dimensions of HPWS characteristics on training. As past research has all shared the assumption that HPWS practices do not differ in their implication for training, no efforts have been made to differentiate the effect of the individual dimension or practice. By disaggregating the concept, I hope to see whether different components of HPWS characteristics might in fact have different bearings on the provision of training.

Each of the seven items receives a value of 0 denoting the absence of the practice and a value of 1 for the presence. Three variables are computed, measuring the discretion, skill, and incentive dimension of HPWS characteristics. Discretion is composed of quality control meeting and problem-solving group, and ranges from 0 to 2. Skill is composed of job rotation, cross training and paid learning, and ranges from 0 to 3. Finally, incentive is composed of group incentive and profit sharing, and ranges from 0 to 2. A double check of factor analysis has been run on each of the composite variable. The

result shows that in all three cases, only one major factor has been extracted (with Eigen value all exceeding 1).[29] The overall weighted correlation suggests a significant positive relation between core training and these dimensions of HPWS practices.

Control Variables

Organizational characteristics that have been identified by previous literature to impact on training are entered as control variables. These variables include organization type (profit/non-profit), composition (race and gender), unionization, and external environment (domestic and foreign competition). Detailed information about the definition and coding of these variables can be found in Table 3-1 and Table 3-2.

[29] For the discretion variable, the major component captures 62.365% of the variation in the underlying concept measured with an Eigen value of 1.247. For the skill variable, the major component captures 47.677% of the variation in the underlying concept measured with an Eigen value of 1.43. For the discretion variable, the major component captures 62.796% of the variation in the underlying concept measured with an Eigen value of 1.256.

CHAPTER 4

DATA ANALYSIS AND RESULTS

This section utilizes the statistical technique of OLS regression to examine hypotheses outlined earlier in the paper with regard to the prediction of training opportunities for core employees. As establishments are sampled with probability proportional to their size (stratified sampling by size), the regression analysis has adopted the weighted option. A weight variable is attached to each case, and the value depends upon the establishment's size,[30] ranging from .4 for very small establishments to .00004 for very large establishments. Consequently, interpretations of the findings should reflect attributes of establishments in the U.S.. For instance, the weighted mean for the dependent variable, percent of core employees in training, suggests that on average 17.83% core workers are engaged in training, as is true for the representative U.S. establishments.[31] Table 3-2 presents both the weighted and unweighted statistics for the variables included in the analysis.[32]

Prior to the regression analysis of training, the bivariate correlations (weighted) as seen in Table 3-3 offer preliminary evidence in support of most of the hypotheses

[30] Establishment size is defined as the total number of full-time and part-time employees.
[31] The unweighted mean for the Dependent Variable should be interpreted differently. It suggests that on average 38.3778% core workers participate in formal training, as experienced by the representative U.S. labor force.
[32] By assigning a smaller weight to large establishments, the weighted option discounts the influence of large establishments in the sample. This can be seen from the change in the mean value for variable "logsize": the unweighted mean reports 1.8500 whereas the weighted mean is reduced to .8444. We would thus expect that the weighted measures should show decreased mean values for variables that are positively correlated with establishment size, such as percent core employee training (dependent variable) as the example in the text, or formalization (mean value changes from 3.9013 to 2.0582) and film (mean value changes from 2.7114 to 1.8440).

proposed. Indeed, all of the variables of my primary interest are significantly related to training with relationships in the directions suggested by the hypotheses.

Given the support in the bivariate analysis, an OLS regression model is constructed to estimate the effects of Firm Internal Labor Markets, the use of flexible staffing practice, and High Performance Work Systems practices, controlling for basic establishment characteristics. To begin with, I examine to what extent the provision of formal core employee training can be explained as a function of the establishment's internal labor markets structure. I want to see, after controlling for basic firm characteristics, whether FILMs features remain a strong predictor of core employee training efforts. Then, the flexible staffing practices and dimensions of HPWS characteristics are entered into the model separately. I will pay special attention to 1) how the bundles of practices jointly improve our explanation of training opportunities, 2) the effect of each individual practice and 3) if and how the effect of Internal Labor Markets structure on training is changed as a result.

ANALYSIS AND RESULTS

As reported in Table 4-1 (A, B), the regression analysis involves a series of steps. In the first step, seven variables on basic establishment characteristics are entered in the model, and jointly they explain 8.9% of the variation in the provision of training. Among these features, only the effect of establishment size is significant in this initial analysis. The positive association between size and training seems to be fairly strong, which is consistent with findings from previous studies.

In the second step, Firm Internal Labor Markets features of formalization and FILM are incorporated in the model. With the addition of these two variables, the effect of establishment size is greatly reduced (unstandardized coefficient for log size drops from 15.03 to 6.18), though the result still shows that larger establishment is positively

Table 4-1A OLS Regression Coefficients Predicting Core Training (Weighted by Organizational Size): 452 Establishments from NOS II data, 1996-1997

	Model 1	**Model 2**	**Model 3**	**Model 4**
Constant	10.091	-1.554	-2.511	2.589
	(10.033)	(9.578)	(11.528)	(11.939)
Org Characteristics:				
Log Size	15.026***	6.181*	5.373*	4.729
	(2.488)	(2.615)	(2.664)	(2.770)
Organizational Type	5.072	7.458	8.650	4.907
	(4.751)	(4.618)	(4.596)	(4.967)
Percent Female	.082	.614	.056	.037
	(.042)	(.040)	(.041)	(.041)
Percent White	-.034	-.017	-0.088	-.044
	(.067)	(.063)	(.063)	(.063)
Unionization	-.083	-.128	-.174	-.114
	(.127)	(.020)	(.121)	(.121)
Comp1 (domestic)	-2.956	-4.154*	-3.795*	-4.183*
	(1.902)	(1.808)	(1.796)	(1.788)
Comp2 (foreign)	0. 022	-.479	-.292	-.652
	(2.071)	(1.949)	(1.933)	(1.912)
Org Internal Labor Market				
Formalization		3.803***	3.732***	3.393***
		(.795)	(.799)	(.801)
FILM (Firm Internal Labor		7.142***	7.013***	5.883***
Market)		(1.624)	(1.650)	(1.689)
Flexible Staffing				
Part-time (Pct in Core)			.038	.034
			(.067)	(.066)
Oncall (yes/no)			12.731**	11.454**
			(3.792)	(3.775)
Temp in Core Job (yes/no)			4.722	.060
			(6.155)	(6.171)
HPWS				
Hpws1: discretion				-3.256
				(2.143)
Hpws2: incentive				4.434**
				(1.697)
Hpws3: skill				7.648**
				(2.653)
F Change		**29.949*** **	**4.028** **	**5.533*** **
Adj-R Square	**.089**	**.194**	**.211**	**.234**
Number of Cases	452	452	452	452

Note: *p<.5, **p<.01, ***p<.001 and Standard Errors of B in Parentheses.

associated with more training. Another organization characteristic, domestic competition, turns out to be significant in the second model. Interestingly enough, competition is negatively associated with training, suggesting that firms facing more domestic market challenge actually provide less training. Recall our first two hypotheses that assert formalization and FILM are positively affecting training. Results show both of the two Internal Labor Markets features significantly related to training, reporting a positive association. Controlling for basic establishment characteristics, with one unit increase in the establishment's formalization level (as measured on a scale from 0 to 6), there is a 3.8% increase in core employee's training opportunity on average. Similarly for FILM (on a scale from 1 to 4), one unit increase in the FILM level brings about 7.14% increase in the core employee training. The F change for the second model is highly significant (F Change=29.949, p=.000), and adding the two Internal Labor Markets features greatly increases the amount of variance in training explained by the model, raising the adjusted R-square from .089 to .194. On the whole, my first two hypotheses are supported with the findings: establishments that are more formalized and with more established internal labor markets offer more training to core employees.

In the third step, Model 3 incorporates three additional variables: the percentage of part-time workers in core positions, the use of oncall workers, and the use of temporary employment in full-time jobs. Although all three variables are positively associated with training in the bivariate correlations, only oncall turns out significant in Model 3. Both part-time and temporary employment have a positive coefficient, but none reaches the significant level. However, the effect of oncall seems to be quite substantial. The unstandardized coefficient for oncall reports a value of 12.73, implying that

controlling for establishment characteristics and Firm Internal Labor Markets features, core employees in establishments with the use of oncall workers on average enjoy 12.73% more training opportunities. The addition of the block of variables as a whole produces an F change of 4.028 (p=.008). The two establishment characteristics, size and domestic competition, remain significant. And the two Internal Labor Markets features, formalization and FILM, are highly significant too, showing only a very slight decrease in their coefficients.

Two notes are taken here for the findings of this model. First, although some researchers have cited the rise of contingent employment as evidence for the decline of internal labor markets, FILMs features remain an important predictor for the provision of training. Second, the results on flexible staffing practices lend some support to the argument that firms adopt contingent employment but provide more training to core workers. This implies that the changing employment relationship may not be affecting core employees as severely as it affects non-core workers. The results also suggest that different flexible staffing practices might have different implications for firm's training agenda. For instance, a possible explanation can be suggested for the non-significant effect of the part-time staffing practice. Part-timers[33] in core positions are likely to be regular employees with weekly working hours reduced below 35 hours. In a strict sense, whether this group is contingent in nature depends upon whether people voluntarily seek reduced employment.[34] Therefore, such staffing practices may or may not reflect a lack of will to invest in human capital, and may have only a minimal effect on training. In

[33] Another possibility that part-time does not yield to be a significant predictor for training is the restricted variance in the data. Recall that in the sample, cases tend to cluster on the low extreme of the value, with over half (59%) of the establishments having 0 part-timer in the core employment and with a predominant majority of establishments (89.7%) use less than 50% of part-time in core positions.

[34] As Reskin has observed, contingent workers are not a homogeneous category and part-timers are not externalized workers in the way that temporaries and subcontracted workers are (Reskin 1996). It is noted that part-time employment has long been used to accommodate those with a special need for flexible work schedules, for instance women with children.

contrast, the use of oncall workers represents more closely some attempts to outsource labor and reveals firms' orientation to human capital, at least towards contingent labor.

Overall for Model 3, the adjusted R-square change is significant, although not substantial. Variables included in the model altogether explain 21.1% variance in the provision of training. These findings show that among our hypotheses of flexible staffing practices and training, only Hypothesis 4 concerning the use of oncall workers is generally supported: establishments with oncall workers provide more training to core employees.

The last step, step four, examines the potential effect of different dimensions of HPWS practices on training. Hypotheses 6 to 8 assert that a positive association is expected between training and the three HPWS dimensions. Results report that the incentive dimension and the skill dimension are positively related to training, thus providing support for Hypothesis 7 and 8. However, a somewhat surprising finding reveals that the discretion dimension of HPWS does not significantly affect training (the standard coefficient is negative rather than positive as we have expected). Further, the addition of these variables reduces the effect of establishment size to a nonsignificant level, giving more support to the view that establishment size may be only a proxy variable in predicting training. Also, the effect of FILM features decreases slightly. The unstandardized coefficient for formalization drops from 3.732 to 3.393, and that for FILM drops from 7.013 to 5.883. Among the flexible staffing practices, only oncall remains positively associated with training. The F change for the model is 5.533 (p=.001) and adjusted R-square suggests that Model 4 accounts for 24.4% of variation in training now. Thus, net of firm basic characteristics, Internal Labor Markets, and flexible staffing practice, the Incentive and Skill components of HPWS are positively related to training.

Although the result from Model 4 generally confirms the positive relationship between HPWS practices and training, it highlights an important point that has not been addressed in previous studies. The different effects of HPWS dimensions challenge the

assumption underpinning past research that HPWS practices do not vary in their implication for training. Results from the findings suggest that the Discretion Dimension, which includes practices most closely associated with HPWS such as team and quality group, is not positively related to training as the Incentive and Skill Dimensions are. Possibly, promoting team and worker participation reflects more of an employer's intention to engage workers and tap their knowledge and initiative, rather than to invest in enhancing employees' skills. Thus, while it is very important to approach HPWS in an integrated and systematic way, taking HPWS characteristics as an undifferentiated whole may mask the true relationship between individual HPWS practice and training. To further explore the relationship, I include the original seven measures into the regression model. Partial results are reported in Table 4-1B, with additional information on the standardized coefficients for each variable. Also, the correlation matrix for the seven practices of HPWS and training can be found in Table 4-2.

Although the matrix (table 4-2) shows that generally there is a positive correlation between individual HPWS practice and training, it is interesting to note that after controlling for other factors, Model 5 identifies only job rotation (B=11.768, p=.000) and profit sharing (B=9.287, p=.005) as positively associated with training among the seven practices.[35] Holding all other variables constant, core employees in establishments that have job rotation in practice enjoy 11.768% more training on average, and core employees in establishments with profit sharing scheme enjoy 9.287% more training. It is consistent with the general expectation that firms emphasizing multi-skilling end up providing more training to workers and that firms creating a financial bond with employees want to upgrade the skill level of the workforce.

[35] Results do not differ when I enter the seven measures separately into the model. Only job rotation and profit sharing yield a significant relationship with training. The coefficients are not reported here but can be offered upon request.

Table 4-1B OLS Regression Coefficients Predicting Core Training (Weighted by Organizational Size): 452 Establishments from NOS II data, 1996-1997

	Model 5
HPWS1: Discretion	
Quality Control	-2.995/-.045 (3.322)
Problem Solving Group	-2.528/-.033 (3.504)
HPWS2: Incentive	
Group Incentive	5.050/.047 (5.165)
Profit Sharing	9.287/.134** (3.279)
HPWS3: Skill	
Job Rotate	11.768/.171*** (3.069)
Cross Train	-.497/-.006 (3.669)
Paid Learning	-.342/-.004 (3.668)
Adj-R Square	**.244**
Number of Cases	452

Note:

1. *p<.05, **p<.01, ***p<.001
2. Unstandardized Coefficient/Standardized Coefficient (SE of B)
3. The Model also controls for other Firm Basic Characteristics, Internal Labor Markets, and Flexible Staffing Practices. The coefficients are not reported here but are available upon request.

However, the other five measures do not yield a significant relationship with training, even when I incorporate them into the model by themselves alone (analysis not shown here). Particularly curious is the finding concerning the practice of cross training. Although cross training is widely perceived to be closely associated with a firm's training efforts, the result does not bear out the expectation. When entered alone, cross training yields a positive yet not significant coefficient; and when other HPWS practices are controlled for, the coefficient turns negative and remains non-significant. The result

suggests the possibility that firms might favor informal (on-the-site) learning rather than formal learning in their cross-training practice.

Table 4-2 Correlation Table (Weighted by Establishment Size)

Panel A: Weighted Correlation

	pcttrain	quality	proslv	groupin	share	rotate	crosstn	pdlearn
pcttrain	1.000	.146	.103	.180	.275	.211	.080	.108
quality	.146	1.000	.332	.260	.214	.075	.228	.328
proslv	.103	.332	1.000	.153	.108	.121	.123	.105
groupin	.180	.260	.153	1.000	.231	-.008	.113	.301
share	.275	.214	.108	.231	1.000	.067	-.003	.183
rotate	.211	.075	.121	-.008	.067	1.000	.292	.043
crosstn	.080	.228	.123	.113	-.003	.292	1.000	.143
pdlearn	.108	.328	.105	.301	.183	.043	.143	1.000

Panel B: One-Tail Significant Level

pcttrain	.	.001	.014	.000	.000	.000	.045	.011
quality	.001	.	.000	.000	.000	.056	.000	.000
proslv	.014	.000	.	.001	.011	.005	.005	.013
groupin	.000	.000	.001	.	.000	.436	.008	.000
share	.000	.000	.011	.000	.	.077	.477	.000
rotate	.000	.056	.005	.436	.077	.	.000	.180
crosstn	.045	.000	.005	.008	.477	.000	.	.001
pdlearn	.011	.000	.013	.000	.000	.180	.001	.

What the findings highlight is that not all HPWS practices lead directly to more training. This should bring our attention to the first possibility that increased demand on skills (as in HPWS) does not automatically guarantee increased training efforts by firms. One explanation for this discrepancy is that training and selection can supplement each other as alternative strategies by organizations to meet their skill requirements (Appelbaum, Bailey, Berg and Kalleberg, 2000). Firms may choose to recruit workers with better skills rather than invest more in training later. The second possibility raises the question whether HPWS practices have in fact created a win-win situation for both firms and workers. If some innovations are adopted more for firms' purpose of better tapping employees' knowledge and initiative, workers may not be amply rewarded with more skill-enhancing opportunities. Either of the two situations should send an alarming

message to policy makers. The question for them to consider is who needs to shoulder the responsibility of training in the changing economy.

CHAPTER 5

SUMMARY AND DISCUSSION

The rising concern whether U.S. workers are appropriately trained to meet the challenge of changes in job requirements has pushed training into the forefront of public discussion again (Frazis, Gittleman, Horrigan and Joyce, 1998). The new employment relationship and the various novel practices in the work setting have propelled researchers to study the effects of these changes on the provision of training opportunities. The triangle of interest for the current paper revolves around exploring the relationship between firms' training efforts and Firm Internal Labor Markets, the flexible staffing practices and High Performance Work Systems.

A growing body of literature has emerged trying to tackle these inter-related issues, but lack of detailed information on organizations' HR practices from a national representative sample has greatly limited researchers' options. Using the rich data recently available from National Organizations Survey II (1996-1997), I am able to steer away from some of the methodological problems in earlier research and to address directly the questions of my research interest.

Some major findings of the paper are highlighted below. First, despite the view of an erosion in firm internal labor markets and despite popular accounts portraying firms as seeking to reduce commitment to employees, the vigor of FILMs as a predictor of training remains strong. Even after controlling for basic firm characteristics, flexible staffing and HPWS practices, both indicators of FILMs are highly significant. Consistent with our expectation, establishments that are more formalized and with more entrenched internal labor markets provide more training to core employees.

Second, the use of oncall workers as a flexible staffing practice is shown to be positively associated with training. The rise of contingent employment in the workplace signals the redefinition of employment relationship for many people. Flexible staffing reflects employers' intention to reduce human costs, hence a lack of will to invest further in training. But my findings lend more support to the alternative core-peripheral explanation that the changing employment relationship may not affect core employees as severely as it affects non-core workers. Firms with flexible staffing practices actually provide more training to core employees. It should also be noted that different flexible staffing practices might have different implications on firms' training agenda. Among the three variables in this group, only the use of oncall workers turns out to be significantly related to training.

Third, our findings suggest that both the skill and the incentive dimension of HPWS practices are positively associated with training. However, the effect of the discretion dimension is not significant. This result leads to the approach taken next to disaggregate HPWS rather than treat it as an undifferentiated whole. The test of the independent effect of HPWS practices reports that only job rotation and profit sharing among the various HPWS characteristics are positively affecting training.

With the unique advantages given by the merits of the data collection, this study furthers our understanding on how the diverse changes in the workplaces affect workers in terms of the skill-upgrading opportunities available to them. Specifically, the paper contributes to the literature of training and HPWS by exploring in greater detail how different dimensions (components) of HPWS affect the provision of training. While as suggested in the literature that an integrated system approach is needed to study HPWS, my analysis takes note of the different effects of HPWS practices and highlights the importance of a disaggregate approach. Future research could explore the training issue further by looking at how organizations meet their higher demands on skill. Both large-scale statistical analysis of survey results and in-depth case studies will be helpful to test

whether a selection versus training mechanism is at work. As the restructuring of workplace is likely to continue (Osterman, 2000), knowledge in this regard will be crucial to the making of a sound public policy in training, for the economy as well as for the labor force.

REFERENCES

Abraham, Katharine and Susan Taylor. 1996. "Firms' Use of Outside Contractors: Theory and Evidence." *Journal of Labor Economics* 14 (3): 394-424.

Althauser, Robert and Arne Kalleberg. 1981. "Firms, Occupations and the Structure of Labor Markets: A Conceptual Analysis." In *Sociological Perspectives on Labor Markets*, ed. by Ivar Berg. New York: Academic Press.

Appelbaum, Eileen. 1992. "Structural Change and the Growth of Part-time and Temporary Employment." In *New Policies for the Part-time and Contingent Workforce*, ed. by Virginia duRivage. Armonk, NY: M.E. Sharpe.

Appelbaum, Eileen and Rosemary Batt. 1994. *The New American Workplace: Transforming Work Systems in the United States.* Ithaca, NY: ILR Press.

Appelbaum, Eileen, Thomas Bailey, Peter Berg and Arne Kalleberg. 2000. *Manufacturing Advantage.* Ithaca, NY: Cornell University Press.

Arkinson, John. 1985. "The Changing Corporation." In *New Patterns of Work*, ed. by David Clutterbuck. Aldershot, UK: Gower.

Bailey, Thomas. 1992. "Discretionary Effort and the Organization of Work: Employee Participation and Work Reform Since Hawthorne." Paper, Teachers College and Conservation of Human Resources, Columbia University.

Bailey, Thomas. 1993. "Organizational Innovation in the Apparel Industry." *Industrial Relations* 32:30-48.

Barron, John, Dan Black and Mark Lowenstein. 1987. "Employer Size: The Implications for Search, Training, Capital Investment, Starting Wages, and Wage Growth." *Journal of Labor economics* 5: 76-89.

Bernhardt, Annette and Dave E. Marcotte. 2000. "Is 'Standard Employment' Still What It Used to Be?" In *Nonstandard Work*, ed. by Francoise Carre, Marianne A. Ferber, Lonnie Golden, and Stephen A. Herzenberg. Industrial Relations Research Association.

Bureau of Labor Statistics. 1996. "BLS Reports on the Amount of Formal and Informal Training Received by Employees." *BLS Website*.

Cappelli, Peter. 1995. "Rethinking Employment." *British Journal of Industrial Relations* 33 (4): 563-602.

Cappelli, Peter, Laurie Bassi, Harry Katz, David Knoke, Paul Osterman, and Michael Useem. 1997. *Change at Work.* New York: Oxford University Press.
Duncan, Greg and Frank Stafford. 1980. "Do Union Members Receive Compensating Wage Differentials?" *American Economic Review* 70:355-71.

Dulworth, Michael, Delmar Landen, and Brian Usilaner. 1990. "Employee Involvement Systems in U.S. Corporations: Right Objectives, Wrong Strategies." *National Productivity Review* 9:141-56.

Dunlop, John. 1966. "Job Vacancy Measures and Economic Analysis." In *The Measurement and Interpretation of Job Vacancies: A Conference Report*, National Bureau of Economic Research. New York: Columbia University.

Frazis, Harley and Diane Herz. 1995. "Employer-Provided Training: Results from a New Survey." *Monthly Labor Review* 118: 3-18.

Frazis, Harley and Maury Gittleman, Michael Horrigan and Mary Joyce. 1998. "Results from the 1995 Survey of Employer-Provided Training." *Monthly Labor Review* 6: 3-13.

Frazis, Harley and Maury Gittleman and Mary Joyce. 2000. "Correlates of Training: an Analysis using Both Employer and Employee Characteristics." *Industrial and Labor Relations Review* 53: 443-462.

Freeman, Richard and James Medoff. 1984. *What Do Unions Do?* New York: Basic Books.

Granovetter, Mark. 1981. "Toward a Sociological Theory of Income Differences." In *Sociological Perspectives on Labor Markets*, ed. by I. Berg. NY: Academic.

Hudson, Ken. 2001. "The Disposable Worker." *Monthly Review: An Independent Socialist Magazine* 52 (11): 43-56.

Kalleberg, Arne. 2000. "Nonstandard Employment Relations: Part-time, Temporary and Contract Work." *Annual Review of Sociology* 26(1):341-66.

Kalleberg, Arne and Jeremy Reynolds. 2000. "Organization Size and Flexible Staffing Arrangements in the United States." In *Nonstandard Work*, ed. by Francoise Carre, Marianne A. Ferber, Lonnie Golden, and Stephen A. Herzenberg. Industrial Relations Research Association.

Kalleberg, Arne and Moody, James. 1994. "Human Resource Management and Organizational Performance." *American Behavioral Scientist* 37 (7):948-63.

Kling, Jeffrey. 1995. "High Performance Work Systems and Firm Performance." *Monthly Labor Review* 118(5):29-37.

Knoke, David and Arne Kalleberg. 1996. "Job Training in U.S. Organizations." In *Organizations in America*, ed. by Arne Kalleberg et al. CA: Sage Publications.

Knoke, David. 1997. "Job Training Programs and Practices." In *Changes at Work*, ed. by Peter Cappelli, Laurie Bassi, Harry Katz, David Knoke, Paul Osterman and Michael Useem. NY: Oxford University Press, pp 122-153.

Knoke, David and Kalleberg Arne. 1994. "Job Training in U. S. Organizations." *American Sociological Review* 59:537-46.
Knoke, David and Yoshito Ishio. 1994. "Occupational Training, Unions, and Internal Labor Markets." *American Behavioral Scientist* 37:992-1017.

Lawler, Edward. 1992. "Adoption Employee Involvement Practices." In *Employee Involvement and Total Quality Management: Practice and Results in Fortune 1000 Companies*, ed. by Edward Lawler, Gerald Ledford, and Susan Mohrman. San Francisco: Jossey-Bass.

Marsden, Peter and Cynthia Cook. 1994. "Measuring Organization Structures and Environment." *American Behavioral Scientist* 37:891-911.

Mincer, Jacob. 1983. "Union Effects: Wages, Turnover, and Job Training." *Research in Labor Economics* 2 (Supp.): 217-52.

Montgomery, M. 1988. "On the Determinants of Employer Demand for Part-time Workers." *Review of Economi Statistics* 70:112-17.

Moss, Philip, Harold Salzman and Chris Tilly. 2000. "Limits to Market-Mediated Employment: from Deconstruction to Reconstruction of Internal Labor Markets." In *Nonstandard Work*, ed. by Francoise Carre, Marianne A. Ferber, Lonnie Golden, and Stephen A. Herzenberg. Industrial Relations Research Association.

National Research Council. 1999. *The Changing Nature of Work: Implications for Occupational Analysis.* National Academy Press, Washing: D.C.

Osterman, Paul. 1984. *Internal labor markets*. Cambridge, Mass: MIT Press.

Osterman, Paul. 1994. "Internal Labor Markets: Theory and Change." In *Labor Economics and Industrial Relations*, ed. by Clark Kerr and Paul D. Staudohar. Cambridge, Mass.: Harvard University Press.

Osterman, Paul. 1994. "How Common is Workplace Transformation and Who Adopts It?" *Industrial and Labor Relations Review* 47(2): 1739-188.

Osterman, Paul. 1995. "Skill, Training and Work Organization." *Industrial Relations* 34 (2): 125-146.

Osterman, Paul. 1997. "Work Organizations." In *Changes at Work*, ed. by Peter Cappelli, Laurie Bassi, Harry Katz, David Knoke, Paul Osterman and Michael Useem. NY: Oxford University Press.

Osterman, Paul. 2000. "Work Reorganization in an Era of Restructuring: Trends in Diffusion and Effects on Employee Welfare." *Industrial and Labor Relations Review* 53: 179-197.

Polivka, Anne and Thomas Nardone. 1989. "On the Definition of Contingent Work." *Monthly Labor Review* 112:9-17.

Powell, Walter and Paul DiMaggio, eds. 1991. *The New Institutionalism in Organizational Analysis.* Chicago: University of Chicago Press.

Plunkert M and Hayghe V. 1995. "Strong Employment Gains continue in 1994." *Monthly Labor Review*118 (2): 3-17.

Pfeffer, J. 1998. *The Human Equation: Building Profits by Putting People First.* MA: Harvard Business School Press.

Smith, Vicky. 1997. "New Forms of Work Organization." *Annual Review of Sociology* 23: 315-39.

Sonnenfeld, J. 1985. "Education at Wrok: Demystifying the Magic of Training." In *HRM: Trends and Challenges*, ed. by R.E. Walton and P.R. Lawrence. Boston: Harvard Business School Press.

Sonnenfeld, J. 1989. "Career System Profiles and Strategic Staffing." In *Handbook of Career Theory*, ed. by Michael Arthur, Douglas Hall and Barbara Lawrence. NY: Cambridge University Press.

Tomer, John. 2001. "Understanding High-performance Work Systems: the Joint Contribution of Economics and Human Resource Management." *Journal of Socio-Economics* 30: 63-73.

Useem, Michael. 1992. "Corporate Restructuring and Organizational Behavior." In *Transforming Organizations,* ed. by Thomas Kochan and Michael Useem. NY: Oxford University Press.

U.S. General Accounting Office (GAO). 1987. *Survey of Corporate Employee Involvement Efforts.* Washington, D.C.: GAO.

U.S. Department of Labor. 1989. *Report of the Commission on Workforce Quality and Labor Market Efficiency.* Washington, D.C.: U.S. Government Printing Office.

Wood SJ, ed. 1989. *The Transformation of Work?: Skill, Flexibility and the Labor Process*. Boston, MA: Unwin Hyman.

World Bank. 1990. *World Development Report 1990*. New York: Oxford University Press.