

THROUGH THE LOOKING GLASS OF A SOCIAL SYSTEM: CROSS-LEVEL EFFECTS OF HIGH-PERFORMANCE WORK SYSTEMS ON EMPLOYEES' ATTITUDES

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Drawing on emerging multilevel theorizing in human resources management, we tested a multilevel model of high-performance work systems (HPWS), using data obtained from 324 managers and 522 employees in 76 Japanese establishments. Results from cross-level analyses indicated that the relationships between establishment-level HPWS and employee job satisfaction and affective commitment were fully mediated by establishment-level concern for employees climate. These results shed new light on the mechanisms through which HPWS impacts employee outcomes and serve to bridge between macro and micro perspectives of human resource management. The research and practice implications of the findings are discussed.

High demand and competition for employee and managerial talent has led to increasing interest in understanding the potential benefits of using high-performance work systems (HPWS) as a means to maximize firms' competitive advantage (e.g., Guthrie, 2001; Huselid, 1995; Sun, Aryee, & Law, 2007). HPWS refer to a group of separate but interconnected HR management practices, including comprehensive recruitment and selection procedures, incentive compensation and performance management systems, and extensive employee involvement and training, which are designed to enhance employee and firm performance outcomes through improving workforce competence, attitudes, and motivation (Huselid, 1995). Research has shown that HPWS can help companies leverage their human capital toward improving firm performance (Arthur, 1994; Combs, Liu, Hall, & Ketchen, 2006; Datta, Guthrie, & Wright, 2005; Guthrie, 2001).

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Indeed, Collins and Smith (2006, p. 545) suggest that HR systems “affect firm performance by creating an organizational environment that elicits employee behaviors and capabilities that contribute to firm competitive advantage.”

Building on this evidence, the field of strategic HRM research has increasingly recognized the role of employees in the HRM practices-firm performance relationship. In line with sociotechnical views of organizations (Trist & Bamforth, 1951), several scholars have proposed that the HRM technical system, consisting of HRM strategies and practices, influences organizational outcomes through various social mechanisms, such as climate, social exchanges, and employee attitudes and behaviors (e.g., Collins & Smith, 2006; Delery & Shaw, 2001; Evans & Davis, 2005; Ostroff & Bowen, 2000). However, the assumption that *HRM* systems impact employees’ attitudes and behaviors, as well as firm performance, through various social processes has remained largely untested.¹ With few exceptions, research to date has not empirically examined the social mechanisms through which HPWS influence its proposed outcomes, such as firm performance (e.g., Sun et al., 2007; Takeuchi, Lepak, Wang, & Takeuchi, 2007) and individual-level attitudes (Whitener, 2001). Indeed, reviews by Lepak, Liao, Chung, and Harden (2006) and Wright and Boswell (2002) have noted the paucity in multilevel research that integrates between macro concepts such as HPWS and more micro HR-related processes and outcomes. Thus, we still have very little empirical evidence in support of the mechanisms through which HPWS influence outcomes in organizations and the theorized cross-level influences of HPWS on employee attitudes and motivation.

Accordingly, we argue that adopting a multilevel theoretical perspective, which considers aspects of the organization’s social system, is needed to fully understand how HRM systems relate to employee attitudes and behaviors. Our research focuses on HPWS and climate that exist in establishments, defined as a stand-alone entity with a business address but distinct from a company (Osterman, 1994), given that different HR systems can be implemented across establishments belonging to a single firm (Ichniowski, Shaw, & Prennushi, 1997). We study two employee job attitudes—job satisfaction (i.e., one’s overall satisfaction with one’s job; Judge, Thoresen, Bono, & Patton, 2001) and affective commitment (i.e., one’s emotional attachment to and psychological identification with the organization; Allen & Meyer, 1990)—that have been linked to important outcomes such as productive and counterproductive performance and turnover. Building on

¹This statement applies to studies on strategic HRM where scholars focus on a system of HR practices. There are studies that had examined the relationship between more specific set of HR practices and climate, for example (cf. Kopelman, Brief, & Guzzo, 1990).

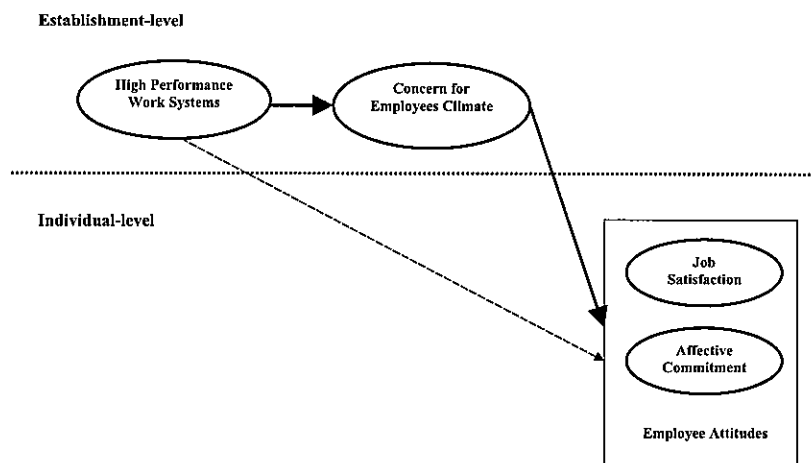


Figure 1: Multilevel Model of High Performance Work Systems, Climate, and Individual-Level Attitudes.

social information processing theory (Salancik & Pfeffer, 1978) and organizational climate research, we also examine whether concern for employees climate (Burke, Borucki, & Hurley, 1992)—which we argue below reflects an important social mechanism—helps explain how HPWS relate to employee attitudes. Thus, the key purpose of this research is to provide an initial examination of the cross-level linkages between establishment-level HPWS and employee-level outcomes, as mediated by establishment-level climate. The conceptual model tested in this research is summarized in Figure 1.

Our primary contribution involves the amalgamation of research on HPWS, organizational climate, and employee attitudes, which provides a more explicit integration of micro and macro views of the management of human resources in work organizations. As noted by several authors (Ostroff & Bowen, 2000; Ployhart, 2004; Wright & Boswell, 2002), HRM research has progressed on two parallel tracks—micro (with its focus on enhancing individual-level productivity, attitudes, well-being, and retention) and macro (with its focus on firm-level HR strategies, functions, and practices). Integration between macro and micro HRM has been lacking, leading to insufficient understanding of whether and how strategic HRM might impact individual-level outcomes. Thus, this research seeks to enhance our understanding of the complex, multilevel pathways through which an important strategic HRM concept (HPWS) influences important individual outcomes in organizations.

Conceptual Background and Hypotheses

Strategic HRM is defined as “the pattern of planned human resource deployments and activities intended to enable an organization to achieve its goals” (Wright & McMahan, 1992, p. 298). As such, strategic HRM adopts a systems view to examine the effects of a bundle of HR practices (Wright & McMahan, 1992), which differentiates strategic HRM studies from more traditional functional views of HR. Within the strategic HRM literature, the concept of HPWS has emerged as a core construct encompassing the extent to which firms invest in the attraction, selection, management, and retention of the best possible human capital (Huselid, 1995; Lepak et al., 2006; Lepak & Snell, 2002). That is, HPWS are indicative of the value firms place on their human capital as a source for competitive advantage, with higher HPWS levels indicative of greater value firms place in their human capital.

Although HPWS have been proposed to influence employee motivation and attitudes, little research has actually tested this proposition. The behavioral perspective of the firm (Jackson, Schuler, & Rivero, 1989) provides a backdrop for examining the mediating mechanisms through which HPWS impact outcomes. According to this perspective, firms rely on HR practices, such as HPWS, to elicit and control certain employee role behaviors and attitudes (Jackson et al., 1989). However, the relationships between HPWS and employee-level outcomes may not be direct. Rather, Bowen and Ostroff (2004) and Ostroff and Bowen (2000) proposed that organizational climate serves as a key mediating mechanism linking HRM systems to individual-level outcomes. Unfortunately, the question of whether climate mediates HR system’s influences on employee-level outcomes has been largely ignored in empirical strategic HRM research (Combs et al., 2006; Evans & Davis, 2005; Ostroff, Kinicki, & Tamkins, 2003).

HPWS and Concern for Employees Climate

Organizational climate is defined as “the shared perceptions of employees concerning the practices, procedures, and kinds of behaviors that get rewarded and supported in a particular setting” (Schneider, White, & Paul, 1998, p. 151). According to Zohar (2000), climate captures employees’ perceptions regarding how formal organizational policies and procedures are practiced or implemented in their organization. In other words, organizational climate reflects employee perceptions of what is important and what behaviors are expected and rewarded in the organization (e.g., Bowen & Ostroff, 2004). The climate literature has distinguished between organizational climate, which is shared among members

of a work or organizational unit, and individual (psychological) climate, which can differ across members of the same unit (Chan, 1998; James & James, 1989). Although individuals may hold different perceptions of psychological climate, several authors have argued that climate perceptions are likely to be more similar within work units than between work units. Shared climate perceptions likely develop in work units in part due to ambient social and structural stimuli operating on all members of the same unit (e.g., exposure to similar norms, leadership, and HR practices) and in part due to attraction-selection-attrition processes that can lead to homogeneity in values and perceptions in work organizations (Borucki & Burke, 1999; Chan, 1998; Ostroff et al., 2003; Schneider & Bowen, 1985). Climate scholars have also differentiated between climates for specific targets, such as safety (e.g., Zohar, 2000), service (e.g., Schneider et al., 1998), or empowerment (e.g., Seibert, Silver, & Randolph, 2004), as well as global or generalized climate perceptions (e.g., Burke et al., 1992; James & James, 1989).

Because our focus is on how climate mediates between a broad system of HRM practices (HPWS), which applies to all members of an establishment, and employee job attitudes, we focus on shared generalized organizational climate. Specifically, we examine concern for employees climate, which, similarly to James and James's (1989) notion of general psychological climate, represents individual employee's cognitive appraisals of the extent to which the organizations values and cares about its employees' well-being (Burke et al., 1992). According to Burke et al. (1992), concern for employees climate includes six dimensions: goal emphasis, management support, nonmonetary reward orientation, monetary reward orientation, work group cooperation, and means emphasis. Concern for employees climate is similar to the notion of organization care, which, building on organizational support theory, McAllister and Bigley (2002, p. 895) defined as "an organization-level and organization-centered phenomenon reflecting perceptions regarding the broad provision of care by the organization to all employees." Employees in the same establishment likely share perceptions of concern for employees' climate because they are exposed to similar stimuli and experiences that inform them of how employees are treated by their organization, such as HRM practices. Indeed, Borucki and Burke (1999) found evidence that concern for employees climate emerged as a shared, establishment-level climate in their study of service providers in retail stores.

We propose that establishments' HPWS positively impact employees' shared perceptions of concern for employees' climate, or shared beliefs regarding the extent to which an establishment supports and cares about its employees. According to Ostroff and Bowen (2000), climate serves as an important linking mechanism between HRM practices and employee attitudes. In line with social information processing theory (Salancik &

Pfeffer, 1978) and prior theories of organizational climate (e.g., Kopelman et al., 1990; McGregor, 1960), Bowen and Ostroff (2004, p. 204) proposed further that “features of an HRM system . . . send signals to employees that allow them to understand the desired and appropriate responses and form a collective sense of what is expected.” Following this rationale, we argue that HPWS involve a set of HR practices that signal employees that their establishment values, cares about, and supports its employees. For example, rigorous and selective staffing within HPWS signifies that the establishment cares about the quality of the employees it hires (e.g., Huselid, 1995). Similarly, compensation programs such as incentive plans, profit-sharing plans, or gain-sharing plans, as well as developmental and merit-based performance appraisal and strong emphasis on flexible work assignments (e.g., job rotation) are collectively indicative that the establishment focuses on motivating and developing its employees (cf. Burke et al., 1992). Further, Sun et al. (2007, p. 561) assert that “extensive skills training foster the perception of the work environment as being supportive.” Such high-performance HRM practices are more visible in establishments than organizations, given their smaller size, and hence are especially likely to influence concern for employees’ climate at that level. As such, we predict:

Hypothesis 1: Establishment-level HPWS are positively related to establishment-level concern for employees’ climate.

The Mediating Role of Concern for Employees Climate

As indicated above, conceptualizations of HPWS assume that such systems include a set of practices that influence employee motivation and attitudes (Huselid, 1995). Yet, research to date has not actually tested whether HPWS predict employee attitudes. In this study, we examine the cross-level linkages between establishment-level HPWS and employees’ job satisfaction and affective commitment, and propose that establishment-level concern for employees’ climate mediates these linkages. There is ample evidence that job satisfaction and affective commitment promote a host of positive individual-level behavioral and performance outcomes (e.g., Judge et al., 2001; Mathieu & Zajac, 1990), as well as unit-level performance outcomes (e.g., Ostroff, 1992; Ryan, Schmit, & Johnson, 1996). As such, understanding whether and how HPWS lead to employees’ job satisfaction and affective commitment is important, as it can help shed more light on the multilevel mechanisms through which HPWS impact organizational outcomes.

We expect that establishment-level HPWS and concern for employees climate have cross-level influences on individual job attitudes—that is, these establishment-level predictors are expected to account for

between-establishment differences in average levels of employees' job attitudes. This requires that job attitudes vary not just between individuals (i.e., within establishments) but also between establishments, and that HPWS and concern for employees climate explain establishment-level variability in job attitudes (see Bliese, 2002). Note, however, that average levels of job attitudes in establishments (or establishment-level variance in job attitudes) do not necessarily represent establishment-level constructs; rather, they represent establishment-level differences in individual-level phenomena that are amenable to establishment-level influences (cf. Kozlowski & Klein, 2000). Indeed, the evidence noted above that job attitudes relate significantly to both individual-level and unit-level outcomes provides some support that job attitudes can vary meaningfully across levels (cf. Chen, Mathieu, & Bliese, 2004). Research by Ostroff (1992, 1993) has shown further that (a) job satisfaction and affective commitment vary significantly both within and between organizational units, and that (b) differences in job attitudes are explained by both individual-level and unit-level predictors. Thus, although job satisfaction and affective commitment reflect individual experiences, they are likely to be affected by attributes of both the individuals and the context in which individuals operate. Therefore, the cross-level effects we examine consider the extent to which individual-level job satisfaction and affective commitment vary between establishments as a function of establishment-level HPWS and concern for employees' climate.

Social information processing theory and the organizational climate literature further support our expectation that the cross-level impact of HPWS on individual job attitudes is mediated by concern for employees' climate. According to social information processing theory (Salancik & Pfeffer, 1978, p. 227), the social environment in which individuals operate influences individual attitudes in organization because the social environment "provides a direct construction of meaning through guides to socially acceptable beliefs, attitudes, and needs, and acceptable reasons for action." The organizational climate literature suggests that climate is a particularly powerful social mechanism through which HRM practices impact individual attitudes because climate shapes how employees construe the meaning of organizational practices (Burke et al., 1992; Ferris et al., 1998; Ostroff & Bowen, 2000; Ostroff et al., 2003). In line with these arguments, HPWS likely influence employee job satisfaction and affective commitment because they lead to a more positive concern for employees' climate in establishments. Specifically, in the globally shared climate created by HPWS, employees likely view their establishment as caring about its employees' success and well-being (Borucki & Burke, 1999; McAllister & Bigley, 2002), and hence are more satisfied with their jobs and more committed to their organization. Thus, concern for

employees' climate provides the lens through which HPWS promote employees' job satisfaction and affective commitment.

The climate literature provides empirical support for the relationship between concern for employees climate and employee attitudes. As reviewed by Ostroff et al. (2003), researchers found relationships between climate and individual job attitudes. Research by James and James (1989), for example, detected a strong positive link between general psychological climate (at the individual-level) and employee job satisfaction. Moreover, Schulte, Ostroff, and Kinicki (2006) found that organizational-level climate can have unique cross-level influence on individual job satisfaction when also taking into account the influence of individual-level, psychological climate. Thus, although we are not aware of research examining whether concern for employees climate mediates between HPWS and job attitudes, the theoretical rationale and empirical evidence above suggest that concern for employees climate is more proximal to individual job attitudes than HPWS and, further, that concern for employees climate can mediate between HPWS and employees' job attitudes. Therefore, we expect the following:

Hypothesis 2: Establishment-level concern for employees' climate mediates the positive cross-level relationship between establishment-level HPWS and average levels of individual job satisfaction in establishments.

Hypothesis 3: Establishment-level concern for employees' climate mediates the positive cross-level relationship between establishment-level HPWS and average levels of individual affective commitment in establishments.

Method

Sample, Design, and Procedure

As part of a larger research project,² we approached establishments from 120 Japanese companies. Gerhart, Wright, McMahan, and Snell (2000) noted that establishment-level surveys may be more reliable than

²Takeuchi et al. (2007) relied on data from the same sample. However, the only overlapping variable across the two studies is HPWS. Moreover, Takeuchi et al. (2007) focused on different substantive relationships (establishment-level relationships between HPWS and performance) and different theories than the present paper. In auxiliary analyses reported in the Results section, we also demonstrate empirically that other mediators from Takeuchi et al.'s paper—human capital and social exchanges—were less relevant to explaining individual level job attitudes than was concern for employees climate. Thus, the two papers are substantively and empirically distinct.

corporate-level surveys because the managers are likely to be more familiar with the HR practices that are being implemented at their establishment due to a smaller size (see also Batt, 2002). Given concerns related to single-rater biases in strategic HRM research (Gerhart et al., 2000), we sought to collect data from multiple managers and multiple employees within each establishment. The original population consisted of a convenience sample of Japanese companies with which a Japanese faculty member on the research team had a personal connection. Although convenience sampling can yield less representative samples, relying on personal contacts helped ensure higher response rates in the sample. Also, care was taken to select companies that are somewhat representative of various industry sectors.

Once the consent of the top management of each participating company had been secured, HR managers were asked to arrange site visits, during which we provided surveys to managers and employees at each establishment. All managers and employees were white-collar, full-time, permanent employees. We focused on white-collar managers and staff because they are particularly likely to be exposed to, and hence be familiar with, HPWS in Japanese establishments. Survey responses were returned to the research team using prepaid and self-addressed envelopes. In the cover letter to the survey, the purpose of the project and the voluntary nature of participation were described. Respondents were assured of the anonymity of their responses and the opportunity to receive feedback. To maximize response rate, our contacts in the companies were contacted by phone and/or e-mail 2 weeks after the initial distribution of the survey. A second round of follow-ups was conducted by mail, enclosing another set of surveys. This was reinforced again by phone calls and/or e-mails to all potential respondents. A final round of contact/communication was conducted by mail, again enclosing a survey packet. There was no incentive (cash or otherwise) for participating in this project.

Of the 120 companies approached, 56 agreed to participate (47% response rate). The final sample for this study consisted of 76 business establishments from 56 different companies located in Japan, covering a range of industries and geographical regions, including 33 establishments from manufacturing; 4 from construction; 7 from the transportation, communication, electric, gas, and sanitary services sectors; 7 from wholesale trade; 5 from retail trade; 6 from finance, insurance, and real estate; and 14 others; mean establishment size was 385 ($SD = 639$, range = 7 to 4056). Each of the 76 establishments provided usable responses from at least one manager and two employees, which we deemed necessary to ensure multiple data sources for each establishment.³ The managerial sample

³In order to alleviate concerns related with the number of employee responses relative to establishment size, we conducted auxiliary analyses that are detailed below.

consisted of 324 managers (average per unit was 4, with a range of 1 to 26; there were 23 units from which only one managerial response was obtained). The managers, on average, had 19 years of work experience at the establishment ($SD = 12$), 10 years of job tenure ($SD = 10$), were 48 years old ($SD = 7.91$), were predominantly male (96%), and majority were at the levels of middle management (36.8%) or supervisors (36.5%). For the employee sample, the total number of respondents was 522 with an average of 7 responses per unit (ranging between 2 and 48). The employees, on average, had 8 years of work experience at the establishment ($SD = 8.12$), 6 years of job tenure ($SD = 6.46$), were 36 years old ($SD = 8.43$), were predominantly male (81%), and were employed full-time (90%).

Measures

We followed the procedures recommended by Brislin (1990) for survey translations across different languages. First, the primary author who is fluent in Japanese created and translated the English survey items into Japanese. Second, the primary author and another Japanese faculty member in human resource management who is proficient in English improved the translation through iterative processes where any concerns or discrepancies between the English and Japanese versions were detected and addressed. To validate the survey translation, two Japanese employees not affiliated with this study read through the Japanese version to test its readability and ease of comprehension. Any concerns were noted and addressed. As a final check, a third Japanese native translated the survey back into English, and the Japanese and English versions were compared for any discrepancies; none were detected.

The importance and difficulty of developing appropriate systems of measurement across cultures has been generally recognized (e.g., Brislin, 1990; Lonner, 1990). With this in mind, extra care was taken to ensure that the selected items were phrased in language that would be familiar and meaningful for the Japanese employees (Lonner, 1990). In addition, due to response rate consideration, several measures had to be shortened to keep the survey length to a minimum. In shortening the scales, we attempted to include items that (a) loaded well on their factors in prior research, and (b) translated especially well to the Japanese context. Unless otherwise noted, scales were scored using a 7-point Likert-type anchors ranging from 1 = *strongly disagree* to 7 = *strongly agree*.

High-performance work systems (aggregate, establishment-level). Managers completed the 13-item HPWS scale developed by Huselid (1995). Given that we were interested in the HR practices used in the establishment, the instruction specifically stated: "Please provide your best estimate of the percentage of employees covered by the following

HR practices for the establishment. When answering this section, please think about those HR practices used for the employees in your establishment!" Thus, the items asked the managers about establishment-level HR practices; for example, "What is the extent of the workforce that uses performance appraisals to determine their compensation?" (1 = *not at all*, 2 = *minimally*, 3 = *not too much*, 4 = *not much*, 5 = *somewhat extensively*, 6 = *moderately extensively*, 7 = *very extensively*). Coefficient alpha for the HPWS scale was .83, indicating that items were internally consistent. Furthermore, this 13-item HPWS scale correlated significantly ($r = .42, p < .001$) with an alternative 21-item HPWS measure obtained from employees, which was adapted from Lepak and Snell (2002) to fit the Japanese context. This indicates good convergent validity for Huselid's HPWS scale and provides evidence the scale is adequate in a Japanese context. For this study, we relied on managers' ratings of Huselid's HPWS scale to reduce common-method biases because all other measures were collected from employees.

Concern for employees climate (aggregate, establishment-level). Similar to Eisenberger, Armeli, Rexwinkel, Lynch, and Rhoades (2001), we selected six high loading items from Eisenberger, Hungtinton, Hutchison, and Sowa (1986), which reflect the management support and reward orientation aspects of concern for employees (psychological) climate (Burke et al., 1992). In particular, concern for employees climate was measured by the following six items: "The establishment values our contribution to its well-being," "If the establishment could hire someone to replace us at a lower salary it would do so" (reverse coded), "The establishment fails to appreciate any extra effort from us" (reverse coded), "The establishment would ignore any complaints from us" (reverse coded), "The establishment disregards our best interests when it makes decisions that affect us" (reverse coded), and "Help is available from our establishment when we have a problem."

As in McAllister and Bigley (2002), these items were reworded such that the establishment, as opposed to the individual employee, was the focal referent in all items (i.e., the adapted measure reflected a referent-shift consensus model; Chan, 1998). We used "establishments" as the target of climate items for a couple of reasons. First, this matches the target of HPWS (i.e., establishments) we used in this study, which follows the suggestion by Gerhart et al. (2000). Second, Dietz, Pugh, and Wiley (2004), among others, showed that climate perceptions targeted at the branch-level (i.e., establishments) were stronger predictors of important outcomes than that targeted at the organizational-level. Cronbach's alpha for this six-item scale was .80.

Job satisfaction (individual-level). Employees' overall job satisfaction was measured by three items from Cammann, Fichman, Jenkins, and

Klesh (1979): "All in all, I am satisfied with my job," "In general, I like working here," and "All things considered, I am satisfied with my current job," with a coefficient alpha of .93.

Affective commitment (individual-level). Employees' affective commitment to the organization was measured by three items from Allen and Meyer (1990): "This organization has a great deal of personal meaning for me," "I feel like "part of the family" at my organization," and "I feel 'emotionally attached' to this organization," with a coefficient alpha of .85.

Control variables. Given that we obtained responses from multiple establishments in 3 of the 56 companies, we created three dummy coded variables to control for potential systematic effects of the firms (Company Dummy 1 with 13 establishment responses, Company Dummy 2 with 4 establishment responses, and Company Dummy 3 with 4 establishment responses). The rest of the companies provided responses from a single establishment. As industry characteristics have been shown to have an impact in strategic HRM (e.g., Datta et al., 2005), we also included six industry dummies at a level equivalent to single digit SIC code ([1] Construction; [2] Manufacturing; [3] Transportation, Communication, Electric, Gas, Sanitary Services; [4] Wholesale Trade; [5] Retail Trade; and [6] Finance, Insurance, Real Estate). The company and industry dummies helped us tease out establishment-level effects from potential firm- and industry-level effects. In addition, we controlled for establishment size (using a natural log transformation, due to its highly skewed distribution), given HR practices (e.g., Datta et al., 2005; Guthrie, 2001) and concern for employees climate (e.g., Dietz et al., 2004) may vary as a function of establishment size. We also controlled for percentage of employee responses obtained for each establishment, to remove possible influences of differences in response rates across establishments. Furthermore, at the individual-level, we controlled for employee age, gender, education level, and organizational tenure because these variables were found to be related to job attitudes or relationships involving job attitudes (e.g., Judge et al., 2001; Mathieu & Zajac, 1990).

Confirmatory Factor Analyses and Aggregation Tests

To further validate the measures, we first conducted confirmatory factor (CFA) analyses in LISREL on the three substantive measures obtained from employees, including organizational climate of concern for employees, job satisfaction, and affective commitment. We did not include manager-rated HPWS in these analyses because they were only available at the manager- (or establishment-) level. The measurement models examined in LISREL were based on all 12-items capturing the three

constructs. Results indicated that the hypothesized, three-factor measurement model fit the data well, χ^2 ($df = 51$) = 308.65, SRMR = .07, CFI = .96. We also contrasted this three-factor model against more constrained models, which set the job satisfaction and affective commitment factors to correlate 1.0. The alternative model fit the data significantly worse than the hypothesized model $\Delta\chi^2$ ($\Delta df = 1$) = 626.36, $p < .05$, SRMR = .10, CFI = .90, supporting the discriminant validity of measures obtained from employees.

We also conducted CFA on the two establishment-level variables (i.e., HPWS and concern for employees' climate). Due to the small sample size ($N = 76$), we created three parcels for each scale. This two-factor model fit the data well, χ^2 ($df = 9$) = 63.87, SRMR = .06, CFI = .98. The fit of the model in which two factors were set to correlate at 1.0 (i.e., single-factor model) did not fit the model well, χ^2 ($df = 9$) = 63.87; SRMR = .17, CFI = .58, and it fit significantly worse than the freely estimated model, $\Delta\chi^2$ ($\Delta df = 1$) = 54.29, $p < .05$. These results indicate that the variables included in this study are sufficiently distinct from each other.

To support the aggregation of HPWS and concern for employees climate measures to the establishment level, we examined four aggregation statistics: two interrater agreement indices ($R_{wg(j)}$: James, Demaree, & Wolf, 1984; and AD_m : Burke & Dunlap, 2002; Burke, Finkelstein, & Dusig, 1999) and two interrater reliability indices (ICC1 and ICC2: Bliese, 2000). To calculate $R_{wg(j)}$, we used a uniform null distribution because we did not expect specific response pattern, such as skewed distributions; and, in fact, individual responses of the HPWS and climate measures ranged from 1 to 7, and the means of these scales did not suggest much of a skew (4.68 and 3.98 on a 7-point scale, respectively). The mean $R_{wg(j)}$ was 0.97 (ranged between .69 and .99) for the 13-item HPWS scale and was 0.92 (ranged between .25 and .97) for the 6-item climate measures. The average deviation from the mean ($AD_{M(j)}$: Burke et al., 1999) for HPWS (for 53 units with more than 2 managerial responses) and climate (for all 76 units) scale were 0.41 and 0.54, respectively. Both values are well below the suggested standard of $c/6$ (the number of response options for an item [c] divided by six, which is $7/6 \cong 1.17$ in our case) as an upper-limit cutoff for the AD index (Burke & Dunlap, 2002), suggesting sufficient level of agreement. In fact, only one establishment (out of 76) exceeded this value (1.20) for climate (and none for HPWS). The ICC(1) values for HPWS and climate were 0.22, and 0.18, respectively. The ICC(2) values for the same set of variables were 0.55 and 0.61, respectively. The F -tests associated with all ICC values were statistically significant, $p < .05$. Note that these values are comparable to other multilevel studies (e.g., Chen, Kirkman, Kanfer, Allen, & Rosen, 2007; Liao & Chuang, 2004; Zohar & Luria, 2005). Thus, these statistics support the

aggregation of the variables to the establishment level, as they suggest ratings were highly shared within establishments and reliably different across establishments (Bliese, 2000).

Analyses Strategy

Recall that Hypothesis 1 considers the establishment-level relationship between HPWS and concern for employees' climate, whereas the remaining hypotheses (Hypotheses 2 and 3) involve cross-level relationships between constructs residing at the establishment and individual levels of analysis. Hypothesis 1 was tested using OLS regression because it involved only establishment-level variables. Following Bliese's (2002) recommendations, the hypotheses involving cross-level relationships were tested using random coefficient model (RCM; also termed hierarchical linear modeling) analyses with Version 3.0 of the nonlinear and linear mixed effects (NLME) program for S-PLUS and R (Pinheiro & Bates, 2000). RCM appropriately partitions individual-level outcomes into within-establishment and between-establishment variance, and then regresses the within-establishment variance on individual-level predictors (individual-level controls in our study) and the between-establishment variance on establishment-level predictors (establishment-level controls, HPWS, and climate in our study). Effects of establishment-level predictors on the between-establishment portion of individual outcomes reflect "cross-level effects" (Bliese, 2002).

Note that, although cross-level effects model the between-establishment portion of the dependent variable, they are distinct from establishment-level analyses. First, cross-level tests weight the influences of establishment-level predictors on the outcomes by the number of responses within the unit (i.e., units with more responses are more influential in the estimation; Bliese, 2002). Second, unlike establishment-level effects, cross-level effects can partial out potential influences of individual-level predictors on the dependent variable, which could affect the total variance in the dependent variable and, hence, the impact of establishment-level predictors on the outcome (cf. Chen & Bliese, 2002).

To establish cross-level mediation, we used RCM in conjunction with recommended steps to test mediation by Kenny, Kashy, and Bolger (1998) (see also Chen & Bliese, 2002). According to Kenny et al., mediation is supported when the following conditions are met: (a) the independent variable (HPWS) predicts the dependent variables (individual attitudes), (b) the independent variable predicts the mediator (climate), and, when regressing the dependent variables on both the independent variable and the mediator, (c) the mediator significantly predicts the dependent variable, whereas (d) the independent variable no longer predicts the dependent

variable. We also conducted the Sobel (1982) test to examine whether the indirect effect of the independent variable (i.e., HPWS) on the dependent variables (i.e., individual outcomes) via the mediator (i.e., climate) is significantly different from zero. In effect, Sobel's test examines whether the estimate associated with the influence of the independent variable on the dependent variable drops significantly once introducing the mediator.

In hypotheses tests, we controlled for industry and company dummies, establishment size (natural log), and percentage of responses obtained at the establishment level (i.e., Level 2), and for employee age, gender, educational level, and organizational tenure at the individual level (i.e., Level 1). In RCM tests, we report the unstandardized parameter estimates, standard errors, and their statistical significance, as well as the variance explained for by both Level-1 (individual-level) and Level-2 (establishment-level) predictors (see Bliese, 2002). Note, however, that the variance explained estimates are "Pseudo R^2 " values that can be unstable and either under- or overestimate the true effect sizes (Snijders & Bosker, 1999). Therefore, we also report the total R^2 value for each model, obtained from cross-level operator tests in regression (James & Williams, 2000), reflecting the total variance of the dependent variable explained by the models.

Results

Table 1 shows the descriptive statistics, including the means, standard deviations, correlations, and internal consistency reliabilities for this study. Prior to testing the hypotheses, we examined the extent to which job attitudes varied between establishment, as indicated by ICC(1). For job satisfaction, ICC(1) was .08, $F_{(75,446)} = 1.62$, $p < .05$, indicating that 8% of the total variance in job satisfaction resided between establishments. For affective commitment, ICC(1) was also .08, $F_{(75,446)} = 1.60$, $p < .05$, indicating that, for affective commitment, 8% of the total variance resided between establishments. These results indicated there was significant establishment-level variance in both job attitudes, which means establishment-level HPWS and concern for employees climate could explain between-establishment variance in job attitudes (Bliese, 2002).

Hypothesis 1 proposed a positive relationship between establishment-level HPWS and concern for employees' climate. Table 2 summarizes the ordinary least square regression tests of Hypothesis 1. As shown in Table 2, HPWS explained 7% additional variance in concern for employees climate over and above those explained by the set of 11 control variables included in the first step. The parameter estimates associated with HPWS was positive and significant (.34, $p < .05$), which provides support for Hypothesis 1. Note that support for Hypothesis 1 also meets one of

TABLE 1
Descriptive Statistics, Reliability Coefficients, and Correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Industry Dummy 1 ^a	0.16	0.36																			
2. Industry Dummy 2 ^a	0.34	0.48	-.31***																		
3. Industry Dummy 3 ^a	0.08	0.27	-.12**	-.21***																	
4. Industry Dummy 4 ^a	0.09	0.29	-.14**	-.23***	-.09'																
5. Industry Dummy 5 ^a	0.05	0.21	-.10'	-.16**	-.06	-.07															
6. Industry Dummy 6 ^a	0.07	0.25	-.12**	-.19**	-.08	-.08'	-.06														
7. Company Dummy 1 ^a	0.16	0.36	-.19***	.60***	-.12**	-.14***	-.10'	-.12**													
8. Company Dummy 2 ^a	0.03	0.18	-.08	-.14**	-.05	-.06	-.04	-.05	-.08												
9. Company Dummy 3 ^a	0.02	0.16	-.07	.22***	-.05	-.05	-.04	-.04	-.07	-.03											
10. Establishment size ^a	4.93	1.15	-.15***	.14***	.26***	.22***	-.16***	.09'	.01	-.21***	.19***										
11. Response percentage ^a	17.99	24.57	.35***	-.33***	-.19***	-.16***	.10'	-.13**	-.18***	.06	-.11**	-.70***									
12. Employee age	36.18	7.22	.03	.14**	-.02	-.01	-.02	-.02	.20***	-.12**	-.02	.07	.02								
13. Employee gender (1 = male; 2 = female)	1.18	0.36	-.18***	-.11**	-.05	-.04	.11**	.05	-.20***	.20***	.06	-.10'	.12**	-.15***							

continued.

TABLE 1 (continued)

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
14. Employee educational level	4.05	1.38	-.17***	-.10*	.01	.18***	-.07	.14***	-.11**	-.12**	.03	.19***	-.09*	-.21***	-.09*						
15. Employee organizational tenure	12.26	8.67	.11**	.22***	.05	-.03	-.11**	-.05	.31***	-.17**	.02	.17***	-.06	.71***	-.16***	-.38***					
16. HPWS ^a	4.88	0.65	-.19***	.36***	-.08	.19***	-.20***	-.25***	.24***	-.12**	.20***	.39***	-.32***	.02	-.10*	.08*	.16***				
17. Concern for employees climate ^a	3.97	0.98	-.19***	.09*	.05	-.04	.05	-.04	.12**	-.08	.04	.04	-.06	.03	.01	-.01	.03	.19***			(.80)
18. Job satisfaction	4.65	1.32	-.20***	.02	.07	.06	-.02	.03	.08	-.07	.05	.13**	-.15***	.06	.02	.08	.07	.15***	.41***		(.93)
19. Affective commitment	4.13	1.28	-.05	.08*	.11	-.01	.01	-.09*	.11**	-.09*	.06	.13**	-.10	.13**	-.14**	-.10*	.17***	.48***	.60***		(.85)

Note. N = 522 individuals from 76 establishments; internal consistency reliability coefficients (alphas) appear on the diagonal.

*p < .05; **p < .01; ***p < .001 (two-tailed);

^a Establishment-level means assigned down to individuals.

TABLE 2
Establishment-Level Analyses of Concern for Employees Climate

Variables	Model 1		Model 2	
Industry Dummy 1	.09	(.18)	.02	(.17)
Industry Dummy 2	.70*	(.20)	.39*	(.19)
Industry Dummy 3	1.75*	(.28)	1.91*	(.26)
Industry Dummy 4	.07	(.26)	-.44	(.25)
Industry Dummy 5	1.10*	(.33)	.50	(.32)
Industry Dummy 6	-.03	(.27)	-.35	(.25)
Company Dummy 1	-1.08*	(.19)	-1.18*	(.18)
Company Dummy 2	-.85*	(.30)	-1.47*	(.29)
Company Dummy 3	1.03*	(.33)	.84*	(.32)
Establishment size	.30*	(.03)	.11*	(.04)
% response	.02*	(.00)	.00	(.00)
HPWS			.34*	(.04)
R ²	.24		.31	

Note. $N = 76$ establishments; * $p < .05$; Unstandardized parameter estimates are reported; standard errors are inside ().

the four criteria for mediation indicated above (relationship between the independent and mediating variables).

Hypotheses 2 and 3 posited that concern for employees' climate mediates the relationships of HPWS and individual job satisfaction (Hypothesis 2) and affective commitment (Hypothesis 3). Table 3 reports the results of RCM analyses for Hypotheses 2 and 3. In analyses of each dependent variable, we entered control measures at a first model and then added HPWS at the second model and climate at the third and final model. Table 3 also reports Sobel's test of the indirect effect of HPWS on each dependent variable through climate.

In analyses of the two dependent variables, Model 2 (Table 3) showed that HPWS was positively related to both individual job satisfaction (.23, $p < .05$) and individual affective commitment (.25, $p < .05$). These results established that HPWS significantly related to each of the job attitudes, as predicted. In addition, results from Model 3 across analyses of the dependent variables showed that concern for employees climate positively related to both job satisfaction (.50, $p < .05$) and affective commitment (.75, $p < .05$), above and beyond HPWS. Furthermore, when introducing concern for employees' climate in Model 3, HPWS no longer significantly predicted job satisfaction (.10, *ns*) or affective commitment (.08, *ns*). In support of Hypotheses 2 and 3, these results fully meet the criteria for mediation set forth by Kenny et al. (1998) in that HPWS related to job attitudes and to concern for employees climate, and the relationships

TABLE 3
Cross-Level Mediation Analyses of Employee Reactions

Variables	DV = Job Satisfaction			DV = Affective Commitment		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<i>Level 2 predictors</i>						
Industry Dummy 1	-.85* (.27)	-.78* (.27)	-.53* (.25)	-.32 (.25)	-.27 (.27)	.11 (.21)
Industry Dummy 2	-.69* (.30)	-.70* (.31)	-.59* (.28)	-.25 (.28)	-.26 (.30)	-.08 (.20)
Industry Dummy 3	-.19 (.37)	-.06 (.39)	-.08 (.31)	.16 (.27)	.31 (.24)	.28 (.23)
Industry Dummy 4	-.37 (.35)	-.39 (.35)	-.16 (.37)	-.22 (.32)	-.24 (.36)	.06 (.29)
Industry Dummy 5	-.30 (.43)	-.21 (.31)	-.37 (.30)	.22 (.32)	.28 (.33)	.04 (.26)
Industry Dummy 6	-.43 (.23)	-.26 (.23)	-.16 (.24)	-.50 (.22)	-.31 (.24)	-.19 (.20)
Company Dummy 1	.41 (.38)	.37 (.38)	.24 (.41)	.31 (.39)	.24 (.41)	.01 (.33)
Company Dummy 2	-.69 (.41)	-.65 (.41)	-.41 (.39)	-.39 (.39)	-.34 (.40)	.00 (.36)
Company Dummy 3	.58 (.09)	.50 (.09)	.39 (.03)	.54 (.14)	.44 (.09)	.27 (.10)
Establishment size	.01 (.00)	-.04 (.00)	-.03 (.01)	.14 (.00)	.09 (.00)	.10 (.00)
% response	-.01 (.00)	-.01 (.00)	-.01* (.12)	.00 (.12)	.00 (.12)	.00 (.11)
HPWS		.23* (.12)	.10 (.13)		.25* (.12)	-.08 (.12)
Concern for employees climate			.50* (.13)			.75* (.12)
<i>Level 1 predictors</i>						
Age	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)
Gender	.11 (.17)	.12 (.17)	.12 (.17)	-.47* (.17)	-.46* (.17)	-.45* (.16)
Educational level	.03 (.05)	.03 (.05)	.02 (.05)	-.12* (.05)	-.12* (.05)	-.14* (.05)
Organizational tenure	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)	.00 (.01)	.00 (.01)
R ² _{L1}	.00	.00	.01	.04	.03	.07
R ² _{L2}	.56	.60	.84	.17	.48	1.00
R ² _{total}	.08	.09	.12	.08	.10	.16
Indirect effect		.17*			.26*	

Note. * $p < .05$; $N = 522$ employees in 76 establishments; Unstandardized estimates are reported; standard errors are inside (); DV = dependent variable; R²_{L1} = within-establishment variance accounted for by Level-1 predictors; R²_{L2} = between-establishment variance accounted for by Level-2 predictors; R²_{total} = total variance accounted for by both Level-1 and Level-2 predictors; Indirect effect = an estimate, based on Sobel (1982), of the indirect effect of HPWS on the individual-level DV through organizational climate.

between HPWS and job attitudes were no longer significant when introducing concern for employees climate.

Finally, tests of indirect effects provided additional support for Hypotheses 2 and 3 (see bottom row in Table 3). Results indicated that the indirect effect of HPWS on each of the dependent variables was significant—indirect effect = .17 ($p < .05$) for job satisfaction and .26 ($p < .05$) for affective commitment. These results suggest that the influence of HPWS on each outcome dropped significantly once introducing concern for employees' climate. In sum, the results fully supported Hypotheses 2 and 3, as concern for employees' climate was found to mediate the cross-level relationships of HPWS with job satisfaction and affective commitment. It is also worth noting that HPWS accounted for 1% to 2% of the total variance in each dependent variable (4% and 31% of the between-establishment variances in job satisfaction and affective commitment, respectively) over and above control variables; and, climate explained an additional 3% to 6% of the total variance in dependent variables (24% and 52% of the between-establishment variances in job satisfaction and affective commitment, respectively) above and beyond HPWS and control measures.

Auxiliary Analyses

To alleviate concerns that may be raised with this study, including the use of small number of employee responses within establishments, potential common method biases, and the potential for other mediators, we ran additional analyses—one for each dependent variable. First, we selected those establishments from which we received at least four or more employee responses ($N = 44$ establishments). Second, using establishments where data from four or more employees were obtained, we split the employee sample such that data from one half was used for measuring concern for employees climate and data from the other half for measuring the individual-level outcomes, effectively eliminating any overlap in the data used to measure HPWS (obtained from managers), climate (obtained from half the employee sample), and individual outcomes (obtained from the other half of the employee sample). Third, we included two additional variables (human capital and quality of social exchange at the establishment levels) as potential mediators to examine if, in fact, concern for employees climate acts as important mediator on the relationship HPWS and individual-level outcomes relative to other possible mediators that were found to mediate between HPWS and establishment performance in Takeuchi et al. (2007; for more information regarding these mediators and their measurement, please refer to Takeuchi et al., 2007).

Results from all auxiliary analyses are reported in the Appendix (note that analyses were comparable to Model 3 in Table 3, in that they included control measures, HPWS, and concern for employees climate as predictors). As shown in the Appendix, across all analyses, concern for employees' climate remained a significant predictor of the dependent variables, whereas HPWS again did not significantly predict the dependent variables in the presence of concern for employees' climate. Furthermore, human capital did not significantly predict any of the outcomes, and social exchanges significantly predicted affective commitment (.40, $p < .05$) but not job satisfaction. These results strongly corroborated the results reported in Table 3. Thus, it does not appear that establishments where we sampled fewer than four employees, or that common method biases, adversely affected our findings. Moreover, concern for employees' climate appeared to explain the relationships between HPWS and individual-level outcomes better than alternative establishment-level mediators (human capital and social exchanges).

Discussion

Although previous studies implied that HR systems influence employee attitude and motivation (e.g., Arthur, 1994; Delery & Shaw, 2001; Evans & Davis, 2005), empirical examinations of this cross-level effect has been lacking. One of the main objectives of this study was to explicate the underlying mechanisms through which HPWS relate to employees' job attitude. By drawing on theory and research from the strategic HRM and organizational climate literatures, the results supported the cross-level linkages from HPWS (establishment level) to climate (establishment level) to employee job attitudes (individual level). Next, we discuss the implications of these findings, limitations of the present research, and avenues for future research directed extending this work.

Implications to Theory and Practice

One of the most significant findings of this study, which contributes to the strategic HRM and organizational climate literatures, is the demonstration that shared establishment-level climate acts as an important mediator of the cross-level relationships between HPWS and individual job attitudes. In addition to supporting an important tenet of prior conceptualization of HPWS (i.e., the notion that such systems promote positive employee attitudes; Huselid, 1995), our findings extend prior work on organizational climate. In line with social information processing theory (Salancik & Pfeffer, 1978) and extending prior work on organizational climate (e.g., Borucki & Burke, 1999; Burke et al., 1992; James & James,

1989), we found support for the theoretical argument that concern for employees climate serves as conduit through which employees interpret HR practices and, in turn, translates HR practices into employee attitude formation. Finding the direct relationship between HPWS and concern for employees climate also provides an important empirical support for the assumption that climates are formed largely based on organizational practices and procedures, and redresses the paucity of research that examines antecedents of climate (Ostroff et al., 2003).

Our results also imply that there are multiple multilevel pathways through which HPWS benefit the organization. Specifically, our auxiliary analyses show that establishment-level human capital and social exchange quality—which Takeuchi et al. (2007) found to mediate between HPWS and establishment performance—were less potent mediators than concern for employees climate when considering the cross-level influences of HPWS on individual job satisfaction and affective commitment. In essence, this illustrates the possibility of multiple mediators and more intricate processes and interrelationships through which HPWS influences outcomes that span multiple levels of analysis (e.g., individual, group, establishment, and firm levels). We also note that the “bottom-up” influences of employee attitudes on firm performance are quite complex and likely involve multiple mediators at multiple levels of analysis (Ployhart, 2004; Ostroff & Bowen, 2000). Therefore, this study exemplifies how integration between micro and macro HRM can further our understanding of how strategic HRM constructs operate and influence outcomes across organizational levels and levels of analysis (see Wright & Boswell, 2002).

From a practical perspective, the results from this study may also be helpful to managers who may need to justify the adoption of HPWS. For example, managers can show that the adoption of HPWS has tangible benefits with regard to individual employee outcomes, such as increased job satisfaction and more affective commitment. All of these outcomes can lead to lower turnover rate for the organization and can help to reduce costs associated with employee turnover (cf., Cascio, 2003). Our findings in Table 3 suggest that, after taking into account the set of control measures, HPWS accounted for between 4% (in the case of job satisfaction) and 31% (in the case of affective commitment) additional between-establishment variance in the individual-level reactions, as well as 1% to 2% additional variance of the total variance in the outcomes. Although these may seem as small effect sizes, it is important to note that the impact of HPWS on individual-level attitudes was much greater when taking into account concern for employees' climate, which fully transmitted the effect of HPWS on each individual-level outcome. Thus, the total impact of HPWS on individual-level outcome—both direct and indirect—is noteworthy. The key practical implication here is that improving establishments' HRM

system does in fact translates into improved climate in which employees perceive their organization or establishment as caring about and supporting them, as well as more positive employee reactions. In this regard, these findings demonstrate the utility of implementing HPWS as means of improving a set of functional climate and employee attitudes.

Limitations and Future Research

There are certain limitations that need to be taken into account when interpreting the findings. First, given the use of cross-sectional data, causality cannot be inferred, although the “causal” arrows depicted in Figure 1 are based on theoretical predictions based on theoretical logic and prior findings from strategic HRM and organizational climate literatures (e.g., Arthur, 1994; Bowen & Ostroff, 2004; Huselid, 1995; McAllister & Bigley, 2002; Ostroff & Bowen, 2000). Second, due to practical reasons, we used a shortened item set for individual outcome measures. This may raise concerns regarding the validity of the scales and associated findings. However, we have found that using shortened measures of perceived organizational support and affective commitment did not prevent the detection of meaningful substantive relationships in prior research (e.g., Eisenberger et al., 2001; Griffin, Neal, & Parker, 2007). Thus, it did not appear that shortening of the measures adversely affected the validity of inferences drawn from this particular study. We encourage future studies to replicate and extend these findings using longitudinal and experimental or quasi-experimental designs, as well as more comprehensive measures of the variables examined here.

Second, we conceptualized and tested HPWS as a system (e.g., Guthrie, 2001), rather than its subcomponents (e.g., Batt, 2002; Huselid, 1995), to illustrate the impact of an overall HRM system on concern for employees climate and individual employee outcomes. Given that concern for employees' climate is conceptualized as a fairly general social construct, treating HPWS also as an overall system made for better conceptual alignment between the technical and social systems these constructs represent. However, it is possible that some subcomponents of HPWS have differential impacts on the mediators. Future studies that extend these findings and examine the effects of HPWS subcomponents on concern for employees' climate and other relevant variables of interest would be particularly valuable. We also acknowledge that some establishments may use other HR systems to manage their workforce such as productivity, commitment, or control oriented systems. Although our focus was solely on the impact of HPWS on white-collar, full-time permanent employees, a useful avenue for future research would be to examine the impact of these other, more specific HR systems on organizational climate and

employee outcomes. Future research is needed to replicate and extend this study by conceptualizing and including additional antecedents to tease out the exact relationships that may exist among various HRM practices and organizational climate.

Finally, the generalizability of our findings might be limited. However, given that the theoretical underpinning of this study is derived from Western theories, the Japanese sample may also be considered the strength of this study because we found theoretically derived relationships in a non-Western sample. Although we expect our findings to be generalizable to many different research settings, we would encourage future studies to collect data from different settings and replicate and extend our findings. A related issue is concerned about how representative the respondent establishments are to the general population and nonrespondent establishments. Although we were able to collect multiple responses from managers and employees from the participating establishments, we could not test for nonrespondent bias. Thus, it is possible that the respondent establishment somehow differed systematically from the nonrespondent firms. However, given that the percentage of responses were negatively correlated with HPWS and job satisfaction, it is less likely that the participating establishments were necessarily those who had successfully adopted HPWS and had higher employee outcomes.

This study highlights two additional areas for future research. First, given that different types of organizational climate such as climate for service (e.g., Liao & Chuang, 2004; Schneider et al., 1998), safety (e.g., Zohar, 2000), and empowerment (e.g., Seibert et al., 2004) can coexist within an entity, future research can investigate if and how HPWS affect other types of climate (in addition to global climate) and whether or not different types of climates affect variables that reside at different levels in a similar manner. We also encourage researchers to consider other theoretical perspectives and mechanisms linking HPWS to outcomes, such as team conflict, team empowerment, and individual empowerment and role clarity. Second, we can learn more about the individual- and establishment-level factors that act as moderators of the relationship between HPWS and organizational climate, and organizational climate and individual outcomes. For example, concern for employees climate may become less related to individual-level outcomes if HPWS are implemented more variably to employees and different employment groups within the organization (e.g., Lepak & Snell, 2002). In addition, we encourage additional research that examines the influence of personal characteristics in the future.

In sum, this study contributes to the strategic HRM literature by illustrating the cross-level linkages among HPWS, concern for employees' climate, and employee outcomes (job satisfaction and affective

commitment). These results also provide insights into the differences between a technical system (i.e., HPWS) and a social system (organizational climate) and how the influence of a technical system translates into the social system, which ultimately influences the employees operating within the technical and social systems. We hope this research will stimulate much needed additional work on the social and multilevel mechanisms through which HPWS and other strategic HRM concepts impact important outcomes in and of organizations.

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APPENDIX
Auxiliary Analysis Results

Variables	DV = Job Satisfaction			DV = Affective Commitment		
	4 or more employees per establish. <i>N</i> _{ind.} = 445 <i>N</i> _{est.} = 44	Split sample <i>N</i> _{ind.} = 223 <i>N</i> _{est.} = 44	Full sample with other mediators <i>N</i> _{ind.} = 522 <i>N</i> _{est.} = 76	4 or more employees per establish. <i>N</i> _{ind.} = 445 <i>N</i> _{est.} = 44	Split sample <i>N</i> _{ind.} = 223 <i>N</i> _{est.} = 44	Full sample with other mediators <i>N</i> _{ind.} = 522 <i>N</i> _{est.} = 76
<i>Level 2 predictors</i>						
Industry Dummy 1	-.54* (.23)	-.52 (.36)	-.54* (.24)	.09 (.22)	-.06 (.33)	.14 (.21)
Industry Dummy 2	-.46* (.23)	-.23 (.34)	-.63* (.22)	.09 (.22)	.35 (.32)	-.10 (.20)
Industry Dummy 3	-.16 (.29)	.33 (.44)	-.02 (.29)	.22 (.28)	.61 (.42)	.28 (.26)
Industry Dummy 4	-.08 (.28)	-.23 (.42)	-.02 (.29)	.17 (.26)	.15 (.39)	.17 (.26)
Industry Dummy 5	-.43 (.38)	-.35 (.59)	-.40 (.32)	.01 (.36)	-.14 (.55)	-.04 (.29)
Industry Dummy 6	-.06 (.33)	.25 (.49)	-.20 (.30)	-.14 (.31)	.34 (.45)	-.14 (.26)
Company Dummy 1	.10 (.23)	-.06 (.34)	.24 (.22)	-.18 (.22)	-.16 (.32)	-.03 (.19)
Company Dummy 2	-.18 (.39)	.62 (.60)	-.48 (.36)	.03 (.37)	1.43* (.58)	-.15 (.33)
Company Dummy 3	-.42 (.67)	.95 (.97)	.59 (.42)	.10 (.63)	1.06 (.95)	.18 (.39)
Establishment size	.07 (.11)	.13 (.16)	-.02 (.08)	.12 (.10)	.07 (.15)	.08 (.08)
% response	-.01 (.00)	.00 (.01)	-.01 (.00)	.00 (.00)	.01 (.01)	.00 (.00)
HPWS	.10 (.16)	-.05 (.22)	.19 (.14)	.08 (.14)	.00 (.21)	.11 (.12)
Concern for employees climate	.45* (.16)	.33* (.17)	.56* (.17)	.72* (.15)	.35* (.18)	.47* (.16)
Social exchanges			-.06 (.15)			.40* (.14)
Human capital			-.19 (.14)			-.08 (.13)
<i>Level-1 predictors</i>						
Age	.02 (.01)	.00 (.02)	.01 (.01)	.01 (.01)	-.01 (.02)	.01 (.01)
Gender	.11 (.18)	.10 (.26)	.12 (.17)	-.49* (.17)	-.66* (.27)	-.41* (.16)
Educational level	.03 (.05)	.04 (.08)	.02 (.05)	-.14* (.05)	-.09 (.08)	-.14* (.05)
Organizational tenure	.01 (.01)	.02 (.02)	.01 (.01)	.00 (.01)	.03 (.02)	.00 (.01)

Note. **p* < .05; Unstandardized parameter estimates are reported; standard errors are inside (); DV = Dependent Variable.