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# HIGH-INVOLVEMENT MANAGEMENT AND WORKFORCE REDUCTION: COMPETITIVE ADVANTAGE OR DISADVANTAGE?

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**Although interest in the workplace trends of downsizing and high-involvement work practices continues to grow, research examining the intersection between them has been limited. In this study, we examine (1) how layoffs moderate the relationship between high-involvement work practices and productivity, and (2) how continued investments in these work practices throughout layoff periods maintain workforce productivity. Findings indicate a negative relationship between high-involvement work practices and productivity in workplaces with higher layoff rates. However, workplaces that continue investments in high-involvement work practices are able to avoid productivity losses, as compared to workplaces that discontinue such investments.**

The current business environment of rapid change and innovation has forced many organizations to evaluate how human resources (HR) contribute to their effectiveness. In the resource-based view of the firm, investment in high-performance or high-involvement work practices are thought to develop distinct capabilities in employees, leading to superior firm performance (Barney, 1991; Barney & Wright, 1998; Lawler, 1992; Pfeffer, 1998). High-involvement workplaces use "a system of management practices giving their employees skills, information, motivation, and latitude and resulting in a workforce that is a source of competitive advantage" (Guthrie, 2001: 181). However, firm-specific employee capabilities can only be sustained if they fit the opportunities available in an environment and consistently generate value higher than the costs associated with maintaining the capabilities (Lepak & Snell, 1999). Wright, Dunford, and Snell (2001) argued that research should examine how high-involvement workplaces manage internal resources, including employees and HR systems, and thereby sustain a competitive advantage over time.

A key issue with respect to the management of internal resources is the use of layoffs within high-involvement workplaces. Layoffs began as a strategy exclusively for cost cutting, but they have also become part of a management strategy for adjusting workforce competencies (McKinley, Zhao, & Rust, 2000; Osterman, 2000). Unlike other workforce reduction strategies (e.g., natural attrition), layoffs increase a firm's flexibility over the transition process; firms can quickly and efficiently remove employees whose skills no longer fit the firms' strategies or add to their market values. Yet the purported benefits of layoffs, such as increased efficiency and profitability, have received mixed empirical support, often explained by the impact of layoffs on surviving employees (Cappelli, 2000a; Cascio, 1993, 2002; McKinley, Sanchez, & Schick, 1995).

Layoffs can be perceived as a violation of the psychological contract between an organization and its employees, resulting in decreased trust and greater stress in the workplace (De Meuse, Bergmann, Vanderheiden, & Roraff, 2004; Mishra & Spreitzer, 1998). Consequently, layoffs are associated with decreased commitment and productivity from surviving employees (Appelbaum, Everard, & Hung, 1999; Brockner 1992; Niehoff, Moorman, Blakely, & Fuller, 2001). Such negative effects may be more costly for high-involvement workplaces, as these workplaces rely expressly on employee involvement and motivation. To date, however, little attention has been paid to layoffs within workplaces investing in high-involvement work practices. Thus, our first objec-

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tive was to examine the moderating effect layoffs have on the relationship between high-involvement work practices and workplace productivity.

Our second objective was to understand how high-involvement workplaces can implement layoffs, when necessary, without suffering negative effects on productivity. We drew on resource-based and dynamic capabilities views to address this issue (Teece, Pisano, & Shuen, 1997; Wright et al., 2001). Dynamic capabilities are defined as "the firm's ability to integrate, build, and reconfigure internal and external competencies . . . to achieve new and innovative forms of competitive advantage given path dependencies and market position" (Teece et al., 1997: 516). This approach emphasizes the need for firms to actively manage internal resources, including people and HR practices, to sustain core competencies over time. Accordingly, as long as workplaces continue to make HR investments throughout layoff periods (spans of time during which employees are laid off), layoffs may not be incongruent with high-involvement management. We argue that continued investments will lessen perceived contract breaches by providing enhanced support and skill development to surviving employees, thus reinforcing employees' value in the workplace.

This study extends the resource-based view in two important ways. First, we examine the impact of layoffs on the relationship between high-involvement work practices and productivity. Specifically, we argue that the negative effect of layoffs on surviving employees may be especially important in high-involvement workplaces. Second, our study addresses a previously neglected aspect of the resource-based view: the effect of high-involvement work practices over time. Using a longitudinal survey conducted by Statistics Canada in over 3,000 Canadian workplaces (Statistics Canada, 2004), we measure high-involvement work practices at two points in time to test our prediction that continued investments in employee capabilities mitigate the negative effects of layoffs in high-involvement workplaces.

## THEORETICAL BACKGROUND

A fundamental foundation of strategic human resource management (SHRM) derives from the resource-based view of the firm (Barney, 1991). The resource-based view suggests that investment in HR systems can develop employee capabilities that contribute to a sustainable competitive advantage (Barney, 1991; Barney & Wright, 1998; Huselid, 1995; Wright, Gardner, & Moynihan, 2003). Although a variety of HR practices have been examined in this field (see the recent review by Wood and Wall [2001]), increasing attention has been paid to HR practices that create firm-specific employee capabilities difficult for other firms to imitate or transfer (Lepak & Snell, 1999). In this paper, we refer to these HR practices as "high-involvement work practices."[1] High-involvement work practices cover a wide range of systems and routines. For instance, team-based production and semiautonomous work groups increase the social complexity and causal ambiguity of operations and thereby develop tacit knowledge and enhance the uniqueness of an organization's human capital (Lepak & Snell, 1999). Similarly, group-based incentives such as gainsharing can increase alignment between employee incentives and team-based work (Lawler, 1992), encouraging employees to apply their skills in new work designs. Other practices, such as flexible work design (e.g., job rotation and job enrichment) and information sharing (e.g., feedback), increase firm-specific human capital by helping employees see the bigger picture of workplace processes and operations (Ciavarella, 2003). Finally, traditional HR practices, such as training, increase employee understanding of their role in the firm's operations—important firm-specific knowledge. Thus, workplaces can strengthen their HR systems and increase firm-specific human capital by investing in high-involvement work practices (including training, teams, incentives, flexible job design, and information sharing), and thereby improve productivity.

Numerous studies have found support for a positive relationship between systems of high-involvement work practices and productivity (Arthur, 1994; Guest, Michie, Conway, & Sheehan, 2003; Guthrie, 2001; Huselid, 1995; Ichniowski, Shaw, & Prennushi, 1997), yet few studies examine how this relationship changes over time (Wright et al., 2001). In particular, the assumption that using a set of high-involvement work practices and employees at one point in time will be as successful in the future is limited; it ignores the changing environments in which firms operate (Priem & Butler, 2001). Recently, researchers have focused on the development of what have been labeled "dynamic capabilities" in order to

[1] We use the term because the HR practices in our study focus on developing unique skills through greater involvement. We acknowledge that our label could be encompassed by other terms commonly used in the literature, such as "high-performance" (Huselid, 1995), "flexible," and "innovative" work practices (Ichniowski, Shaw, & Prennushi, 1997). However, this debate about terminology is beyond the scope of our paper.

understand how firms remain competitive in changing environments (Teece et al., 1997). Within the resource-based view, the dynamic capabilities approach suggests that high-involvement firms "may require different skill sets implying a *release* of some existing employees. . ." and will need "processes to integrate, reconfigure, gain, and release resources to match and even create market change" (Wright et al., 2001: 713). In other words, firms must remain flexible and responsive, which may necessitate the use of both layoffs and high-involvement work practices in order to replenish the firm's stock of human capital. Below, we examine the consequences of using layoffs within high-involvement workplaces, as well as the potential benefits from continuing investments in high-involvement work practices during a period of layoffs.

### Layoffs and Productivity in the High-Involvement Workplace

Given the emphasis placed on the distinctiveness and value of employees within the resource-based view, it is important to understand how layoffs affect the relationship between high-involvement work practices and workplace productivity. Layoffs are permanent separations initiated by an organization and implemented either all at once or phased in over time. There are several important differences between layoffs and other workforce reduction strategies (e.g., attrition and early retirement). First, layoffs allow organizations to strategically control downsizing; management can target specific employees and determine the depth of the cuts. This control is essential for a workplace trying to adjust the skills and capabilities of its workforce. Second, layoffs increase workplace responsiveness to environmental change by facilitating quick removal of employees who lack appropriate skills. The flexibility and control offered by layoffs, however, come with some potentially significant costs to high-involvement workplaces. Specifically, layoffs negatively affect surviving employees' trust, perceived control, and involvement, which in turn reduces learning, creativity, and productivity (Appelbaum et al., 1999; Brockner, 1992; Niehoff et al., 2001). We posit that these negative effects may be particularly damaging in high-involvement workplaces, where employee skills and motivation are essential for sustained productivity.

High-involvement workplaces maintain strong HR systems by sending consistent, visible signals to employees about their importance in the workplace (Bowen & Ostroff, 2004). *Consistency* in an HR system is primarily related to vertical alignment (i.e., the link between high-involvement work practices and business strategy) and horizontal alignment (i.e., internal consistency among the practices); *visibility* reflects the extent to which high-involvement work practices are salient and observable to employees. A strong HR system—one high in consistency and visibility—sends an unequivocal message to employees about their value and about the direction of their workplace (Bowen & Ostroff, 2004). Layoffs contradict this message. The explicit removal of human capital creates uncertainty about the future of the organization, the security of one's job, and the degree of trust in an organization. This increased uncertainty may cause employees to question their importance and involvement in the organization. For example, Lam and Reshef (1999) found that for one Canadian hospital, downsizing (mostly through "deep layoffs") shortly after implementation of a total quality management (TQM) program was disastrous. The layoffs undermined many of the initial benefits achieved through TQM because employees viewed the initiative as having given them both an "illusion" and a "false sense" of empowerment (Lam & Reshef, 1999: 734). The researchers concluded that downsizing and quality improvement initiatives are "inherently incompatible" (Lam & Reshef (1999: 741).

When viewed through the lens of a psychological contract, layoffs can be interpreted by employees as a violation on the part of their organization (De Meuse et al., 2004; Mishra & Spreitzer, 1998). A psychological contract refers to an individual's expectations concerning obligations existing between an employee and an organization. These expectations are not necessarily derived from specific promises, but rather inferred from the employer's actions (Rousseau, 2001). Within a high-involvement workplace, the psychological contract is typically considered one of "mutual investment," whereby employees exchange commitment and effort for skills, involvement, and fair treatment (Tsui, Pearce, Porter, & Tripoli, 1997; Whitener, 2001). A perceived breach of this contract in the form of layoffs is expected to have negative consequences for employee work attitudes and behaviors (De Meuse et al., 2004). In response to layoffs, surviving employees may psychologically or physically withdraw from the workplace—psychologically, by withholding effort and involvement; physically, through absences and/or quitting (Mishra & Spreitzer, 1998). For instance, high-performing employees often take jobs elsewhere in order to avoid the uncertainties and ambiguities in a downsizing environment (Iverson & Pullman, 2000). This turnover will be costly to a high-in-

volvement workplace, as the departure of "high performers" includes the loss of valuable firm-specific skills (e.g., Guthrie, 2001). And since organizational learning is a valuable part of a resource-based firm (Snell, Youndt, & Wright, 1996), the loss of key employees can lower workplace productivity.

Therefore, layoffs create numerous problems for high-involvement workplaces, including sending inconsistent messages to employees, lowering employee motivation and morale, violating psychological contracts, and increasing "voluntary turnover." Severe layoffs (i.e., higher layoff rates) exacerbate these effects by increasing survivors' stress levels and exposure to layoff victims, both of which are positively related to role ambiguity and intent to quit and negatively related to job security and involvement (Brockner, Grover, & Blonder, 1988; Jick, 1985; Moore, Grunberg, & Greenberg, 2004). Furthermore, studying companies from 1987 to 1998, De Meuse and colleagues (2004) concluded that companies that conducted large-scale layoffs significantly underperformed, as compared to companies that conducted fewer layoffs, on profit margin, return on investment, return on equity, and market-to-book ratio. Taken together, these arguments suggest that higher layoffs rates will be more costly to workplaces that have previously invested in firm-specific employee capabilities (i.e., high-involvement work practices) and that rely on employees as a source of competitive advantage. Thus, we predict:

*Hypothesis 1. Layoffs moderate the relationship between high-involvement work practices and productivity in such a way that workplaces with more extensive high-involvement work practices suffer greater effects from layoffs than workplaces with less extensive high-involvement work practices.*

### Layoffs and Continued Investments in High-Involvement Work Practices

Despite the potentially negative impact of layoffs on employees in high-involvement workplaces, the dynamic capabilities framework suggests that adjustments to workforce composition may be necessary for firms to compete effectively. Wright and coauthors proposed that core competencies are produced from a "combination of the firms *[sic]* stock of knowledge (human, social, and organizational capital embedded in both people and systems) and the flow of this knowledge through creation, transfer, and integration in a way that is valuable, rare, inimitable, and organized" (2001: 716). In essence, building core competencies requires actively managing the employee mix and the system of HR practices in an organization. Although layoffs may not be desirable (Cascio & Wynn, 2004), they offer certain advantages necessary for firms requiring workforce transformation. Thus, a critical question emerges: How can firms engage in layoffs, allowing them to manage their stock of human capital quickly and efficiently, without suffering extra productivity losses, and in so doing form the necessary foundation for a sustainable advantage?

We argue that the key to this issue is continued investments in high-involvement work practices, defined as investments in these practices that are maintained throughout a layoff period. Such investments reflect the idea that HRM is a source of strategic value to be preserved. Conversely, many workplaces cut back on HRM as part of downsizing, in a manner consistent with the traditional view that HRM is a cost to be minimized (Brockner, 1992; Cascio, 2005). We refer to such cutbacks as discontinued investments in high-involvement work practices, defined as a workplace's reduction of investments in such practices throughout a layoff period. We posit that continued investments are critical in limiting the negative effects of layoffs in high-involvement workplaces.

Continued investments in high-involvement work practices have several important benefits. First, they can reduce uncertainty by preparing employees with skills to succeed in a downsizing environment (Mishra & Spreitzer, 1998). In a period of layoffs, employees often face expanded roles and increased workload, elevating the levels of stress and uncertainty in a workplace (Spreitzer & Mishra, 2002). High-involvement work practices, such as formal training, information sharing, and job rotation, facilitate improved skills and knowledge, which in turn increase employees' perceived control with new operating procedures (Applebaum, Everard, & Hung, 1999). Additionally, higher levels of employee competence can help employees manage their expanded roles more effectively (Brockner, Spreitzer, Mishra, Hochwarter, Pepper, & Weinberg, 2004).

Second, continued investments in high-involvement work practices can mitigate psychological contract violations. Continuance of high-involvement work practices increases the visibility and consistency of a workplace's HR system, particularly after a shock such as layoffs (Bowen & Ostroff, 2004). Chadwick, Hunter, and Walston (2004) reported some support for this argument when they examined downsizing in 107 hospitals in the northeastern United States. They found that those organizations demonstrating concern for employee mo-

rale and welfare in the layoff process—in a manner consistent with high-involvement management—to be more successful in terms of management's perception of the layoffs and financial outcomes.

Finally, employees may view continued investments in high-involvement work practices as rewards (Zacharatos, Barling, & Iverson, 2005) and consistent with the terms of a psychological contract of "mutual investment." For instance, Edwards, Rust, McKinley, and Moon (2003) reported that individuals subscribing to an "ideology of self-reliance" are less likely to perceive layoffs as a violation of the psychological contract. Such an ideology is more likely to be held by individuals who view themselves as marketable, a perception that makes layoffs a less threatening experience. Thus, employees in high-involvement workplaces may accept a trade-off of job security for increased training and skill enhancement, which make them more marketable than employees in a more traditional workplace (Cappelli, 2000b).

In sum, we propose that continued investments in high-involvement work practices are essential in maintaining a strong HRM system and increasing employee skills, motivation, and involvement, and thereby lessening the negative effects of layoffs on employees. These benefits will help mitigate the productivity losses predicted in Hypothesis 1. Thus, we predict:

*Hypothesis 2. Continued investments in high-involvement work practices lessen the negative consequences of layoffs on the relationship between these practices and workplace productivity. Specifically, the negative moderating effect of higher layoff rates on the relationship between high-involvement work practices and productivity is weaker when investments in such practices are continued than it is when investments in such practices are discontinued.*

## METHODS

### Sample

The data that we used in this study were collected by Statistics Canada as part of its Workplace and Employee Survey (WES; Statistics Canada, 2004). We chose this sample because it was longitudinal and contained information on HR practices, detailed layoff numbers, and revenues and expenditures. Data collection for this annual survey began in 1999, and each year's data relate to the prior 12-month period ending March 31. We used all publicly available survey years; these were 1999 through 2002. The unit of analysis was the workplace, defined by Statistics Canada as a business location having paid employees and included in a list maintained by the Business Register Division of Statistics Canada. Statistics Canada selected a nationally representative, stratified sample of participating workplaces in each year. Over 6,000 workplaces participated in the initial 1999 survey, which had a response rate of over 95 percent. However, workplaces with ten or fewer employees were not asked about some of their HR practices; thus, we did not include these workplaces in this study (approximately one-third of the initial sample). Additionally, we dropped nonprofit workplaces from this study (approximately 14 percent) because they did not have complete financial information (i.e., revenues). Finally, we dropped workplaces that did not participate in the survey in 2001 or 2002 from the sample (approximately 15 percent). Our usable sample was 3,080 workplaces that completed the 1999–2001 surveys and 2,970 workplaces that completed the 2002 survey. Analyses revealed no significant difference in the key variables (productivity, workplace size, layoff rates, and high-involvement work practices) when we compared workplaces present in all years to those not participating in 2001 or 2002. The mean workplace size was approximately 42 employees (s.d. = 82).

The primary respondent was a workplace HR manager, except in smaller locations, where the general manager or business owner completed the survey. Statistics Canada employed computer-assisted telephone interviews to conduct the surveys. Furthermore, Statistics Canada suggested that larger workplaces use multiple respondents to complete the survey, particularly accounting personnel, for specific financial information. To ensure the accuracy of information reported by respondents, Statistics Canada conducted analyses to identify unusual responses or trends in a workplace, following up with respondents and adjusting outliers or missing data when necessary (Patak, Hidiroglou, & Lavallee, 1998). Importantly, the Workplace and Employee Survey was very specific in instructing respondents to focus only on their own location when completing the survey. However, in some cases, workplaces from multisite operations may have reported organization-level information and, thus, we controlled for this possibility in our analyses. No information was available regarding whether the same individual within a workplace responded in all the survey years.

In testing our hypotheses, we considered the workplace level of analysis appropriate for several reasons. First, compared to layoffs occurring in other locations, layoffs in their immediate work-

place will be more important to employees. To the extent that layoffs are distal, employees will be less likely to experience survivor syndrome because their immediate coworkers have not been laid off and job security is less threatened (Turnley & Feldman, 1998). Second, given the potential for huge variations in HR practices across locations within a single organization, the workplace level more accurately identified the practices in a specific location (Wright et al., 2003). Additionally, compared to executives in large, diversified corporations, HR managers at the workplace level are more familiar with their own HR policies and practices (Huselid & Becker, 2000).

## Measures

***Productivity.*** We measured productivity as the logarithm of revenues minus expenditures per employee (e.g., Huselid, 1995). Whereas recent strategic HRM researchers have frequently measured productivity as revenues per employee (e.g., Datta, Guthrie, & Wright, 2005; Guthrie, 2001), we chose a measure that included labor costs such as wages and benefits. In a study examining longitudinal data from the U.S. Census Bureau, Cappelli concluded that "when job cuts make sales per employee rise, so do labor costs per employee, and when the former fall, so do the latter" (2000a: 511). In other words, a measure using revenues per employee (without expenditures) will only partially account for productivity changes resulting from downsizing. Additionally, to retain skilled workers, high-involvement workplaces often pay higher wages and benefits, an increased expenditure that may outweigh any efficiency gains related to implementing high-involvement work practices (Bailey, Berg, & Sandy, 2001; Cappelli & Neumark, 2001; Forth & Millward, 2004). Thus, it was important to use a measure of productivity capturing both revenue generated by employees and costs associated with maintaining a highly skilled workforce.

Respondents were asked to provide exact revenues and expenditures related to their workplaces. The questions were as follows: "What was the gross operating revenue from the sale or rental of all products and services for this location?" and "What were the gross operating expenditures for this location? Please include payroll and non-wage expenses and the purchase of goods." As noted above, Statistics Canada suggested that accounting personnel provide financial information in the larger workplaces. We created three measures of workplace productivity: 1999 productivity (a baseline control), and two dependent variables including 2001 and 2002 productivity.

***High-involvement work practices.*** The WES asked questions related to high-involvement work practices every second year, which enabled us to measure the practices at two points in time, in the 1999 and 2001 surveys. Although the exact practices in a workplace vary across industries and organizations (Becker & Gerhart, 1996), a typical high-involvement system includes training, teamwork, employee involvement, incentive compensation, and communication (Guthrie, 2001; Lawler, 1992; Pfeffer, 1998). The WES asked respondents to identify whether each of the following five practices existed on a formal basis in their workplace: flexible job design ($\bar{x}$ = .31), information sharing with employees ($\bar{x}$ = .49), problem-solving teams ($\bar{x}$ = .26), self-directed work groups ($\bar{x}$ = .10), and gainsharing ($\bar{x}$ = .15). In addition, respondents indicated whether or not formal training ($\bar{x}$ = .58) had been used in the prior 12-month period. All six practices were measured as dichotomous variables, with 1 for "yes" and 0 for "no." We created high-involvement work practices bundles for 1999 and 2001 using these six practices. The mean number of high-involvement work practices in a workplace was 1.73 and 1.44 in 1999 and 2001, respectively, and it ranged from 0 to 6 in both years. Approximately 40 percent of the sample reported using three or more of the practices in 1999, and 33 percent of the sample did so in 2001.

To verify our decision to combine the six practices, we employed the Mokken Scaling Program (MSP; Mokken, 1971; Molenaar & Sjitsma, 2000). Researchers have previously used this approach in constructing scales based on dichotomous HR practices (e.g., Gooderham, Nordhaug, & Ringal, 1999). Importantly, the MSP allows researchers to construct unidimensional scales based on Guttman's (1950) notion of cumulativeness using item-response theory (Molenaar & Sjitsma, 2000). In using the MSP, a researcher estimates a coefficient of scalability (*H*-value) for each individual practice, as well as for the total scale. One then uses the *H*-coefficient to assess the Guttman scalogram pattern by calculating the highest homogeneity (bivariate relationship) for each item in the scale (ranging from 0 to 1). Scales with *H*-values of at least .30 are classified as having acceptable fit. Additionally, the MSP provides a good approximation of the reliability coefficient rho (a statistic analogous to Cronbach's alpha). In this study, the rhos for the six-item 1999 and 2001 high-involvement work practices bundles were .65 and .63, respectively, and the overall *H*-values were .40 and .39 for the same years, respectively. Thus, the scales demonstrated adequate fit and reliability to justify combin-

ing the individual practices into single bundles (Molenaar & Sjitsma, 2000).[2]

Of course, our high-involvement work practices measures were not without limitations. First, they did not directly assess the importance of employees in a firm's business strategy. Huselid (1995) argued that the link between practices and productivity is stronger if the practices are aligned with a firm's strategy. To confirm that the measures of 1999 and 2001 high-involvement work practices reflected a workplace's strategic orientation, we examined the relationship between the bundles and the importance of employees in a workplace's business strategy. In the 1999 survey, respondents were asked about the extent to which "increasing employees' skills" and "increasing employee involvement/participation" were important in the general business strategy of their workplaces. Respondents answered each question using a five-point scale (1 = "not important," 5 = "crucial"). We combined the two questions to form a measure of the existence in a workplace of a "people strategy" ($\alpha = .79$). We conducted two ordinal logit models (StataCorp, 2003), with the 1999 and 2001 high-involvement work practices measures as the respective dependent variables and people strategy as the predictor. Additionally, we included multiple controls, described below (i.e., workplace size, industry, union density, 1999 layoffs, and 1999 productivity), in the models. The results confirmed that people strategy was positively and significantly ($p < .001$) related to the use of high-involvement work practices in a workplace. Importantly, people strategy explained more variance in the 1999 and 2001 high-involvement work practices measures than any other single variable in the model (the increase in pseudo-$R^2$ was .02 for each model). This result increased our confidence that the 1999 and 2001 high-involvement work practices measures reflected the importance of employee skills and involvement in a workplace's general business strategy.

A second limitation of the high-involvement work practices measures was the inability to assess employee perception of workplace HR practices. Although we do not directly address this issue in our study, other research has indicated a significant relationship between manager and employee perceptions of HR practices, as well as a link between HR practices and employee commitment (Whitener, 2003; Wright et al., 2003). Nevertheless, our results must be interpreted with these limitations in mind.

To test Hypothesis 2, we needed to assess whether workplaces continue or discontinue investments in high-involvement work practices. Given the problems associated with difference scores (see Edwards [2001] for a discussion of this issue), we did not calculate a simple change score (i.e., 2001 *HIWP* – 1999 *HIWP*) to determine whether high-involvement work practices were continued or discontinued. Instead, we entered the two components of a difference score into the regression model (i.e., 1999 and 2001 HIWP), as well as the interaction between them (Edwards & Parry, 1993). This approach allowed the coefficients to maximize the explained variance in the dependent variable without constraints. In this study, we defined continued investment in high-involvement work practices as high levels of these practices in both 1999 and 2001 and discontinued investments as high levels of these practices in 1999 but *low* levels in 2001.

***Layoff rate.*** Respondents reported the number of employees laid off during a year. We chose the two-year period 2000 and 2001 to measure layoff rates, as it captured all layoffs occurring between the 1999 and 2001 high-involvement work practices measures. The survey clearly distinguished layoffs from other types of turnover, including resignations, retirements, and firings (dismissal for cause). We calculated the layoff rate over the two-year period as 2000 layoffs plus 2001 layoffs divided by total employees in 1999. We then transformed the layoff rate using the logarithm of the layoff rate plus 1 (Tabachnick & Fidell, 2001). Finally, we created two dummy variables indicating whether or not a workplace conducted layoffs in 2000 and 2001 ("layoffs" = 1; "no layoffs" = 0). These variables accounted for potential differences in the time between layoffs and productivity as well as for the possibility that a workplace had multiple layoffs (Gilson, Hurd, & Wagar, 2004).

***Control variables.*** In view of prior research, we used numerous controls in the analyses, including

[2] It is important to note that we based our assessment of training on whether or not management provided it to employees during the survey year but based assessment of the other high-involvement work practices on their existence at year-end. We believed it was appropriate to bundle training with the other practices for several reasons. First, the MSP analyses confirmed that training displayed a significant fit with the other practices (based on individual and overall *H*-values). Second, we confirmed that a workplace's training budget was positively correlated with the other high-involvement work practices in 1999 and 2001 ($r = .15$ and $r = .13$, respectively), providing additional support for the view that our measure of training reflected the current state of training within a workplace and could be bundled with the other high-involvement work practices.

workplace size (log of total employees in 1999), workplace age (number of years operating at current location), industry (comprising 12 dummies), union density (percentage of full-time employees covered by collective bargaining agreements), 1999 layoffs, and change in workplace size. Research indicates that the positive relationship between high-involvement work practices and productivity is associated with certain industry characteristics (Datta et al., 2005). Additionally, we included the age and size of each workplace to control for the maturity and stage of development of a workplace's HR system (Guthrie, 2001; Jackson & Schuler, 1995). We anticipated union density would influence the use of layoffs, as a basic objective of unions is to protect member interests, such as job security and workload (Barling, Fullagar, & Kelloway, 1992; Iverson & Pullman, 2000). We also controlled for whether or not workplaces reported downsizing in 1999. As workplaces try to downsize, they often experience many problems and subsequently need to do it again (Cascio, 1993). We asked respondents to indicate whether their workplace downsized during 1999 (1 = "yes," 0 = "no"). Importantly, we also controlled for change in workforce size to account for other additions and deletions of employees during the study period. Employee-initiated turnover (e.g., resignations and retirements) and hiring and firing by employers during layoff periods were captured in this size change variable, which we calculated as the percentage of change in employment over the two-year period ([2001 *total employees* – 1999 *total employees*]/1999 *total employees*). Lastly, as noted earlier, we included control variables for the importance of employees in the general business strategy of a workplace (i.e., people strategy), multisite operations (1 = "multisite," 0 = "single-site"), 1999 productivity, and dummy variables indicating whether a workplace conducted layoffs in 2000 and 2001.

### Analyses and Weighting

The chronology of our measurement of the variables used in our analyses is as follows: we measured control variables from the 1999 survey (except for change in workplace size); we measured high-involvement work practices from the 1999 (before layoffs) and 2001 (after layoffs) surveys; we combined layoff rates from the 2000 and 2001 surveys; and we took measures of the dependent variable, productivity, from both the 2001 and 2002 surveys. We employed a moderated hierarchical regression model in which we first entered the control variables, 1999 and 2001 high-involvement work practices, and layoff rate into the model (step 1), then the interaction between the 1999 high-involvement work practices and layoff rate (step 2). In step 3, we entered the remaining two-way interactions necessary for testing a three-way interaction. Finally, we entered a three-way interaction between 1999 high-involvement work practices, layoff rate, and 2001 high-involvement work practices to test whether continued investments mitigated the negative effects of higher layoff rates on the relationship between the practices and productivity (step 4). We took similar steps for the two dependent variables, 2001 and 2002 productivity. To address the possibility of multicollinearity, we centered the variables used in the interaction terms (Aiken & West, 1991); variance inflation factors were below 2 in all models, well below the generally accepted threshold of 10 (Cohen, Cohen, West, & Aiken, 2003).

We used weights established by Statistics Canada to ensure that the sample did not overrepresent workplaces from a particular stratum (i.e., region, size, or industry) (Patak et al., 1998). We calculated the weights using the inverse of the probability of selection and employed these weights in calculating all results presented below.

## RESULTS

We present the descriptive statistics and regression models in Tables 1 and 2, respectively. In step 1, 1999 high-involvement work practices are not related to productivity in 2001 or 2002.[3] In step 2, the interaction between 1999 high-involvement work practices and layoff rate is negative and significant for 2001 ($p < .10$) and 2002 ($p < .05$) productivity. Following the procedures outlined by Aiken and West (1991) , we plotted the relationship between 1999 high-involvement work practices and productivity for workplaces at low and high layoff rates. Because results were consistent for both dependent variables, we only show the re-

[3] This finding was not entirely unexpected, given that our productivity measures included various labor costs, such as wages and benefits (e.g., Cappelli & Neumark, 2001). In an analysis not presented here, we defined productivity as revenues per employee (excluding expenditures) and found that 1999 high-involvement work practices were positively related to 2001 revenues per employee ($r = .08$, $p < .001$). This result is consistent in direction and magnitude with results of past research (e.g., Datta et al., 2005; Huselid, 1995). However, as we discussed earlier, a net measure of productivity is more appropriate for this study. Therefore, we utilize a productivity measure of revenues minus expenditures per employee in our analysis.

**TABLE 1**
**Descriptive Statistics[a, b]**

| Variable | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. 2001 productivity[c] | 0.02 | 0.06 | | | | | | | | | | | | |
| 2. 2002 productivity[c] | 0.02 | 0.06 | .73 | | | | | | | | | | | |
| 3. 1999 high-involvement work practices | 1.88 | 1.47 | −.03 | .01 | | | | | | | | | | |
| 4. Layoff rate | 0.08 | 0.17 | −.14 | −.13 | −.01 | | | | | | | | | |
| 5. 2001 high-involvement work practices | 1.57 | 1.31 | −.06 | .01 | .38 | −.09 | | | | | | | | |
| 6. Change in workplace size | 0.02 | 0.47 | −.28 | −.23 | −.01 | .04 | .10 | | | | | | | |
| 7. 1999 productivity | 0.02 | 0.03 | .31 | .24 | −.01 | −.05 | −.05 | −.10 | | | | | | |
| 8. 1999 downsizing | 0.14 | 0.34 | −.03 | −.07 | .02 | .00 | −.03 | .02 | −.08 | | | | | |
| 9. Union density | 0.12 | 0.27 | −.07 | −.09 | .05 | .00 | .02 | .02 | −.10 | .11 | | | | |
| 10. Workplace size[c] | 3.27 | 0.79 | −.19 | −.14 | .15 | −.08 | .23 | .01 | −.22 | .12 | .25 | | | |
| 11. People strategy | 3.18 | 0.84 | −.02 | −.02 | .34 | −.08 | .29 | .01 | −.05 | .11 | .12 | .09 | | |
| 12. Multisite operations | 0.32 | 0.47 | .06 | −.01 | .14 | −.19 | .22 | .00 | .02 | .10 | .15 | .21 | .08 | |
| 13. Workplace age | 14.86 | 16.30 | −.10 | −.09 | .02 | .00 | .02 | .05 | −.01 | −.04 | .16 | .10 | .03 | .04 |

[a] $n$ = 2,942 for cells corresponding to 2002 productivity; $n$ = 3,044 for all other cells; correlations with an absolute value greater than .03 are significant at the .05 level, per two-tailed tests.

[b] We used weights established by Statistics Canada to ensure that the sample did not overrepresent workplaces from a particular region or industry. We present weighted descriptive statistics.

[c] Logarithm.

sults for 2001 productivity, in Figure 1. As we expected, the slope of the regression line is negative for workplaces with high layoff rates and positive for workplaces with low layoff rates, supporting Hypothesis 1.

The explained variance from the interaction term ($\Delta R^2$ = .01) is comparable to that in other studies linking high-involvement work practices and productivity (e.g., Datta et al., 2005; Huselid, 1995). Additionally, the effect size in our study ($f^2$ = .01; see Cohen [1988] for calculations) is higher than those reported in much of the research on moderator effects: Aguinis, Beaty, Boik, and Pierce (2005) reviewed 30 years of management research on moderator effects and reported a median effect size ($f^2$) of .002. Although Aguinis et al. (2005) focused on categorical moderators, their research highlights the need for effect sizes to be interpreted within the context of a particular sample. Moreover, research indicates that even small amounts of variance can have meaningful and practical effects (Abelson, 1985; Aguinis, 2004; Aguinis et al., 2005; Fichman, 1999; Prentice & Miller, 1992). We can illustrate the impact of small amounts of variance by estimating the monetary impact on workplaces of higher layoff rates. We calculated 2001 productivity (in Canadian dollars) for workplaces with high and low layoff rates, with respect to a one-practice increase in 1999 high-involvement work practices. Holding all other variables at their mean, we found that workplaces with high layoff rates (one standard deviation above the sample mean) experienced a 17.2 percent decrease in productivity (approximately $4,617 per employee) for a one-practice increase. However, for workplaces with low layoff rates (one standard deviation below the sample mean), the model indicates that a one-practice increase in 1999 high-involvement work practices is associated with a 3.2 percent increase in 2001 productivity (approximately $1,304 per employee). Thus, our results have statistical and practical meaning.

Hypothesis 2 predicts that workplaces with continued investments in high-involvement work practices will reduce the negative moderating effect of higher layoff rates on the relationship between such practices and productivity. To test this prediction, we conducted a three-way interaction, in which we expected workplaces with high levels of high-involvement work practices in 1999 and 2001 (i.e., continued investments) to be more productive in high-layoff situations than workplaces with high levels in 1999 and low levels in 2001 (i.e., discontinued investments). The findings presented in step 4, Table 2, show that the three-way interaction among 1999 high-involvement work practices, layoff rates, and 2001 high-involvement work practices is positive and significant when regressed on 2001 productivity ($p < .001$, $\Delta R^2$ = .01, $f^2$ = .02) and 2002 productivity ($p < .05$). We can interpret these results as showing that the impact of layoff rates on the relationship between high-involvement work practices and productivity depends upon whether a workplace continues its invest-

**TABLE 2**
**Results of Hierarchical Regression Analyses for Productivity[a]**

| Variables | 2001 Productivity | | | | 2002 Productivity | | | |
|---|---|---|---|---|---|---|---|---|
| | Step 1 | Step 2 | Step 3 | Step 4 | Step 1 | Step 2 | Step 3 | Step 4 |
| Control variables[b] | | | | | | | | |
| Change in workplace size | −0.03** | −0.03** | −0.03** | −0.03** | −0.03† | −0.03† | −0.03† | −0.03* |
| 1999 productivity | 0.43** | 0.43** | 0.43** | 0.43** | 0.35* | 0.35* | 0.35* | 0.35* |
| 1999 downsizing | 0.00 | 0.00 | 0.00 | −0.00 | −0.01 | −0.01 | −0.01 | −0.01 |
| Union density | 0.00 | −0.00 | −0.00 | 0.00 | −0.01 | −0.01 | −0.01 | −0.01 |
| Workplace size | −0.01*** | −0.01*** | −0.01*** | −0.01*** | −0.01* | −0.01* | −0.01* | −0.01* |
| People strategy | 0.00 | −0.00 | 0.00 | 0.00 | −0.00 | −0.00 | −0.00 | −0.00 |
| Multisite operations | 0.01 | 0.01 | 0.01 | 0.01 | −0.00 | −0.00 | −0.00 | −0.00 |
| Workplace age | −0.00† | −0.00 | −0.00 | −0.00 | −0.00 | −0.00 | −0.00 | −0.00 |
| Independent variables | | | | | | | | |
| 1999 high-involvement work practices | −0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Layoff rate | −0.03 | −0.04* | −0.04* | −0.04* | −0.04† | −0.04* | −0.05* | −0.05** |
| 2001 high-involvement work practices | −0.00 | −0.00 | −0.00 | −0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Two-way interactions | | | | | | | | |
| 1999 high-involvement work practices × layoff rate | | −0.02† | −0.02† | −0.01 | | −0.03* | −0.03* | −0.02* |
| 1999 high-involvement work practices × 2001 high-involvement work practices | | | 0.00 | 0.00 | | | −0.00 | −0.00 |
| Layoff rate × 2001 high-involvement work practices | | | 0.00 | 0.01 | | | 0.00 | 0.01 |
| Three-way interaction | | | | | | | | |
| 1999 high-involvement work practices × layoff rate × 2001 high-involvement work practices | | | | 0.02*** | | | | 0.02* |
| $\Delta R^2$ | .21*** | .01*** | .00 | .01*** | .14*** | .01*** | .00 | .01*** |
| Total $R^2$ | .21*** | .22*** | .22*** | .24*** | .14*** | .16*** | .16*** | .16*** |

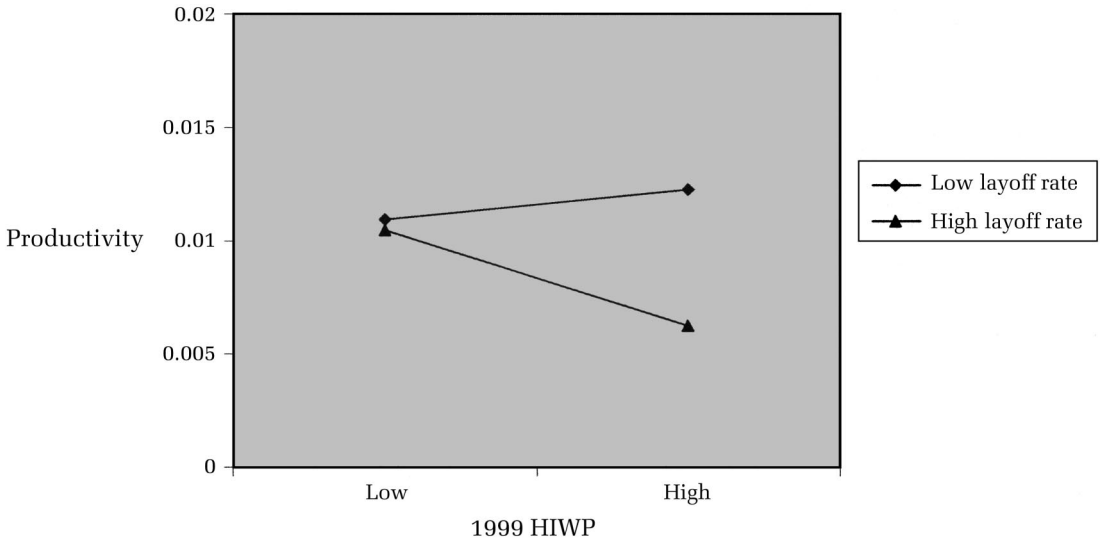
[a] $n$ = 3,044 for 2001 productivity models; $n$ = 2,942 for 2002 productivity models. All models include 2 dummies indicating year of layoffs and 12 industry dummies, which account for approximately .02 of the variance explained in both 2001 and 2002 productivity. Interaction effects are identical when industry and layoff dummies are omitted.

[b] All control variables are taken from 1999 survey, except for change in workplace size.

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$
Two-tailed tests.

ments in these practices (i.e., has a high level of 2001 high-involvement work practices). Following Aiken and West (1991), in Figures 2a and 2b we display the results graphically for the three-way interaction regressed on 2001 productivity, plotting one standard deviation above and below the mean for the second moderator (i.e., 2001 high-involvement work practices). When that variable has a low value (see Figure 2a), the relationship between 1999 high-involvement work practices and productivity is negative in workplaces with high layoff rates. The results of *t*-tests confirmed that the simple slope for workplaces having high layoff rates and low 2001 high-involvement work practices (i.e., discontinued investments) was negative and significant ($b = -.01$, $p < .001$). However, when 2001 high-involvement work practices are high (see Figure 2b), the relationship between 1999 high-involvement practices and productivity is positive in workplaces with high layoff rates (simple slope: $b = .003$, $p < .05$). In other words, workplaces that maintained high levels of high-involvement work practices in 1999 and 2001 (Figure 2b) mitigated the negative moderating effect of high layoff rates on the relationship between high-involvement work practices and productivity, but workplaces that discontinued investment (i.e., high levels in 1999 and low levels in 2001; see Figure 2a) incurred the negative effect. Finally, we graphed the results for 2002 productivity and found similar, but

**FIGURE 1**
**Effects of 1999 High-Involvement Work Practices and Layoff Rates on 2001 Productivity**




weaker, relationships. Overall, these findings support Hypothesis 2.

To obtain the three-way interaction results, we calculated the dollar change in 2001 productivity for workplaces having high layoff rates and continued investments in high-involvement work practices; the model indicates a 4.7 percent increase in productivity of approximately $745 per employee for a one-practice increase in 1999 high-involvement work practices. In contrast, workplaces having high layoff rates and discontinued investments in these practices experienced a 22.5 percent decline in productivity, or approximately $3,019 per employee for a one-practice increase over their 1999 level. These results indicate that continued investments in high-involvement work practices do lessen the negative effects of higher layoff rates on the relationship between such practices and productivity.

## DISCUSSION

Our first objective in this study was to gain understanding of the impact of layoffs on the relationship between high-involvement work practices and workplace productivity. We predicted that workplaces with more high-involvement work practices suffer greater negative effects from layoffs than workplaces with fewer such practices. The results provide support for the hypothesized interaction, suggesting that high-involvement workplaces threaten their competitive advantage through people when conducting layoffs. Our second objective was to understand how high-involvement workplaces could use layoffs, when necessary, without experiencing negative effects on productivity. Importantly, we found that workplaces with continued investments in high-involvement work practices mitigated the negative effects of layoffs on the relationship between the practices and productivity. We discuss the implications of our findings below.

We extend the resource-based view of the firm by considering how workplaces manage their workforce and HR practices. The complexity of the link between such management and productivity is evidenced by the presence of two- and three-way interactions but absence of main effects for high-involvement work practices. The dynamic capabilities framework helps explain these findings with the proposal that firms use a combination of high-involvement work practices and layoffs to remain flexible and responsive to their changing environments. Although layoffs may not be the first option for managing workforce capabilities, our results do suggest that layoffs may be tolerable within high-involvement workplaces, as long as investments in high-involvement work practices are continued during layoff periods. This finding is consistent with Lepak and Snell's (1999) contention that firms need to use multiple employment modes to capitalize on different market opportunities: As employee value and uniqueness change over time, so must an organization's employment strategies. Lepak and Snell (2002) found that firms simultaneously internalized employees who added both uniqueness and value and contracted out work for which employees no longer added market value. Our results indicate that layoffs are one mechanism that high-involvement workplaces may use to bal-

**FIGURE 2a**
**Effects of 1999 High-Involvement Work Practices and Layoff Rates on 2001 Productivity at Low Levels of 2001 High-Involvement Work Practices**

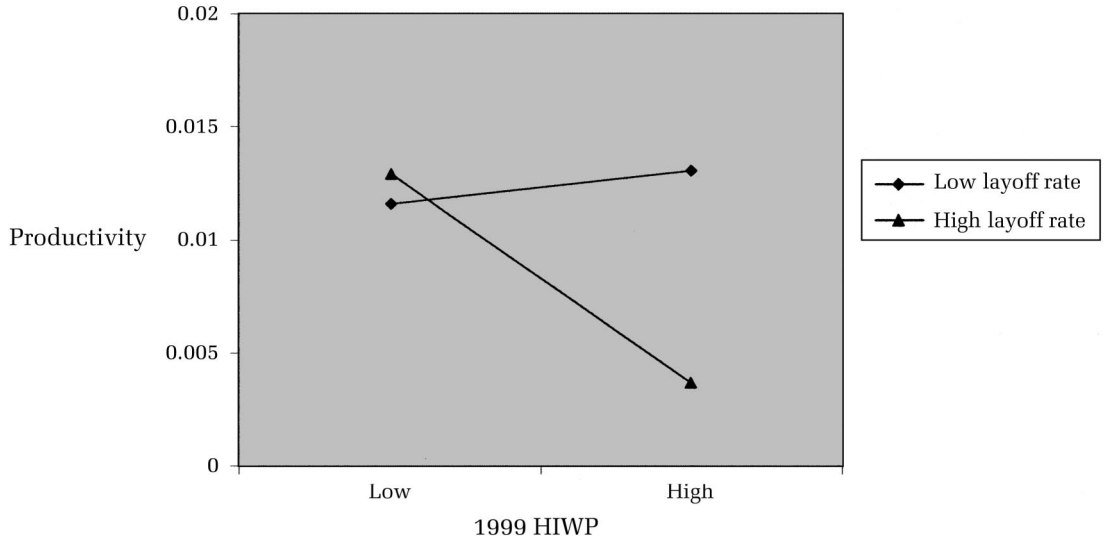
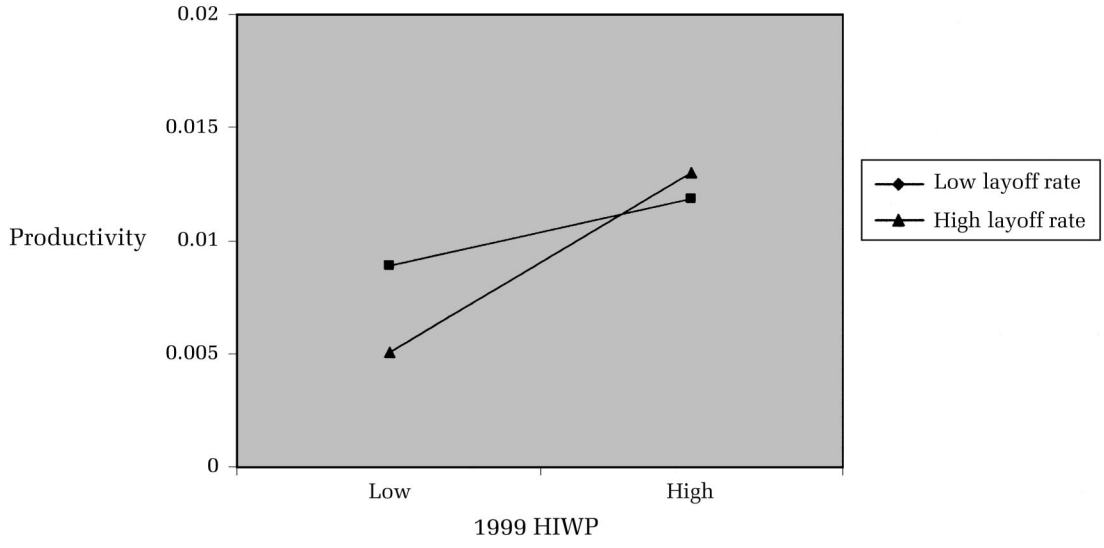



**FIGURE 2b**
**Effects of 1999 High-Involvement Work Practices and Layoff Rates on 2001 Productivity at High Levels of 2001 High-Involvement Work Practices**




ance multiple employment modes in response to market demands.

These findings are consistent with previous downsizing research, suggesting that layoffs are more successful when they are part of a strategic or planned change, rather than when they are part of cost-cutting by the workplace (Cameron, Freeman, & Mishra, 1993; Freeman, 1999; Worrell, Davidson, & Sharma, 1991). Although we could not verify workplace change strategy, it is likely that firms that maintain high levels of high-involvement work practices before and after layoffs are engaged in strategic reorientation but that firms reducing high-involvement work practices are not. Because layoffs breach the psychological contract between a workplace and its employees (Cascio & Wynn, 2004; De Meuse et al., 2004), it is essential for the workplace to avoid cutting high-involvement work practices during reorganization. When combined with layoffs, such cutbacks provide inconsistent messages to employees in a high-involvement workplace (Bowen & Ostroff, 2004). Rather, firms

must continue investments in employees, such as training and job enrichment, to accommodate new ways of operating (Brockner, 1992; Cascio & Wynn, 2004). This "reinvestment" is needed to prepare employees for future roles recognizing their value to the workplace.

Our study therefore also contributes to the growing research on employee-organization linkages (Shore & Coyle-Shapiro, 2003; Tsui et al., 1997; Whitener, 2001). Through additional economic and social exchanges, workplaces gain flexibility in the management of their workforces by investing in high-involvement work practices. Such investments help improve employees' skills, knowledge, experience, and marketability. In exchange, employees will continue to produce during periods of workforce reduction. Of course, future research is needed at the individual level to assess how employees view the trade-off between reduced job security and increased investment in their human capital.

Several important limitations of the present study merit discussion. First, the possibility of common method bias exists. However, this possibility was minimized by various factors in the research design, including the use of longitudinal data, whereby productivity was measured two and three years following the 1999 high-involvement work practices measure. Additionally, our dependent variable, productivity, was based on financial information provided by the respondents and was therefore less prone to the influence of implicit models held by respondents than subjective measures based on attitudes and perceptions (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). It is preferable for financial information to come directly from an independent, objective source, and it may be that the respondents did consult organization records or accounting personnel when completing the survey. Statistics Canada encouraged respondents to have financial personnel complete appropriate questions, particularly in larger workplaces with separate financial departments. Finally, it is possible that the primary respondents were different in each of the survey years; although specific information on the frequency of such variation was not available, Statistics Canada confirmed that it did occur for some workplaces. Thus, the presence of two-way and three-way interaction effects is not likely a result of common method bias.

Second, our use of dichotomous measures indicating the existence of a formal HR practice was a limitation. We could not assess the actual usage of high-involvement work practices, nor could we identify whether the practices were available to all employees or only to a subset. However, unlike many previous researchers using dichotomous measures, we did verify the decision to combine the practices into a single index using the Mokken Scaling Program, which allowed us to calculate a measure of reliability (rho), confirming the fit among the practices in our high-involvement work practices bundles. Additionally, as we discussed earlier, we did confirm that the presence of a bundle of HR practices was significantly related to the importance of employees in a workplace's business strategy—that is, it was likely to be a "people strategy."

A third limitation was the lack of measures of employee perceptions of high-involvement work practices and layoffs. Numerous studies have highlighted the negative employee perceptions associated with layoffs, but few have examined their role within a high-involvement workplace. There is a need for future research that assesses how employees view downsizing within the context of a high-involvement workplace, particularly with regard to the trade-off of job security for skills and training. Finally, we did not have information on high-involvement work practices during the period in which we measured layoffs (i.e., 2000). Instead, we inferred that workplaces with high levels of high-involvement work practices in 1999 and 2001 maintained the practices in 2000. Future research should address the possibility that high-involvement work practices fluctuate year-to-year, as well as the consequences of such fluctuations on employee capabilities and workplace productivity.

It is also essential to consider whether our focus on Canadian workplaces limits the generalizability of our findings. Geographical context may be important, as Canada has a bigger "safety net" than some other countries. For instance, Canadian law requires severance pay commensurate with an individual's length of service (called "reasonable notice"). Additionally, Canada guarantees basic health care for residents, which minimizes some of the pain of unemployment. This safety net may make it possible for high-involvement workplaces to "justify" the decision to lay off employees. Thus, future research is required to verify that our findings are generalizable to other countries, particularly in countries such as the United States, where the safety net is more limited than Canada's and termination benefits are thus more important (e.g., Chadwick et al., 2004).

These limitations are inherent in using data collected as part of large government surveys (Godard, 2001). Yet use of these data to test our hypotheses had many strengths. First, we had longitudinal data with which to test the relationship between high-involvement work practices and workplace perfor-

mance. Typically, research has relied on retrospective questions or contemporaneous data to link HR practices to performance (Wright et al., 2003). Second, the data represented a nationally representative stratified sample of workplaces in Canada, a fact that reduced biases from workplaces being selected or omitted from the sample. Finally, we were able to measure high-involvement work practices at two points in time, a rarity in similar research.

Understanding the relationship between high-involvement work practices and layoffs is essential for HR managers. Layoffs have become an accepted business practice and are viewed as an important tool with which management guides organizations through changing business environments (McKinley et al., 2000). Yet evidence to indicate that layoffs do not improve performance continues to mount. We extend this finding to include workplaces that have made investments in firm-specific human capital. Prior investments in high-involvement work practices do not continue to motivate employees to remain productive. Rather, management must continue to invest in high-involvement work practices during downsizing. Our results mirror the observation by Pfeffer that "even for firms [needing] to reduce the number of employees, downsizing can be accomplished while still treating people as important assets and maintaining morale and trust" (1998: 186) and, therefore, maintaining productivity.

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