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Managing Customer Services: Human
Resource Practices, Turnover, and Sales
Growth

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This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions.

ABSTRACT

This study examines the relationship between human resource practices, employee quit rates, and organizational performance by drawing on a unique nationally representative sample of 354 customer service and sales establishments in the telecommunications industry. Multivariate analyses show that quit rates are lower and sales growth is higher in establishments that emphasize high skills, employee participation in decision-making and in teams, and HR incentives such as high relative pay and employment security. Quit rates partially mediate the relationship between human resource practices and sales growth. These relationships also are moderated by the customer segment that frontline employees serve.

MANAGING CUSTOMER SERVICES: HUMAN RESOURCE PRACTICES, TURNOVER, AND SALES GROWTH

Research in strategic human resource management has made considerable progress in documenting a link between organizational performance and human resource (HR) strategies that invest in the human capital of the workforce (e.g., Huselid, 1995; Ichniowski et al., 1996; Becker & Gerhart, 1996). These strategies, often referred to as "high involvement" or "high performance" systems, generally include coherent sets of HR practices that enhance employee skills, participation, and motivation (e.g., Appelbaum et al., 2000; Delery, 1998).

Recent reviews, however, have identified several weaknesses in this literature (Becker & Gerhart, 1996; Delery, 1998; Wood, 1999). First, empirical evidence of a HR-performance link is based almost entirely on blue collar workers in manufacturing (e.g., Appelbaum et al., 2000; Arthur, 1992; 1994; MacDuffie, 1995; Ichniowski et al., 1997; Snell & Dean, 1992; Youndt et al., 1996), despite the fact that roughly three quarters of employment is in services. Second, prior research has not identified the mediating employee behaviors or processes that explain the relationship between HR practices and performance. Third, while strategic human resource theory predicts that the HR-performance link should be contingent on external factors such as business strategy, only a few studies support this view (e.g., Arthur, 1992; Jackson, Schuler, & Rivero, 1989; Wright, Smart, & McMahan, 1995; Youndt et al.).

This paper contributes to the strategic human resource literature in three ways. First, I develop and test the thesis that voluntary turnover behavior mediates the relationship between HR practices and organizational performance. This argument hinges on the idea that high involvement practices help create firm-specific human capital that is critical for competitiveness. Second, I extend the study of high involvement practices to a new context that has grown dramatically in employment and strategic importance -- customer service and sales operations. By managing the boundary between the customer and the firm, customer service employees influence competitive advantage by shaping customer loyalty and buying behavior. Because of the importance of the customer-employee relationship, high employee turnover is likely to adversely affect sales. Relative to less experienced workers, more experienced employees are likely to provide better service and to sell more because of their firm-specific skills -- their tacit knowledge of the customers, the products, and the firm's information systems. Third, I consider whether these relationships are contingent on the customer segment served as firm-specific skills may be more valuable in some segments more

than others. Finally, while most studies of high involvement practices rely on small non-random samples, I draw on a nationally representative sample of establishments, including 354 sales centers in the U.S. telecommunications industry.

PRIOR RESEARCH

High involvement systems have been defined in various ways, but generally include three dimensions: high relative skill requirements, work designed so that employees have discretion and opportunity to use their skills in collaboration with other workers, and an incentive structure to enhance commitment and motivation (Appelbaum et. al., 2000; Delery & Doty, 1996; Huselid, 1995; Macduffie, 1995). Classic mass production approaches, by contrast, emphasize low skill requirements, narrow jobs with low discretion, and few incentives for discretionary effort.

Empirical studies of blue collar workers in manufacturing have shown that high involvement systems are associated with better performance in apparel, medical electronics, and steel rolling mills (Appelbaum et al., 2000); auto assembly (MacDuffie, 1995); semi-conductors (Bailey, 1998); steel mini-mills (Arthur 1992, 1994); steel finishing lines (Ichniowski, 1997); and general manufacturing (Snell & Dean, 1992; Youndt et al., 1996). The rationale for this positive relationship is that fundamental changes in markets and technology have reduced the advantages of traditional mass production systems that focus on cost minimization alone. High involvement practices provide employees with the skills, opportunities, and incentives to use new technology effectively and to produce goods that compete on cost, quality, and innovation.

This argument for a positive relationship between high involvement practices and organizational performance should generalize to production-level services if these operations face competitive conditions and new technologies that are similar to manufacturing. In the 1970s and early 1980s, for example, services did not face the level of national or international competition faced by manufacturers. Since then, however, market deregulation has intensified competition in many industries (e.g., banking, trucking, airlines, telecommunications). Similarly, advanced information systems and process reengineering have created opportunities to compete on cost, quality, and customization. The HR-performance link, therefore, should generalize to these sectors (e.g., Pfeffer, 1998), but empirical evidence is slim. One study of bank loan officers did find that 3 HR practices (results-oriented appraisals, employment security, and profit sharing) were associated with higher financial performance (Delery & Doty 1996).

The nature of work in service and sales, however, is distinct from manufacturing. While manufacturing involves the interaction between technology and workers to produce a product, service work entails the interaction of an employee and customer in a transaction for a service, a sale, or both. In this "interactive service work" (Leidner, 1993), employees manage the boundary between the firm and the customer, and employee behavior shapes customer behavior and loyalty (e.g., Mills, et al., 1983). Loyal customers are critical to sales growth because they tend to buy a wider range of products and more value-added products (e.g., Reichheld, 1996). Case studies show that customer loyalty (or conversely, turnover) is correlated with employee loyalty (or turnover) (e.g., Heskett et al., 1997). Thus, any theory of high performance in services needs to consider how HR practices influence the customer-employee relationship.

In this study, I argue that high involvement HR practices allow employees to develop firm-specific human capital that enables them to interact effectively with their customers. High involvement practices also induce employee commitment to the firm, lowering turnover (e.g., Arthur, 1994; Huselid, 1995; Shaw et al., 1998). Long-term employees with deep tacit knowledge of products, customers, and work processes are in the best position to maximize sales while delivering quality service. Thus, high involvement practices are likely to contribute to higher sales directly, by creating a workforce capable of managing its customer base, and indirectly, through lower turnover. This argument is consistent with a resource-based theory of the firm (Barney, 1995): by building firm-specific human capital, high involvement practices create resources that are valuable, rare, and hard to imitate, thereby conferring competitive advantage. In this study, I explicate this theory as it applies to interactive service environments.

There are three types of firm specific skills that interactive service employees need: knowledge of products, of customers, and of processes. Product knowledge includes an understanding of specific product features, service agreements, pricing, packaging, and a range of contingencies such as product availability for particular locations. In telecommunications services, customers may choose a basic service (e.g., local or long distance service), enhanced features (call waiting, call handling, caller identification, broadband lines that offer faster data transmission, etc.), product bundling, or customization. The availability of these options is contingent on the customer group, marketing strategy, network capacity, and state regulations.

Customer knowledge includes an understanding of the demand characteristics of each customer base as well as specific customers. It covers employees' ability to gather relevant customer information purposes of customizing and negotiating sales. It also includes employees' relationships with customers, either personally or through the company's brand name. Knowledge of work processes includes the ability to navigate information systems, to understand the work flow from point of sales to service delivery, and to understand how the company's processing capabilities affect service and sales for each customer and product offering.

High involvement HR practices help build this kind of firm-specific human capital. First, they emphasize the selective hiring of employees with high general skills (or formal education) plus firm investment in initial training. This combination provides the firm with a skilled workforce capable of on-going learning. In current markets, intense competition and the proliferation of new products leads to constant change in marketing, pricing, and packaging. On-going learning is critical because employees need to integrate new product and sales information into their existing knowledge base, and to explain these on-going changes to the customer.

The second dimension of high involvement systems involves the design of work to provide opportunities for individual discretion and on-going learning. In customer services, individual discretion should produce higher sales because employees are able to respond immediately to customer demands and to take advantage of sales opportunities when interacting with the customer. Individual discretion also should be associated with lower turnover, as in the large body of research on job characteristics (e.g., Hackman & Oldham, 1980), which has shown that greater autonomy and variety are associated with higher satisfaction and lower turnover intentions at the individual level of analysis (Cotton & Tuttle, 1986; Hom & Griffeth 1986).

Work design in high involvement systems also includes opportunities for continuous learning through employee collaboration in teams. Researchers generally distinguish between "off-line" groups (in which employees and supervisors meet periodically), and "on-line" groups, such as self-directed teams, where groups rather than individuals form the basic unit of production and are responsible for many decisions. In service and sales, collaboration in both types of teams is likely to pay off because it creates opportunities for on-going learning -- not because participation changes the content of work itself (e.g., sales agents still interact individually with customers). Batt (1999), for example, found that service and sales

representatives in self-directed teams did not have different job duties than those in traditionally-supervised groups, but had higher sales productivity because they benefited from better learning and problem-solving on how to handle customers and new technology. Other empirical studies of the performance of semi-autonomous or autonomous teams in production-level services show mixed results, and few have examined turnover behavior (see Cohen & Bailey, 1997).

The third dimension of high involvement systems includes HR incentives such as on-going investment in employee development, trust, high relative pay, and commitment to job security. These incentives are likely to motivate long-term commitment by employees. Firms signal distrust, for example, when they use technology for electronic monitoring and control; and some studies have found that electronic monitoring is associated with higher turnover (e.g., Carayon, 1993; Shaw et al., 1998). Efficiency wage theory provides a theoretical rationale for why higher wages lead to lower quit rates by reducing workers' incentive to seek another job. Some empirical research has found a significant relationship between lower individual turnover and higher compensation levels (Leonard 1987; Powell, Montgomery, & Cosgrove 1994; Shaw et al., 1998), as well as employment security (Cotton & Tuttle 1986; Shaw et al. 1998).

In contrast to the high involvement model, an alternative approach to services follows the engineering logic of mass production manufacturing. Individual efficiency is high because workers learn standardized tasks through repetition (e.g., Levitt, 1972). Labor costs are minimized through low investment in selection, training, participation or compensation. Information technology is used primarily to automate tasks and electronically monitor performance. However, customer satisfaction and loyalty is likely to suffer because employees have limited discretion to meet customer needs and because the division of labor creates multiple hand-offs (Schlesinger & Heskett 1991). In sum, this argument suggests three hypotheses:

H1: High involvement HR practices will be negatively related to voluntary turnover.

H2: High involvement HR practices will be positively related to sales growth.

H3: Voluntary turnover will partially mediate the relationship between high involvement practices and sales growth.

Contingency Perspectives

If a link exists between high involvement practices, quit rates, and sales growth, then it is reasonable to examine whether these relationships hold at a general level or whether they

are contingent on other external factors. If the customer-employee relationship is the critical factor in interactive service work, then it suggests that two external conditions are relevant: variation in the product market (or customer base served) and variation in the labor market. Drawing on the resource-based view of the firm, two questions arise. First, are quit rates more detrimental to sales growth in some markets versus others? Second, are high involvement practices more valuable (confer greater competitive advantage) in some markets versus others?

The first question concerning quit rates hinges on whether firm specific capital is more valuable and irreplaceable in some markets versus others. On the product market side, arguably firm-specific knowledge is more valuable for employees who sell complex or customized products compared to those who sell simple commodities. Typically, the more complex or customized the product, the more value-added the customer, and the more employees have opportunities to develop personal relationships with customers. If this logic holds, quit rates should be more detrimental to organizations that target higher value added customers.

On the labor market side, the question is to identify where firm-specific skills are more difficult to replace. Drawing on internal labor market theory (e.g., Osterman, 1984), firm-specific skills will be more difficult to replace for those positions that depend heavily on external hiring, or ports of entry. They will be less difficult to replace for positions that are filled from within the organization because the promoted employees will bring their firm-specific human capital with them. These arguments suggest the following hypothesis:

H4: Quit rates will be more detrimental to sales in establishments that serve higher value added customers or that rely heavily on the external labor market for new hires.

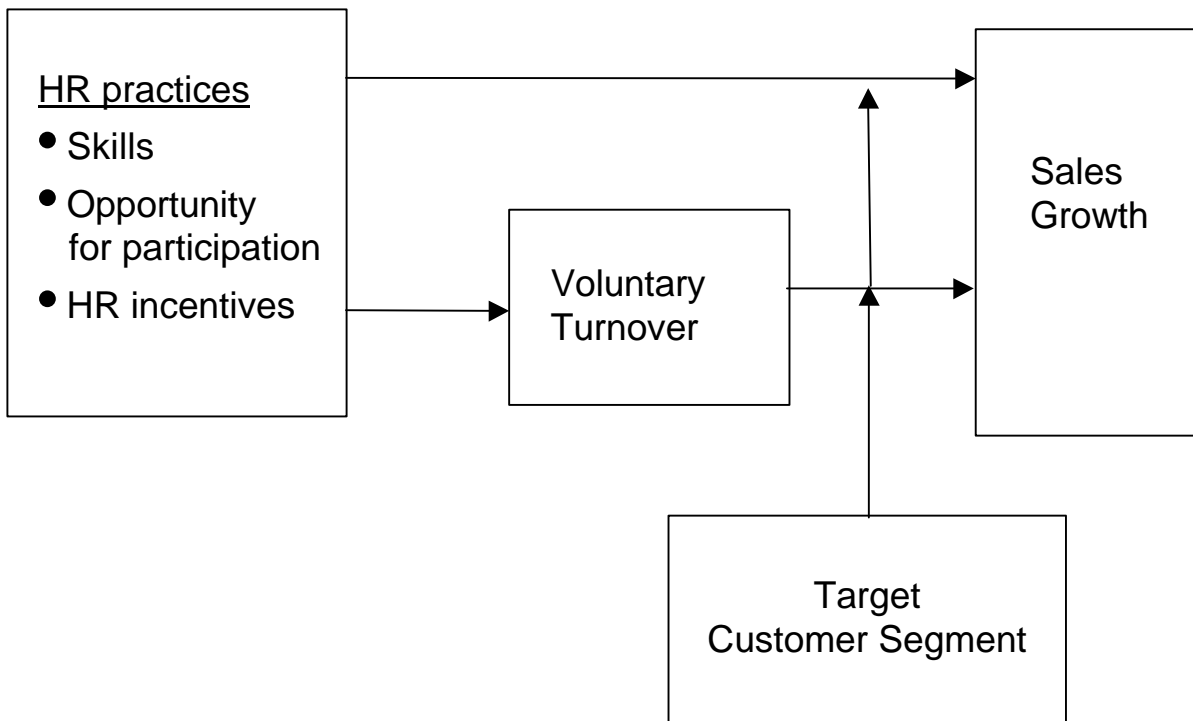
The second question, concerning the relative value of high involvement practices, also is likely to hinge on product and labor market issues. High involvement practices may be viewed as a strategy for quasi-professionalizing the non-managerial workforce -- enhancing skills, discretion, and commitment. In manufacturing, for example, high involvement practices enhance the capability of high school educated blue collar workers, not engineers or technical staff. In service and sales settings, however, "production-level" jobs range from those involving high school educated workers selling commodities in the mass market to those requiring a college-educated professional to serve as an account executive. In markets serving high end or high margin customers, firms tend to define the work as professional, and hence, high involvement practices are likely to be widespread. For high end customers,

therefore, high involvement practices may be viewed as the price of entry, and therefore, are unlikely to confer any special competitive advantage. For lower value-added customers in the mass market, however, the workforce is comparable to blue collar workers in manufacturing. Here, high involvement practices are rare and difficult to imitate. The question is whether they are sufficiently valuable to confer competitive advantage. The literature on mass customization (e.g., Pine, 1993) suggests they would be valuable because even mass market consumers are demanding customization and service bundling. This line of argument suggests the following hypothesis.

H5: High involvement practices will confer greater competitive advantage to establishments serving mass market customers compared to those serving higher value-added customers.

In summary the relationships between human resource practices, turnover, and sales growth are depicted in Figure 1. Human resource practices should influence sales growth both directly, and indirectly, through employee quit rates. These relationships should be contingent on the customer segment served.

Figure 1
HR Practices, Turnover, and Sales Growth



METHODS

I used several techniques to minimize measurement problems. As suggested by Becker and Gerhart (1996:792), I analyzed comparable establishments within one industry; and because HR practices vary considerably within establishments for different occupational groups (e.g., Jackson, Schuler, & Rivero, 1989), I focused on the "core" workforce defined as the largest group of non-managerial employees (e.g., Arthur, 1992, 1994; Delery & Doty, 1996; Osterman 1994, 2000). In this study, core employees are service and sales representatives.

In addition, because the data are from a nationally representative sample of service centers, it was not possible to survey multiple respondents per establishment. To improve reliability, I used only general managers as respondents because research suggests that they are less optimistic than HR managers (Wright et al., 1999). Also, as recommended by Becker and Gerhart (1996:791), I used extensive field research, including site visits to fifteen customer service centers in distinct markets (local, long distance, cellular, cable) and customer segments (residential, small business, middle market) in six telecommunications companies in five geographic regions. Each visit included interviews with the general manager, middle managers, supervisors, and service workers; and shadowing of workers. I used this field research to develop and pre-test the survey with general managers from sites I had already visited.

I also used outside information as a random check to verify survey responses. First, I compared survey items (date establishment founded, primary market, and size) to data contained in the Dun and Bradstreet listing. The means for each variable in the two data sets are not statistically significantly different. The mean date of founding in each data set, for example, is 1986 ($r = .75$). The primary industry segment is a categorical variable (wireline, wireless, cable, internet), and is correlated at $r = .78$. The mean establishment size in the Dun and Bradstreet listing is 108 (S.D. 144), and in the survey data, it is 119 (S.D. 174), ($r = .55$). Size estimates are likely to be larger in the survey data because the industry is rapidly expanding and consolidating, and the Dun and Bradstreet data was collected almost 1 year prior to the survey data. Second, I examined union contracts and found that the wage rates and job titles reported by managers at specific Bell companies were comparable to those in the corresponding union contracts. Third, I compared my survey data to that in the Current Population Survey for the telecommunications industry (CPS, 1998). The most comparable group in the CPS are clerical and sales workers. The 1998 median annual pay in the CPS is \$31,200 for union clerical and sales workers and \$26,000 for non-union workers, compared to

\$33,000 for union workers and \$28,000 in my sample. The 1998 CPS unionization rate is 32 percent while that of my sample is 38 percent. Given the fact that I over-sampled large establishments that tend to pay higher wages and to be more heavily unionized, these comparisons are reasonably consistent.

Sample

The sample is a nationally representative stratified random sample drawn from the Dun and Bradstreet listing of establishments. Establishments were stratified by size (10-99, 100-plus employees), SIC code (4812, cellular; 4813, wireline; 4841, cable; Internet services), and state location. I over-sampled establishments with over 100 employees so that the results would represent a larger percentage of the industry's workforce. Because Internet service providers (ISPs) are not systematically captured by SIC code, ISPs were identified in the Directory of National Dial-up Providers and Area Codes of Operation. The sample breakdown is: 53 percent in wireline, 24 in wireless, 16 percent in cable TV, and 7 percent in Internet services.

A university-based survey team administered the telephone survey in the fall, 1998. The general manager at each site received a letter and a follow-up phone call to set up a phone interview. Participants received a copy of a benchmarking report. The survey averaged 52 minutes, and yielded a 54 percent response rate. To check for response bias, I estimated a logit model with the dependent variable equal to 1 if the establishment participated in the survey. Internet service providers were somewhat less likely to respond, and single establishments were somewhat more likely to respond, and these are controlled for in the data analysis.

Measures

For the dependent variables, I focused on two outcomes: the average annual voluntary turnover rate and the natural log of the percent change in sales in the prior two-year period. The measure of turnover excludes discharges, retirements, transfers, and promotions. In measuring high involvement practices, there are many methodological challenges, as discussed in the prior literature (e.g., Arthur, 1992; Huselid, 1995; MacDuffie, 1995; Ichniowski et al., 1996; Delery, 1998). Past studies have used various data reduction techniques (factor analysis, theoretically derived additive indices, or cluster analysis), and each involves some trade-offs. I chose to use theoretically driven additive indices, an approach also followed by Appelbaum et al. (2000), MacDuffie (1995), Osterman (1994, 2000), and Youndt, et al. (1996), among others. I conceptualized three dimensions of high involvement used in prior research:

(skill level, work design, and commitment-enhancing HR incentives). I chose not to test individual HR practices because theory and much empirical evidence shows that any 1 practice is unlikely to substantially affect performance. I chose not to use factor analysis because each of the 3 dimensions may be accomplished in a variety of ways, as Delery (1998) and others have pointed out. For example, different types of teams (on-line or off-line) provide vehicles of employee learning.

The use of additive indices assumes that high involvement practices are additive in relation to performance. It is a conservative approach that may understate the "synergies" or multiplicative effects of combining practices. It assumes that firms may achieve incremental results by investing in some high involvement practices, but they will achieve the most positive results through a full range of high involvement practices (e.g., Appelbaum, 2000; Ichniowski et al., 1997). In the example of teams above, having both on-line and off-line teams is likely to create more opportunities for learning than having one type of team.

Some researchers have used cluster analysis to capture the idea that high involvement practices together produce better results than HR practices taken individually. Cluster analysis aggregates cases (or observations) that are similar to one another along a number of HR dimensions into a small number of clusters. The technique does not make any assumption about whether relationships among the HR variables are additive or multiplicative. I chose not to use cluster analysis because it may overstate the extent to which discrete systems exist because continuous variables are replaced by dummy-coded variables. Based on my field research, I did not find discrete systems in telecommunications service and sales centers that resembled the kind of best practice model of lean production found in the auto industry (e.g., MacDuffie, 1995).

Independent Variables

To capture the basic skill requirements of the job, I included two measures: a) years of formal education of the typical (median) core employee (an indicator of selectivity as well as general skills); and b) the amount of formal and informal on-the-job training needed for an entry-level employee to become proficient (in years). The variables were transformed to z scores, with mean zero and a standard deviation of one. The skill index is the mean of these two variables.

For the work design index, I used two measures for individual discretion and two for employee collaboration in teams. The individual discretion scales use a 1-5 Likert response format, where 1 is little or no control and 5 is complete control. Discretion over work methods

includes eight questions adapted from MacDuffie (1995) (degree of influence over tasks, tools, work methods, pace of work, schedules, vacations, and technology design, Cronbach's alpha = .79). I developed 4 additional questions for this study to capture discretion over customer interactions. Two of the four are highly correlated and are used in this analysis: control over handling non-routine requests and control over the pace of serving customers (Cronbach's alpha = .60). Team participation includes the percent of employees that participate in regular off-line problem-solving groups and the percent that participate in self-directed teams. To create the index, I transformed the variables to z scores and calculated the mean value of the four variables.

Human resource incentives are of four types: electronic performance monitoring, on-going training, pay level, and employment security. Monitoring is an indicator of trust and is measured by the percent of work time that the typical employee is electronically monitored (reverse coded). On-going training indicates the firm's commitment to develop employees and is measured by the number of weeks a typical core employee receives each year. Pay is the natural log of the median annual base pay of the core workforce. Employment security is the percent of the core workforce that is permanent and fulltime, as opposed to part-time or contingent. I transformed all variables to z scores and took their mean value for the HR incentive index.

In addition, I created a mean index of the ten HR practices in order to test the models involving mediation and moderation. The index was transformed into a z score and then interacted with each customer segment dummy variable. Similarly, the quit rate was standardized and interacted with each customer variable. The use of standardized z scores in creating interaction terms allows for direct interpretation of the interaction term in relation to the mean of the interacted variable; it also reduces multicollinearity (Cohen & Cohen, 1983: 325).

To identify customer segments, establishments were dummy coded for whether they served all customers in their market (a universal channel) or a particular segment (e.g., middle market, small business, or residential). If they served more than 1 segment, I asked them to answer all questions as they pertained to the segment with the largest volume of customers. Universal channels are the omitted category because they represent a traditional or undifferentiated approach by geographic area rather than by customer segment. They tend to be smaller and located in small towns and rural areas. I also separated out operator service centers (included in the analysis of quit rates, but not sales growth). Sales for national or global accounts are not represented in this sample because they often are based in small

offices inside of larger establishments, and so they are not identifiable through the Dun and Bradstreet listing. In this sample, 22 percent of establishments serve all customers; 19 percent target the middle market; 24 percent, small business; 30 percent, residential; and 5 percent are in operator services.

I included several controls that have been found to influence HR practices. For example, investment in human capital is likely to be greater among larger firms that have more resources or seek legitimacy (e.g., Jackson & Schuler, 1995; Osterman, 1994). Controls for organizational characteristics include whether the organization is a branch of a parent company, whether it is owned by a Bell company, and the percent of the workforce that is female. A series of dummy variables control for industry segment: cellular, Internet service, cable TV or wireline (the omitted category). Union presence is a dummy variable because the core workforce is narrowly defined so that all core workers in an establishment are either all union or all non-union.

RESULTS

Table 1 provides the means, standard deviations, and pairwise correlations of the variables. The average annual quit rate is 13.7 percent (S.D. 15.8), and the average sales growth rate is 30 percent over two years (mean log of sales is 4.66, S.D. .33). With respect to HR practices, the actual mean values (rather than standardized scores) are reported in Table 1. The typical core worker has 13.7 years of formal education and takes 6.1 months to become proficient in the job. On average, 51 percent of core employees participate in offline problem-solving groups and 17 percent in self-directed teams. The performance of the typical employee is electronically monitored 36 percent of work time. Average median annual base pay is \$26,152 (natural log 10.09, S.D. .51); and 89 percent of employees are permanent and fulltime.

In general, the correlations between dependent and independent variables have the predicted signs, but not all HR practices are equally related to the two outcomes. All but 3 of the 10 HR variables are significantly negatively related to turnover, and all but 2 are significantly positively related to sales growth ($p < .10$). The 3 HR measures (education level, on-going training, and electronic monitoring) that are not correlated with turnover are significantly positively related to sales growth. Similarly, the two HR practices that are not related to sales growth (initial training and employment security) are significantly correlated with turnover. The skill, work design, HR

incentive, and full HR indices are significantly negatively related to turnover (0.15-0.28, $p < .05$) and positively related to sales growth (0.14-0.27, $p < .05$).

High Involvement Practices and Voluntary Turnover

To examine Hypothesis 1, I estimated a tobit model because the dependent variable (aggregate quit rates) is left-censored at zero. Censoring occurs when the independent variables for the entire sample are observed, but there is only limited information for some observations for the dependent variable. Use of Ordinary Least Squares (OLS) regression with censored data produces biased estimates. The tobit model uses all of the information, including information about the censoring, and provides consistent estimates of the parameters (Long, 1997:187-9). For the sales equations, I used OLS regression because there was no censoring of the data.

Table 1: Means, Standard Deviations, and Pairwise Correlations

	Means	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11
1 Annual quit rate	13.664	15.771	1.000										
2 Percent chg. sales (log)	4.657	0.336	-0.105	1.000									
3 Wireless market	0.237	0.426	0.200	-0.020	1.000								
4 Cable TV market	0.158	0.365	-0.048	-0.195	-0.242	1.000							
5 Internet market	0.071	0.257	0.062	0.413	-0.154	-0.120	1.000						
6 Wireline market	0.523	0.500	-0.158	-0.046	-0.584	-0.454	-0.288	1.000					
7 Bell company	0.246	0.431	-0.030	-0.134	0.098	-0.248	-0.132	0.178	1.000				
8 Branch	0.801	0.400	0.024	0.003	0.009	0.179	-0.139	-0.036	0.254	1.000			
9 Female (percent)	0.630	0.299	-0.013	-0.196	-0.056	0.251	-0.299	0.039	0.089	0.129	1.000		
10 Union presence	0.153	0.360	-0.188	-0.147	-0.217	-0.120	-0.117	0.342	0.414	0.154	0.207	1.000	
11 Middle market target	0.192	0.395	0.025	0.102	-0.103	-0.172	0.034	0.208	-0.012	0.079	-0.278	-0.148	1.000
12 Small business target	0.243	0.429	0.020	0.091	-0.037	-0.047	0.075	0.027	-0.033	-0.101	-0.061	-0.040	-0.276
13 Residential target	0.299	0.459	0.035	-0.050	0.012	0.274	-0.036	-0.190	0.014	0.124	0.200	0.119	-0.319
14 Operator services	0.048	0.214	0.083	-0.067	0.092	-0.061	-0.062	0.003	-0.006	-0.087	0.138	0.125	-0.110
15 Formal education (yrs.)	13.717	1.696	-0.015	0.288	0.018	-0.297	0.231	0.073	0.032	0.029	-0.441	-0.243	0.424
16 Initial training (yrs.)	0.512	0.565	-0.196	-0.086	-0.174	-0.059	-0.046	0.220	0.151	0.117	0.023	0.224	0.093
17 Work discretion	3.012	0.674	-0.214	0.209	-0.025	-0.208	0.215	0.055	-0.100	-0.092	-0.290	-0.297	0.304
18 Customer discretion	3.711	0.786	-0.166	0.112	-0.103	0.086	0.006	0.002	0.045	0.101	0.079	0.029	-0.067
19 Problem-solving grps.	0.510	0.376	-0.182	0.144	-0.002	-0.059	0.102	-0.008	-0.097	-0.217	-0.068	-0.149	0.089
20 Self-directed teams	0.170	0.330	-0.097	0.109	-0.068	-0.059	0.161	-0.006	-0.090	-0.103	-0.113	-0.130	0.141
21 Elec. monitor (rev. code)	0.638	0.405	-0.088	0.116	0.043	-0.228	0.134	0.057	-0.066	-0.089	-0.247	-0.177	0.186
22 On-going training (mos.)	0.467	0.396	0.020	0.117	-0.012	0.068	0.070	-0.070	0.021	0.174	0.016	0.024	0.096
23 Median annual pay	26152	15722	-0.239	0.169	-0.235	-0.169	0.025	0.329	0.127	0.110	-0.288	0.118	0.415
24 Employment security	0.894	0.195	-0.171	0.082	-0.076	-0.018	-0.054	0.099	0.031	0.069	-0.037	0.083	0.157
25 Job skill index	0.000	1.000	-0.146	0.136	-0.109	-0.242	0.128	0.200	0.129	0.100	-0.284	-0.009	0.348
26 Work design index	0.000	1.000	-0.255	0.229	-0.077	-0.093	0.188	0.018	-0.096	-0.120	-0.152	-0.209	0.177
27 HR incentive index	0.000	1.000	-0.202	0.215	-0.108	-0.146	0.079	0.162	0.042	0.115	-0.235	0.012	0.343
28 HIWS index	0.000	1.000	-0.277	0.271	-0.132	-0.191	0.181	0.148	0.007	0.018	-0.282	-0.112	0.369

For all correlations > .11, p. < .05; for all correlations > .09, p. < .10.

TABLE 1: Means, Standard Deviations, and Pairwise Correlations

	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12	1.000															
13	-0.370	1.000														
14	-0.127	-0.147	1.000													
15	0.016	-0.255	-0.166	1.000												
16	-0.019	-0.118	-0.095	0.038	1.000											
17	-0.031	-0.272	-0.201	0.434	0.135	1.000										
18	-0.042	0.100	-0.154	0.038	0.163	0.327	1.000									
19	-0.045	-0.096	-0.039	0.150	0.059	0.312	0.125	1.000								
20	-0.086	-0.027	-0.061	0.150	0.077	0.286	0.097	0.225	1.000							
21	0.027	-0.203	-0.168	0.327	0.082	0.419	0.074	0.045	0.052	1.000						
22	-0.041	0.016	-0.125	0.069	0.076	0.093	0.180	0.065	0.039	0.014	1.000					
23	-0.091	-0.154	-0.130	0.338	0.259	0.205	-0.010	0.075	0.050	0.179	-0.016	1.000				
24	-0.034	-0.113	-0.085	0.222	0.202	0.157	0.132	0.134	-0.033	0.060	0.109	0.235	1.000			
25	0.002	-0.255	-0.181	0.718	0.726	0.388	0.140	0.145	0.149	0.282	0.107	0.408	0.291	1.000		
26	-0.073	-0.116	-0.174	0.300	0.172	0.741	0.599	0.642	0.623	0.228	0.144	0.123	0.150	0.321	1.000	
27	-0.054	-0.192	-0.216	0.407	0.257	0.382	0.171	0.137	0.046	0.555	0.503	0.622	0.624	0.456	0.282	1.000
28	-0.065	-0.236	-0.251	0.574	0.437	0.704	0.455	0.463	0.410	0.468	0.346	0.485	0.464	0.696	0.781	0.762

For all correlations > .11, p. < .05; for all correlations > .09, p. < .10.

For Hypothesis 1, I estimated a series of 6 equations. The first includes the base case of market and organizational control variables alone. The second, third, and fourth examine the added significance of each dimension of HR practices (skill level, work design, and incentives). The fifth equation estimates the three dimensions together; and the sixth, the full additive index.

The results support Hypothesis 1 (Table 2). The base case is significant, with a chi2 of 37.75 ($p = .0001$). Each dimension of HR practices is significantly negatively related to quit rates and each significantly improves the chi2 explanatory power of the model. Work design variables have the largest relationship in both size and significance. In Equation 5, the work design index continues to be large and significant while the incentive index is marginally significant ($p < .10$), and the skill index is insignificant. In the last equation, a 1-standard deviation change in the HIWS index lowers quit rates by 6.3 percentage points ($p < .001$).

Some of the control variables are significant. Quit rates are significantly higher in cellular enterprises compared to wireline enterprises. Branches of larger organizations have significantly higher quit rates, while unionized establishments have significantly lower quit rates (between 9 and 12.5 percent depending on model specification). The relationship between customer segment targeted, HR practices, and turnover is also noteworthy. Establishments serving the mass market have significantly higher quit rates than the omitted group (6.6 percentage points higher in residential and 15 percent in operator services). Also, the coefficients on residential and operator services become smaller and insignificant when the HR indices are added in Equation 6. This suggests that it is the HR practices used in serving particular segments, not the segment itself, that influence quit rates. However, for the middle market, the coefficient on the segment becomes more significant *in the presence of the HR index*. That is, once HR practices are controlled for, the turnover rate in establishments serving middle market customers is 6.5 percentage points higher than in those taking the universal approach.

High Involvement Practices and Sales Growth

To examine Hypothesis 2 regarding sales growth, I repeated the analyses presented in Table 2, but using OLS regression. Table 3 reports the standardized betas from these analyses, which show support for Hypothesis 2. The base case explains 25.6 percent of the variance. In Equation 2, the skill scale alone is positive, but insignificant. In equations 3 and 4, the work design and incentive indices separately are significant. The three scales together in Equation 5 explain an additional 2.8 percent of the variance over the base case. The HR

incentive index has the most significant positive relationship with sales growth (.177, $p < .01$), while work design approaches conventional levels of significance (.11, $p < .06$). The skill scale is insignificant. Finally, after controlling for market segments and organizational factors a 1-standard deviation change in the high involvement index is associated with a 16.3 percentage point increase in sales.

TABLE 2: Relationship Between Human Resource Practices and Aggregate Quit Rates (Tobit Model)

	<i>Equ. 1</i>	<i>Equ. 2</i>	<i>Equ. 3</i>	<i>Equ. 4</i>	<i>Equ. 5</i>	<i>Equ. 6</i>
Industry segment						
Wireless market	7.863 **	6.734 **	6.386 *	6.985 **	5.516 *	5.425 *
Cable TV market	-0.284	-2.105	-1.784	-1.375	-3.064	-3.164
Internet market	4.528	6.008	7.200 +	4.749	7.623 +	7.334 +
Organizational features						
Bell company	1.233	2.142	1.330	1.375	1.839	1.948
Part of lgr. Organization	5.260 +	6.513 *	3.918	6.134 *	5.198 +	5.799 *
Female (percent)	1.209	-0.234	0.997	-0.221	-0.524	-1.005
Union presence	-9.872 **	-10.217 **	-12.520 ***	-9.131 **	-11.851 ***	-11.186 ***
Customer segment						
Middle market target	3.831	5.522 +	3.971	5.670 +	5.848 +	6.522 *
Small business target	4.740 +	4.341	2.559	3.956	2.236	2.360
Residential target	6.595 *	5.697 *	5.094 +	5.736 *	4.387	4.336
Operator services	14.903 **	12.592	10.094 *	11.981 *	7.968	7.838
Human resource practices						
Job skill index		-3.578 **			-1.695	
Work design index			-5.199 ***		-4.451 ***	
HR incentives index				-3.338 **	-1.981 +	
HIWS index						-6.335 ***
Constant	0.241	0.628	3.513	1.075	3.744	3.397
Sample	326	326	326	326	326	326
Likelihood ratio chi2	37.890	46.790	61.060	45.970	67.120	65.720
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo r2	0.016	0.020	0.026	0.020	0.029	0.028

*** = $p < .001$; ** = $p < .01$; * = $p < .05$; + = $p < .10$

TABLE 3: Relationship Between Human Resource Practices and Sales Growth (Std. betas)

Industry segment	<i>Equ. 1</i>	<i>Equ. 2</i>	<i>Equ. 3</i>	<i>Equ. 4</i>	<i>Equ.5</i>	<i>Equ. 6</i>
Wireless market	-0.001	0.000	0.014	0.007	0.016	0.019
Cable TV market	-0.241 ***	-0.238 ***	-0.219 ***	-0.222 ***	-0.214 **	-0.207 **
Internet market	0.377 ***	0.376 ***	0.361 ***	0.371 ***	0.365 ***	0.355 ***
Organizational features						
Bell company	-0.156 *	-0.158 *	-0.150 *	-0.151 *	-0.139 *	-0.154 *
Part of lgr. Organization	0.127 *	0.125 *	0.136 *	0.110 +	0.128 *	0.120 *
Female (percent)	-0.012	-0.010	-0.013	0.006	-0.005	0.002
Union presence	-0.074	-0.076	-0.053	-0.087	-0.059	-0.068
Customer segment						
Middle market target	0.100	0.097	0.101	0.058	0.072	0.073
Small business target	0.128 +	0.128 +	0.149 *	0.145 *	0.166 *	0.152 *
Residential target	0.128 +	0.130 +	0.141 *	0.150 *	0.152 *	0.155 *
Human resource practices						
Job skill index		0.013			-0.077	
Work design index			0.118 *		0.111 +	
HR incentives index				0.171 **	0.177 **	
HIWS index						0.163 **
Sample size	270	270	270	270	270	270
F ratio	8.910 ***	8.080 ***	8.580 ***	9.120 ***	8.080 ***	8.950 ***
R-squared	0.256	0.256	0.268	0.280	0.291	0.276
Adj R-squared	0.227	0.225	0.237	0.249	0.255	0.245
Chg R-squared (from base case)		-0.003	0.009	0.022	0.028	0.018

*** = p<.001; ** = p.<.01; * = p.<.05; + = p.<.10

Several control variables are also significant in the expected direction. Consistent with industry level data, cable TV establishments have significantly lower sales growth and Internet services have significantly higher growth (compared to wireline services). Centers that are branches of larger organizations have higher sales growth, while Bell companies (concentrated in saturated markets in regulated local service) have significantly lower growth rates. Relative to centers that serve all customers, residential and small business centers have higher growth rates.

Tests of Mediation

To test whether quit rates mediate the relationship between HR practices and sales growth (Hypothesis 3), I followed the procedure outlined in Baron and Kenny (1986:1176). First, I tested whether the independent variable (HIWS index) is a significant predictor of the mediating variable, quit rates (e.g., Table 2, equation 6). Then, in Table 4, I examined the relationships between the HIWS index, quit rates, and sales growth. Equation 1 presents the control variables only; Equation 2, adds the HIWS index; Equation 3, quit rates; and Equation 4, both the HIWS index and quit rates. Partial mediation occurs when, in the presence of quit rates, the previously significant relationship between the HIWS scale and sales growth is reduced in size and significance. Full mediation occurs when that previous relationship is reduced to zero.

The results provide support for a partially mediated model. Both the HIWS index (Equation 2) and quit rates (Equation 3), taken alone, are significant predictors of sales growth, and explain significantly more variance over the base case. In the presence of quit rates, however, the size and significance of the HIWS index is reduced; and the change in R2 with the addition of the HIWS scale is not significant (Equation 4).

TABLE 4: Relationship Between Human Resource Practices, Turnover, and Sales Growth (std. betas)

	<i>Equ.1</i>	<i>Equ. 2</i>	<i>Equ. 3</i>	<i>Equ. 4</i>	<i>Equ. 5</i>	<i>Equ. 6</i>
Industry segment						
Wireless market	-0.001	0.019	0.031	0.047	0.021	-0.011
Cable TV market	-0.241 ***	-0.207 **	-0.246 ***	-0.214 **	-0.220 ***	-0.210 **
Internet market	0.377 ***	0.355 ***	0.385 ***	0.366 ***	0.366 ***	0.352 ***
Organizational features						
Bell company	-0.156 *	-0.154 *	-0.154 *	-0.158 *	-0.123 *	-0.150 *
Part of lgr. organization	0.127 *	0.120 *	0.149 *	0.139 *	0.126 *	0.123 *
Female (percent)	-0.012	0.002	-0.005	0.005	0.013	0.008
Union presence	-0.074	-0.068	-0.092	-0.080	-0.094	-0.092
Customer segment						
Middle market target	0.100	0.073	0.132 +	0.109	0.094	0.097
Small business target	0.128 +	0.152 *	0.153 *	0.168 *	0.140 *	0.125 +
Residential target	0.128 +	0.155 *	0.148 *	0.161 *	0.140 *	0.170 *
HIWS index		0.163 **		0.128 *	0.099	-0.097
Annual quit rate			-0.167 **	-0.136 *	0.073	
Interactions						
Middle mkt * Quits					-0.165 *	
Small bus. * Quits					0.001	
Residential * Quits					-0.257 **	
Middle mkt * HIWS						0.055
Small bus. * HIWS						0.148 *
Residential * HIWS						0.285 ***
Sample	270	270	260	260	260	270
F ratio	8.910 ***	8.950 ***	8.670 ***	8.370 ***	8.200 ***	8.510 ***
R-squared	0.256	0.276	0.278	0.289	0.335	0.318
Adj R-squared	0.227	0.245	0.246	0.255	0.294	0.281
Chg R-squared.		0.018	0.018	0.009	0.040	0.036
F for Chg. R-squared		6.160 *	6.230 *	3.067	4.498 *	3.976 *

*** = p<.001; ** = p.<.01; * = p<.05; + = p.< .10

Tests of Moderation

To test whether the customer segment moderates these relationships, I examined a series of interaction terms, following Baron and Kenny (1986). The results show that quit rates are more detrimental to centers serving middle market customers and residential customers (relative to universal channels) (Table 4, Equation 5). This finding is consistent with Hypothesis 4. The results also show that the targeted segment moderates the relationship between high involvement practices and sales growth (Hypothesis 5, Equation 6). Compared to universal channels, mass market residential centers that use high involvement practices have significantly higher sales growth (0.285, $p < .001$), as do small business centers (0.148, $p < .05$).

Discussion and Limitations

The findings in this study may be summarized as follows. First, greater use of high involvement practices is associated with lower voluntary turnover and higher sales growth in customer service and sales centers. On average, a one-standard deviation increase in the high involvement index is associated with 46 percent lower turnover (6.3 percentage points over a mean of 13.66 percent turnover) and 16.3 percent higher sales growth. Second, quit rates partially mediate the relationship between HR practices and high sales growth. This finding is consistent with the idea that high involvement practices help build firm specific human capital that is valuable for competitiveness and difficult to replace.

A third finding concerns the relationship between quit rates and sales growth, which was found to be contingent on the customer segment served. Quit rates are particularly detrimental for centers targeting the middle market, and this finding is consistent with the idea that firm specific human capital is particularly valuable in centers serving high value added customers, where employees are likely to serve as dedicated account representatives and develop personalized relationships with customers. It is also consistent with information from field research regarding the structure of internal labor markets. Because middle market centers tend to hire primarily college-educated professionals, the centers rely heavily on the external labor market. They cannot rely on promoting employees from the small business centers (with firm specific knowledge products and processes) because most do not have college degrees. In this sample, only 30 percent of small business agents have college degrees, compared to over 70 percent of middle market agents. Thus, from the perspective of both customer and labor markets, quit rates are likely to be more detrimental to sales in high end markets.

The finding that quit rates are also detrimental for centers serving residential customers is surprising on its face, because the positions are relatively lower skilled; but it is consistent with my field research. Residential centers are ports of entry, depending heavily on external labor markets for new hires. While the jobs require only a high school diploma, most require firm-specific skills that cannot be purchased on the outside market. The Bell companies, for example, use complex Unix-based or Legacy computer systems; their initial formal training for new hires ranges from 8-16 weeks. The survey data for this study shows that it takes on average 6 months for a residential service representative to become fully proficient. Thus, in the residential centers, it appears that turnover is costly due to labor market issues -- the demand for firm specific skills that cannot be purchased externally. Quit rates are not as problematic for small business centers because they are often located close to residential centers and the latter provide a large internal labor market pool of trained employees who apply for promotions.

Fourth, the relationship between high involvement practices and sales growth is contingent on the establishment's primary customer base. Compared to universal channels, high involvement practices are associated with higher sales growth in small business and residential centers. In the middle market, high involvement practices appear to be the price of entry, and affect sales growth primarily indirectly through turnover. For small business and residential centers, however, high involvement practices are directly related to higher sales. This finding is consistent with a resource based view of the firm: high involvement practices are rare and difficult to imitate in more cost-conscious markets, but they confer value because employees are better able to meet the demand for customization and service bundling. The survey data is consistent with this interpretation: the average use of high involvement practices is significantly greater in higher compared to lower value added markets (standardized values for middle market customers of 2.6, s.d. 3.8; for small business, -.27, s.d. 3.6; and for residential, -1.46, s.d. 3.2).

It could be that the contingent relationship between HR practices and sales growth is a function of variation in sales opportunities for distinct customer segments. This argument is unlikely to hold for the middle market because these centers have the highest average sales growth (38 percent) (followed by small business centers with 37 percent and residential with 28 percent). This explanation may account for the outcomes of universal centers. They invest considerably in high involvement practices (second to the middle market), and benefit through low quit rates (11 percent); but they have the lowest average sales growth (22 percent). A

review of the establishments that follow this approach shows that they are disproportionately more likely to be small, to define their market as local (as opposed to regional, national, or international), and to be located in small towns and rural areas. Many are traditional rural or independent telephone companies. These factors suggest that their investment in high involvement practices does not pay off because the local geographic scope of their market limits opportunities for sales growth.

There are several limitations to this study. I attempted to minimize the effects of common method bias in a number of ways, including the use of general managers as respondents and the use of context-specific questions about objective HR practices rather than about subjective impressions. I also compared the study data to external sources, and found consistency between the study data and Dun & Bradstreet data, union contracts, and the CPS.

Also, as in all cross-sectional studies, the issue of causality is problematic. To explore alternative explanations, I examined other variables that might account for the results, including the local 1998 unemployment rate for each establishment (U.S. Bureau of Labor Statistics Local Area Unemployment Series, <ftp.bls.gov/pub/time.series/la>.) and the local cost of living, with data from the *1999 Geographic Reference Report*, Economic Research Institute (ERI). I considered factors such as size, age, ownership changes, size of customer base, market share, market scope, and age of the parent company. These measures, however, are highly correlated with those already in the study and did not produce any significant differences in the results.

Conclusions

This study contributes to the literature on strategic human resource management by examining high involvement systems in an increasingly strategic, but neglected context -- customer service and sales operations. The findings provide some support for the idea that high involvement practices affect organizational performance by enhancing firm-specific human capital. This study is based on a nationally representative sample so that the findings are generalizable to service and sales operations in the telecommunications industry. They are likely to generalize to similar operations in other industries because the demand for customization in service delivery is quite widespread. Mass customization arguably characterizes markets in banking, insurance, airlines, computer software, and suppliers in goods producing industries such that investing in the human resource capabilities of frontline service employees is likely to have an economic pay off.

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