

**PERCEPTIONS OF THE PRESENCE AND EFFECTIVENESS OF HIGH
INVOLVEMENT WORK SYSTEMS AND THEIR RELATIONSHIP TO EMPLOYEE
ATTITUDES: A TEST OF COMPETING MODELS**

Morris B. Mendelson
Faculty of Business, University of New Brunswick Saint John,
Saint John, New Brunswick, Canada,

Nick Turner
Asper School of Business, University of Manitoba,
Winnipeg, Manitoba, Canada

Julian Barling
Queen's School of Business, Queen's University,
Kingston, Ontario, Canada

About the authors

Dr. Morris Mendelson is an Associate Professor and Assistant Dean in the Faculty of Business, University of New Brunswick Saint John. His research interests include high involvement work systems, healthy organizations, and transformational leadership. Morris Mendelson is the corresponding author and can be contacted at: mmendels@unbsj.ca

Dr. Nick Turner is an Associate Professor and Associate Dean in the Asper School of Business at the University of Manitoba. His research interests focus on occupational health psychology.

Dr. Julian Barling is a Professor and Associate Dean in the Queen's School of Business, Queen's University. His research interests include transformational leadership, workplace aggression, and workplace safety.

ABSTRACT

Purpose – Prior research has demonstrated the positive effects of high involvement work systems on various outcomes but none to date has conducted a comparative test of alternative, plausible models of these systems. A test of five high involvement work system models was conducted. The models were tested using employee perceptions of the presence and effectiveness of the organizational practices included in these systems, whereas a majority of prior studies have measured high involvement work practices based on managers' perceptions only.

Design/methodology/approach – Measures of eight high involvement work practices (i.e., employment security, selective hiring, extensive training, contingent compensation, teams and decentralized decision-making, information sharing, reduced status distinctions, transformational leadership) were used to compare the fit of these five models using confirmatory factor analysis. 317 non-management employees from 5 Canadian organizations participated. Participants rated both the extent to which they perceived their organizations to have implemented each of the practices and the perceived effectiveness of these practices. Participants' work attitudes (i.e., affective commitment, continuance commitment, job satisfaction) were used to assess the concurrent validity of the tested models.

Findings – For both the perceived presence and effectiveness models, confirmatory factor analyses suggested the superiority of a second-order model, demonstrating concurrent validity with participants' positive (i.e., affective commitment, job satisfaction) and negative (i.e., continuance commitment) attitudes.

Research limitations/implications – Limitations of the study include the threat of mono-method bias and the lack of a representative sample.

Practical implications – Organizations should attempt to implement high involvement work systems, as employees who perceive the presence and effectiveness of these organizational practices are more likely to be committed to the organization and satisfied with their jobs.

Originality/value – First study to conduct a comparative test of five alternative models of high involvement work systems. One of the few studies to address employee perceptions of these practices.

Keywords – High Involvement Work Systems, Affective Commitment, Job Satisfaction, Continuance Commitment

Paper type – Research paper

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High involvement work systems reflect meaningful, interrelated patterns of work practices that are intended to increase organizational performance (Van Buren and Werner, 1996). The organizational practices found in high involvement work systems are designed to treat people as organizational resources in which to invest, rather than costs to be controlled (see Arthur, 1992; Barling *et al.*, 2003; Pfeffer, 1998; Pfeffer and Veiga, 1999). A growing body of research (e.g., Arthur, 1994; Bailey *et al.*, 2001; Browning, 2006; Huselid, 1995; Huselid *et al.*, 1997; Hoque, 1999; Patterson *et al.*, 2004; Vandenberg *et al.*, 1999; Zacharatos *et al.*, 2005; Zacharatos *et al.*, 2007) provides strong support for the correlational relationship between high involvement work systems and various positive outcomes for employees, organizations, and their customers. Adoption of employee-friendly HR practices has been linked consistently with a host of beneficial organizational outcomes including higher productivity (e.g., Arthur, 1994; Huselid, 1995; Fulmer *et al.*, 2003), profitability (e.g., Huselid, 1995; Fulmer *et al.* 2003), customer satisfaction and retention (Hartline and Ferrell, 1996; Hoque, 1999; Schneider, White, & Paul, 1998), better workplace safety (Zacharatos *et al.*, 2005), and lower turnover (e.g., Arthur, 1994; Guthrie, 2001; Fulmer *et al.*, 2003), waste, and inefficiency (e.g., Arthur, 1994).

In the current study, we use Pfeffer's (1998) seven practices (i.e., employment security, selective hiring, extensive training, teams and decentralized decision making, reduced status distinctions, compensation partially contingent on performance, and information sharing)[1]. First, although other conceptualizations of the practices that constitute high involvement work

systems exist, we believe that the seven that Pfeffer (1998) outlines are representative of the field and are congruent with other definitions of practices (e.g., Delery and Doty, 1996; Zacharatos *et al.*, 2005). Second, while there is divergence on labelling of these practices among existing models, there are more commonalities in content than differences (Wood and Wall, 2005). Third, we agree with Way (2002) and Wood and Wall (2002) who suggested that one of the major weaknesses in the research in this area to date is that measures and practices have been chosen on empirical rather than conceptual grounds. They argue further that researchers ought to begin basing research on theory rather than on co-occurring practices. In the current research, we decided to start with a comprehensive yet parsimonious list of practices that are consistent with conceptual models of high involvement work systems. By testing alternative models, the current research, then, offers both theoretical and empirical contributions.

In addition to Pfeffer's (1998) seven practices, we also argue for the inclusion of a transformational leadership component (Bass, 1985) as an important practice in a high involvement work system. Leadership can identify training needs, create and sustain teams and team members' motivation, and ensure information sharing occurs to sustain trust and commitment (e.g., Barling *et al.*, 2003; Zacharatos *et al.*, 2005). Further, transformational leaders enable followers to transcend their own self-interests for a higher purpose or vision and to exceed performance expectations (Bass, 1985; Howell and Hall-Merenda, 1999). They do this by paying attention to the concerns and developmental needs of their followers (individualized consideration), instilling them with pride, trust, and respect (idealized influence), inspiring them with high expectations and confidence in their ability to achieve their goals (inspirational motivation), and by helping them look at old problems in new ways and with new solutions

(intellectual stimulation; see Bass, 1990; 1998). These behaviours are consistent with treating employees as an organization's most important asset. We argue that the employee-centred practices essential to creating a high involvement work organization are consistent with the transformational leadership concept. Furthermore, to ensure the proper implementation of any employee-centred human resource management strategy, those implementing the practices would need to engage in the behaviours described in the four components of transformational leadership. Transformational leadership has been found to be positively associated with organizational commitment (e.g., Barling *et al.*, 1996; Koh *et al.*, 1995; Piliai and Williams, 2004), organizational citizenship behaviours (e.g., Koh *et al.*, 1995; Piliai *et al.*, 1999; Mackenzie *et al.*, 2001), financial (see Barling *et al.*, 1996), and job performance (e.g., Avolio *et al.*, 1999; Howell and Hall-Merenda, 1999; Mackenzie *et al.*, 2001; Piliai and Williams, 2004), and a reduced intent to turnover (Bycio *et al.*, 1995).

In addition to uncertainty concerning the number and type of practices that make up high involvement work systems, there is some disagreement about the relationship among these practices. For example, Pfeffer (1995; 1997; 1998) and Pfeffer and Veiga (1999) argue that there are seven inter-related elements representing what Pfeffer (1998) labelled a "high performance work system." Other authors have suggested that these organizational practices reflect a single construct (e.g., Wood and Menezes, 1998; Wood, 1999a; Zacharatos *et al.*, 2005). Finally, other researchers (Bailey *et al.*, 2001; Huselid, 1995; Huselid *et al.*, 1997; Patterson *et al.*, 2004) have argued that high involvement work systems are 'bundles of practices' that work together to predict organizational outcomes[2]. The research to date has operationalized high involvement work systems in various ways and using various measures, yet it remains unclear how such a

system might be operationalized (see Wood, 1999b; Wall and Wood, 2005).

The central aim of this study is to explore the underlying nature of high involvement work systems. First, five theoretically plausible models of high involvement work systems are proposed and tested using data reflecting employees' perceptions of both the presence and effectiveness of various human resource management practices. Previous measures of high involvement work systems have often been developed to evaluate the presence (or absence) of human resource management practices as reported by senior managers or human resource practitioners. One weakness in this approach is that the mere presence of a practice does not speak to its perceived effectiveness (Vandenberg *et al.*, 1999; Wall and Wood, 2005). There is now considerable debate in the literature (e.g., Edgar and Geare, 2005; Guest, 2001) about the comparability of models based on data about the *existence* (often operationalized as 'presence' or 'absence') and the *effectiveness* (often operationalized as a judgement on how well the practice works) of these organizational practices. While various studies (e.g., Appelbaum and Berg, 2000; Kane *et al.*, 1999) have focused on the nature of the models based on different sources, the differential knowledge to be derived from an understanding of the presence or effectiveness of high involvement practices remains unclear.

Second, to show the concurrent validity of the models tested, we use several job attitudes (i.e., job satisfaction, affective commitment, and continuance commitment) anticipated to relate in differential ways to perceptions of high involvement work systems. This would be consistent with prior research, which has already demonstrated strong relationships of high involvement work practices with job satisfaction (e.g., Ashford *et al.*, 1989; Birdi *et al.*, 1997; Fried and Ferris, 1987; Macky and Boxall, 2008; Major *et al.*, 1995) and multiple forms of commitment

(e.g., Meyer *et al.*, 2002). These variables are discussed in further detail later. Notwithstanding the positive relationships between high involvement work practices and employee attitudes, there nevertheless still exists a dearth of research looking at the underlying processes by which these practices seem to lead to positive organizational outcomes (e.g., Boxall and Macky, 2007).

Competing Models of High Involvement Work Systems

A number of models of high involvement work systems have been proposed in the literature. To date, however, no studies have attempted to contrast statistically competing models. One of the aims of the current study is to provide information regarding the internal structure of high involvement work systems. Despite the confusion regarding the conceptualization of high involvement work systems, the present research offers the possibility of testing alternative models to assess whether high involvement practices load better as bundles of practices (multiple factors), as separate practices loading on a second-order construct, or as a number of practices loading onto a single factor. Contrasting several different conceptual models avoids the potential threat of only testing one 'preferred' model, and finding support for that model, when other models may do an equal or better job of explaining variation in focal outcomes (Cooper and Richardson, 1986).

In the current study, we explicitly contrast five models describing the underlying nature of employees' perceptions of high involvement work practices. To date, the focus in the literature more generally has been on the relationships between different work systems and various organizational outcomes. Table 1 provides a brief overview of the five models described in more detail below.

Insert Table 1 about here

Model 1: High Involvement Work System First-Order Factor Model

Some authors have suggested that the various high involvement work practices are really part of a first-order factor structure (see Wood, 1999b; Wood and Albanese, 1995; Zacharatos *et al.*, 2005); the various practices are viewed as comprising a single construct. For example, Zacharatos *et al.* (2005) bundled 10 high performance work system practices (i.e., employment security, selective hiring, extensive training, teams, contingent compensation, information sharing, reduced status distinctions, and transformational leadership) into one factor to predict occupational safety outcomes. The current research will allow for a comparative test of the fit of the one-factor solution in relation to the other models tested.

Model 2: High Involvement Work System Second-Order Factor Model

Vandenberg *et al.* (1999) suggested that one method of ascertaining the combined effects of HR practices while still assessing their individual impacts is to load each organizational practice onto a second-order construct. Vandenberg *et al.* argue that “higher order constructs have been used in other situations where the meaning of a conceptual entity cannot be captured through its individual components, but must be captured through the common forces underlying those components” (p. 306). In this research, following Vandenberg *et al.* (1999), we test a model comprising practices that are expected to load onto a second-order factor.

Model 3: Opportunity, Motivation, and Skill Participation Bundles Model

Another set of models as identified by various researchers (e.g., Bailey *et al.*, 2001;

Huselid *et al.*, 1997; Patterson *et al.*, 2004) is based on the notion of bundling human resource management practices. Given that several different bundles have been identified, we tested several ways in which high involvement work practices have been proposed to bundle into different factors. A fundamental premise underlying the notion of bundles of HR practices is that, irrespective of their nature, they are mutually reinforcing (Wood and Wall, 2002).

Bailey *et al.* (2001) argue that high involvement work systems are comprised of three groupings or bundles of practices. The first bundle ‘Opportunity’ would comprise the chance to participate in decision-making, which includes information sharing, reduced status distinctions, and teams. Organizations that promote the free exchange of information indicate that they do so as a basis to participate in individual and organizational decisions; being team-based presents employees with the opportunity to make decisions collectively; and reducing status distinctions creates an environment in which individuals can participate equally in the organizations without having to defer to higher authority.

The second bundle ‘Motivation to Participate’ comprises incentives that motivate employees to engage in decision-making activities. This would include contingent compensation, employment security, and transformational leadership. First, feeling secure in one’s tenure within an organization would suggest that employees might feel less reticent about sharing ideas and taking risks by making decisions and being afforded autonomy. Second, having supervisors who are perceived as transformational would enhance a climate of empowerment and motivation to participate.

The third bundle, labelled ‘Skills to Participate’, would include selective hiring and extensive training. Selective hiring is a central prerequisite for subsequent high quality

participation to the extent to which it focuses on interpersonal abilities, communication skills, and ability to work cooperatively with others (Pfeffer, 1998). Extensive training goes beyond specific task-related skills enabling employees to consider job-related issues outside of the formal description, such as strategic or bigger-picture production issues, and developing confidence in task execution (Axtell and Parker, 2003).

Model 4: Technical and Strategic HRM Bundles Model

Based on the work by Huselid *et al.* (1997), selective hiring, contingent compensation, and extensive training are linked together as a bundle of activities labelled ‘Technical Human Resource Management Practices’. The rationale behind bundling these traditional ‘bread and butter’ HR practices is that they have been institutionalized through the expectations of internal (e.g., supervisors and senior managers) and external (e.g., government regulations and laws, professional organizations) stakeholders (see Huselid *et al.*, 1997, p. 172).

The other high involvement work practices such as employment security, teams and decentralized decision-making, information sharing, reduced status distinctions, and transformational leadership would be bundled under the heading of ‘Strategic Human Resource Management Practices’. Arguably, offering organizational members employment security would reflect a strategic decision to ensure that employees have high levels of affective commitment and reduced stress stemming from job certainty. Research to date tends to support the idea that employment security is linked to positive organizational outcomes including reduced intention to turnover (i.e., Ashford *et al.*, 1989) and higher productivity levels (Delery and Doty, 1996). Information sharing and reduced status distinctions are suggestive of what Huselid *et al.* (1997) labelled employee-management communications and empowerment and participation

respectively, and which they identified as being strategic practices. Finally, although transformational leadership was not a factor identified by Huselid *et al.* (1997), we would argue that leadership does not so much require technical as much as strategic management activities. Leadership is essential if high involvement practices are not only implemented, but done so effectively. Implementation of high involvement work practices requires strong leadership to overcome resistance and deeply institutionalized practices (Wood and de Menezes, 1998).

Model 5: Skill Enhancement, Job Design, and Compensation Bundles Model

Although Patterson *et al.* (2004) did not explicitly discuss bundles, they did suggest that activities such as training and selective hiring are indicative of ‘Skill Enhancement’ activities. The other bundle suggested by Patterson *et al.* (2004) was one we label ‘Job Design’ which includes skill flexibility, job variety, responsibility, and teams. We would argue that skill flexibility, job variety, and responsibility would relate to reduced status distinctions as there would be less of a focus on clearly defined roles as employees share and exchange tasks. Patterson *et al.* (2004, p. 645) would support this assertion, as they argue that “with the expertise and the authority to solve problems, employees can implement solutions more quickly than if problems have to be referred up the hierarchy.” Furthermore, information sharing and teams would be required to ensure that each employee is better able to cope with the increased job variety and responsibility. A central premise of transformational leadership is to inspire one’s followers to achieve a common vision or goal (Bass, 1985). One way of achieving this is by allowing employees more decision latitude and greater responsibility. Therefore, we would suggest that transformational leadership fits within the job design bundle. Although Patterson *et al.* (2004) do not focus on employment security, we argue that this is an implicit part of the ‘Job

Design' bundle as employees are provided more confidence in maintaining their employment by the nature of how jobs are designed for increased flexibility and ensuring protection of core jobs in the organization (Pfeffer, 1998). Finally, Patterson *et al.* (2004) did not bundle compensation with the other organizational practices just described. Therefore, we have included the practice of contingent compensation as a single practice within this model and have labelled it 'Compensation'.

Validating the Models

In the previous section, we described the conceptualization of five competing models of high involvement work systems as a precursor to operationalizing these models in the current study. A necessary second step in this process is assessing the level of validity of the proposed models. To do this, we have chosen to use measures of affective commitment, job satisfaction, and continuance commitment as checks of concurrent validity. We expect similar, positive relationships between high involvement work systems and both affective commitment to the organization and job satisfaction. We have also included a measure of continuance commitment and predict that it should be non-significant or negatively related to high involvement work systems.

Job Satisfaction

Job satisfaction refers to both an individual's cognitive evaluation of various job characteristics and her emotional experiences at work (Weiss and Cropanzano, 1996). Schappe (1998) agrees suggesting that job satisfaction has a cognitive (i.e., "...rational evaluation of work conditions, opportunities, and outcomes") and an emotional component (i.e., "...an overall positive emotional appraisal of the job", p. 279). Job satisfaction has been shown to be related to

job security (e.g., Ashford *et al.*, 1989), training (Birdi *et al.*, 1997), feedback inherent in information sharing (e.g., Fried and Ferris, 1987), and team support (e.g., Major *et al.*, 1995), all aspects of a high involvement work system. Recently, Macky and Boxall (2008) found that employees with a greater experience with high involvement work systems have higher levels of job satisfaction, lowered job-related stress and fatigue, and more work-life balance. Therefore, we expect that employees' perceptions of high involvement work systems in their organizations will be positively associated with job satisfaction as a test of concurrent validity.

Affective Commitment

Affective commitment refers to "...an affective or emotional attachment to the organization such that the strongly committed individual identifies with, is involved in, and enjoys membership in the organization" (Allen and Meyer, 1990, p. 2). This emotional attachment has been suggested by Ogilvie (1986) to be predicted by how positive employees' perceptions are of the organization's human resources practices. The more positive employees' perceptions, the greater their commitment is to the organization. We believe that organizations that have HR practices that treat employees as people rather than commodities to be bought and sold (i.e., high involvement work system) will have employees with higher levels of affective commitment. Meyer and Herscovitch (2001, p. 323) similarly argued that "[A]llowing members to participate in the development and implementation of policy is likely to create affective commitment." This participation by employees is consistent with many of the practices highlighted in the theories of high involvement work practices. Although Meyer and Herscovitch did not identify specific practices that would lead to the development of affective commitment, they did suggest that if employees are bound to a course of action out of fear or obligation, they

are more likely to experience continuance or normative commitment respectively.

Meyer *et al.* (2002) found that work experiences were most strongly related to affective commitment and less so to continuance and normative commitment. More specifically, Meyer *et al.* (2002) reported in their meta-analysis that high levels of organizational support, transformational leadership, and organizational justice were positively predictive of affective commitment. Although not specifically addressing the topic of high involvement work systems, Meyer's *et al.* (2002) findings support the expected positive impacts of these practices on affective commitment. They do state, however, that "...variables (e.g., human resource management policies and practices) that contribute to perceptions of support might indirectly contribute to the development of affective commitment" (p. 38).

McElroy (2001) argued that each of Pfeffer's seven components of high performance work practices should lead to higher affective commitment. To illustrate, offering employment security signals a commitment by to the employer to the employee. As such, the norm of reciprocity suggests that this commitment will be returned in kind (Tsui, Pearce, Porter, and Tripoli, 1997). Ashford *et al.* (1989) also found a positive relationship between employment security and affective commitment. McElroy (2001) suggests that employment security will lead employees to have a stronger belief in the organization's core values. Selective hiring should result in only the employees best suited to the organization being hired and it also sends a message that members are part of a select group of recruits. Having self-managed teams has been argued to increase employees' levels of affective commitment due to the increased level of autonomy and responsibility for the decisions that affect their work (Pfeffer and Veiga, 1999). High compensation contingent on organizational performance could also lead to higher levels of

affective commitment for a number of reasons. First, high pay communicates to employees the value they possess to the organization. Second, by linking compensation to performance, there is a greater likelihood of perceived equity, which has been shown to be positively associated with affective commitment (Allen and Meyer, 1990; DeWitt, Trevino, and Mollica, 1998). Finally, training should be associated with higher levels of affective commitment because of the perception that it will increase employees' sense of self-worth and efficacy, thereby increasing identification with organizational goals (McElroy, 2001).

Continuance Commitment

In contrast, continuance commitment refers to one's perceived psychological and economic investments in the organization for which she works and this type of commitment also represents a desire to stay based on the perceived costs of exit (Meyer, Paunonen, Gellaly, Goffin, and Jackson, 1989; Somers and Birnbaum, 2000) as opposed to the intrinsic value ascribed to one's work or organization. More specifically, employees with high scores on a scale of continuance commitment believe that it would be difficult to leave their present organizations. This belief may stem from the perception that other organizations may not equal the economic benefits they currently enjoy and because change, being a psychological cost, is often more tenuous when one has been with an organization for an extended duration of time (Somers and Birnbaum, 2000).

One could argue that high involvement work practices should either be negatively associated with or show non-significant relationships with continuance commitment. For example, employees given autonomy, skill development, and working in an environment with reduced status distinctions would be expected to elicit loyalty and a strong identification towards

their organization. Conversely, these benefits would not be expected to lead to feelings of being trapped without viable alternatives. Therefore, we expect employees' perceptions of the presence of high involvement work practices and the perceived effectiveness of these practices will have either non-significant or small negative relationships with continuance commitment.

Methods

Sample and Procedure

Using the membership directory of the Human Resources Association of New Brunswick, approximately 100 organizations of all sizes throughout the Canadian province of New Brunswick were contacted. We telephoned only those people who were listed as senior HR managers (i.e., Vice-President HR, Director of HR, Senior HR manager) from organizations and discounted any members who were in a lower level management or academic position. Those people contacted were told that we were conducting a study on employees' perceptions of their organization's management practices, and were asked if they would allow us to invite their non-management employees to participate in this study. Managers who agreed forwarded an electronic mail invitation to all their non-management employees, which assured potential participants of the voluntary and confidential nature of the survey, and referred them to an external website containing the electronic questionnaire[3]. Only the principal author in this study had access to the raw data.

Three hundred and seventeen employees working in five public and private organizations throughout New Brunswick participated in this study. An exact response rate was not calculated as we could not know how many electronic mail invitations were distributed by managers to their employees. However, 285 respondents (89.9%) in the sample did indicate their place of

employment: Employee participants working in various provincial government departments (n = 40 out of \simeq 630, 6.3%), city government (n = 50 out of \simeq 420, 12%), a mid-sized university (n = 81 out of \simeq 2100 employees, 3.9%), and two crown corporations[4] (n = 78 out of \simeq 2400 employees, 3%; n = 36 out of \simeq 400 employees, 9%, respectively) completed the questionnaire.

Of the 317 questionnaires that were completed, 313 provided data that could be used in the current study. Data from four respondents' (3 female, 1 male) data were removed from the final sample because they failed to respond to a majority of the items requested. Of the 313 remaining (M age = 40.1 years; SD = 10.42; range = 18 to 61; organizational tenure M = 5.89 years, SD = 3.24; range = 1 to > 30), 61.1% of the respondents were female employees. Full-time employees constituted 92.9% of the sample. Less than six percent (5.9%) of participants reported working in organizations with fewer than 100 employees; 24.9% reported working in organizations with more than 1,000 employees.

Measures

High Involvement Work System Measures. We developed and tested a 36-item measure of high involvement work practices (four items for each of the first seven practices and eight items for transformational leadership). Following recommendations by Churchill (1979), we removed items that most negatively affected each of the measure's internal consistency, resulting in a 28-item measure of high involvement work practices (see Appendix A[5]).

Insert Appendix A about here

First, for each item, respondents were asked to rate how certain or uncertain they were

that their employer has the practice described on a seven point Likert-type scale (1 = absolutely sure it does not; 4 = neither sure nor unsure; 7 = absolutely sure it does). Second, for each item that respondents scored as a 5 (somewhat sure it does), 6 (pretty sure it does) or 7 (absolutely sure it does), they were also asked to rate the perceived effectiveness of that practice described on a seven-point Likert type scale (1 = extremely ineffective; 7 = extremely effective). In rating perceived effectiveness, items were accorded a score of 1 if the respondent had reported that the practice was not present in the organization. In essence, we treated the perceived absence of a practice as a proxy for the relative ineffectiveness of that practice. Stated differently, it is argued that because the practices as described in the questionnaire items would be deemed positive for employee well-being and development (e.g., employment security, extensive training, teams and decentralized decision making), their perceived absence could be used as a measure of their ineffectiveness. For example, if an employee does not perceive the presence of open information sharing, the organization would be seen as having ineffective internal communications.

Job Satisfaction. Warr *et al.* (1979) 15-item Job Satisfaction scale was used which asks participants to respond to the following statement “At your place of work, how satisfied are you with...” (e.g., “your fellow workers?”). Items were measured on a seven point Likert type scale ranging from 1 (extremely dissatisfied) to 7 (extremely satisfied).

Affective and Continuance Commitment. Eight items from Allen and Meyer (1990) measuring respondents’ emotional attachment (affective) to their organization (e.g., “I enjoy discussing my organization with people outside of it”) and nine items measuring commitment based on no viable alternatives (continuance) to the current organization (e.g., “One of the few negative consequences of leaving this organization would be the scarcity of available

alternatives”) were rated on a seven point Likert type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Results

Perceived Presence of High Involvement Work Practices

Descriptive statistics and inter-correlations for the study variables appear in Tables 2 and 3.

Insert Tables 2 and 3 about here

All five models were analyzed based on the covariance matrix and calculated using maximum likelihood estimation as implemented in LISREL 8.54 (Jöreskog and Sörbom, 2003). Using Anderson and Gerbing’s (1988) two-stage modelling approach, the fit of the measurement model was established before the structural relations were assessed. For the High Involvement Work System First Order Factor Model (Model 1), the measurement model was represented by all items loading onto one factor. For each of the High Involvement Work System Second Order Factor Model (Model 2) and three Bundles Models (Models 3, 4, and 5), the same measurement model was used.

Following Bagozzi and Edwards’ (1998) recommendations for item parcelling, each of the latent variables that were measured with four items (i.e., employment security, extensive training, and teams and decentralized decision making) were made into two subscales by averaging every even item, creating one subscale, and doing the same with the remaining items. The two subscales were then used to reflect their corresponding latent factor. For those latent

variables that were measured with two items (i.e., selective hiring, contingent compensation, reduced status distinctions, and information sharing), each item was treated as one subscale reflecting its corresponding latent factor. In the case of transformational leadership, which had eight items (two for each of the four factors of idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration), two subscales were also created. This was achieved by averaging every second item (four items), creating one subscale, and doing the same for the other subscale (four items). The rationale for collapsing these items into two scales instead of four represented an attempt to ensure a fair comparison (see Cooper and Richardson, 1986) between it and the other measures of high involvement work practices.

In the first phase of the analyses, the five measurement models in which all 22 parcelled subscales (i.e., 16 subscales measuring the eight high involvement work practices with the addition of the two subscales for each of job satisfaction, affective commitment, and continuance commitment) were entered into each of the models. In the second phase, the measurement model was used to test each of the five structural models by assessing each model's concurrent validity by loading the latent variable(s) on to job satisfaction, affective commitment, and continuance commitment.

As recommended by a number of authors (i.e., Bollen, 1989; Marsh *et al.* 1996; Tomarken and Waller, 2003; Tanaka, 1993), we used a number of fit indices: the chi-square test (χ^2 ; Bollen, 1989) as it is often used to conduct comparative nested model fits (e.g., null, fully mediated, non-mediated); the Adjusted Goodness of Fit Index (AGFI; Hu and Bentler, 1995); the Root Mean Square Error of Approximation (RMSEA); the Non-Normed Fit Index (NNFI; Tucker and Lewis, 1973); the Incremental Fit Index (IFI; Bollen, 1989); the Parsimonious

Goodness of Fit Index (PGFI; James *et al.*, 1982), which adjusts the goodness of fit index (GFI) for the degrees of freedom in the model (Kelloway, 1998); and the Expected Cross-Validation Index (ECVI; Browne and Cudeck, 1989). Although not often reported, the ECVI is recommended when models that are being compared are not nested (Byrne, 1998). The lower the value of the ECVI, the better the model fit. However, unlike many of the other fit indices (i.e., NNFI, IFI, AGFI), there are no suggested cut-off values. The method used to evaluate fit of a model is to inspect the ECVI of a given model and evaluate it relative to the other ECVIs reported in the alternative models assessed.

Measurement Models

The High Involvement Work System First-Order Factor indicating that all items representing organizational practices load onto one factor, with the six subscales measuring job satisfaction, affective commitment, and continuance commitment loading onto a second separate factor provided a poor absolute fit to the data: $\chi^2(206, N = 313) = 1077.66, p < .001$; AGFI = .70; RMSEA = .12, $p < .001$; NNFI = .85; IFI = .86; PGFI = .62; ECVI = 3.79.

As it is only the analysis of the structural fits that differentiate the remaining four models (i.e., High Involvement Work System Second-Order Factor Model; Opportunity, Motivation, and Skills Participation Bundles Model; Technical and Strategic HRM Model; and the Skill, Job Design, and Compensation Bundles Model), all were measured with the same measurement model. More specifically, each of these models had the organizational practices subscales loading on to the same eight separate latent variables. Further, each of the four models includes the same concurrent validity measures (i.e., job satisfaction, affective commitment, and continuance commitment). With the exception of the significant chi-square and the AGFI, the

measurement model provided a good fit to the data: $\chi^2(154, N = 313) = 274.79, p < .001$; AGFI = .88; RMSEA = .05; NNFI = .96; IFI = .98; PGFI = .56; ECVI = 1.53.

Although the fit of the measurement model was reasonable, the individual items measuring the perceived presence of reduced status distinctions did not significantly load onto the corresponding latent variable[6]. Based on the poor reliability ($\alpha = .15$) of this measure, the non-significant loading is not surprising. One could argue that, because it does not add any variance to the model, it should be removed. However, there are both conceptual and empirical reasons for its inclusion; a number of researchers have either argued for (e.g., Pfeffer, 1998) or have included (e.g., Zacharatos *et al.*, 2005) reduced status distinctions as a factor of high involvement work systems. As a result, by way of comparison across studies, we retained reduced status distinctions in the present analysis.

Concurrent Validity

In this stage, all four of the retained models (i.e., High Involvement Work System Second Order Factor Model; Opportunity, Motivation, and Skills Participation Bundles Model, Technical and Strategic HRM Bundles Model; Skill Enhancement, Job Design, and Compensation Bundles Model) were tested for concurrent validity by including job satisfaction, affective commitment, and continuance commitment (see Table 4 for the fit of each model). We first tested the fit of the High Involvement Work System Second-Order Factor Model (i.e., Vandenberg *et al.*, 1999), and it provided a moderate overall fit to the data, $\chi^2(197, N = 313) = 453.83, p < .05$; AGFI = .85; RMSEA = .06, $p = .035$; NNFI = .95; IFI = .95; PGFI = .69; ECVI = 1.83.

Insert Table 4 about here

The Opportunity, Motivation, and Skills Participation Model yielded a poor fit to the data, $\chi^2(192, N = 313) = 636.78, p < .001$; AGFI = .79; RMSEA = .09, $p < .05$; NNFI = .90; IFI = .92; PGFI = .64; ECVI = 2.46. Similarly, the Technical and Strategic HRM Bundles Model, $\chi^2(195, N = 313) = 598.07, p < .001$; AGFI = .81; RMSEA = .08, $p < .05$; NNFI = .91; IFI = .92; PGFI = .66; ECVI = 2.31, and the Skill Enhancement, Job Design, and Compensation Bundles Model, $\chi^2(193, N = 313) = 623.10, p < .001$; AGFI = .80; RMSEA = .09, $p < .05$; NNFI = .90; IFI = .92; PGFI = .64; ECVI = 2.40 also yielded poor absolute fit to the data.

The fit of these four models relative to each other was also evaluated, and the High Involvement Work System Second-Order Factor Model demonstrated the best fit of all four of the retained models. Specifically, the χ^2 difference test showed that the High Involvement Work System Second-Order Factor Model yielded a better fit than the Opportunity, Motivation, and Skills Participation Model, $\Delta\chi^2(5, N = 313) = 182.95, p < .01$; the Strategic and Technical HRM Model, $\Delta\chi^2(2, N = 313) = 144.24, p < .01$; and the Skill, Job Design, and Compensation Model, $\Delta\chi^2(4, N = 313) = 169.27, p < .01$.

As can be seen in Figure 1, the Second-Order Factor Model labelled ‘High Involvement Work Systems’ was positively correlated with job satisfaction ($\beta = .77, t = 12.79, p < .001$) and affective commitment ($\beta = .61, t = 10.06, p < .001$), thereby providing evidence of concurrent validity. The smaller negative relationship with continuance commitment ($\beta = -.16, t = -2.51, p < .05$) helps to support the model’s divergent validity.

Insert Figure 1 about here

One issue regarding these findings is the threat of mixed-level effects. More specifically, it is possible that some of the variance accounted for in the perceptions that specific practices exist in one's organization could be partially a result of membership in that organization. For example, if an employee perceives her organization to have extensive training, this could be partly explained by the fact that she works with other people in her organization who have had extensive training. To assess this plausible alternative explanation, we calculated a multiple analysis of variance using the organization as the independent variable and the average score for each of the eight high involvement work system items as the dependent variables. Further, intra-class correlations were calculated. Intra-class correlations (ICC1 and ICC2) provide a measure of the variance accounted for in each of the dependent variables by group membership and the reliability of the group measure (the minimum score is .70), respectively. Overall, there were significant differences between some of the ratings of the existence of practices across the organizations, $F(8, 290) = 3.87, p < .001$. As shown in Table 5, four of the eight variables (i.e., extensive training, teams and decentralized decision making, reduced status distinctions, and information sharing) reflecting employees' perceptions of the existence of high involvement work practices were partly explained by membership in one's organization.

Insert Table 5 about here

Perceived Effectiveness of High Involvement Work Practices

We first ran frequency analyses on each of the effectiveness items for which participants reported that they were at least “somewhat sure” that the practice in question (e.g., employment security) exists in their organization. For every practice that participants were at least somewhat certain it existed in their organization, a significant majority of participants for each item reflecting a given practice (i.e., minimum of 60%; maximum of 92%) rated that practice as at least “somewhat effective”. Stated differently, participants who perceived a practice to exist were also usually likely to perceive that practice to be effective. Zero-order correlation analyses were also computed between each of the items measuring the perceived presence of a practice with its corresponding effectiveness measure[7]. This analysis supported using the perceived absence of a practice as a proxy for ineffectiveness ($.56 < r < .92, ps < .001$).

We next computed a confirmatory factor analysis using maximum likelihood estimation as implemented in LISREL 8.54 (Jöreskog and Sörbom, 2003). We did not compute similar analyses for the three models focusing on the presence of different HR practices that provided poor fits to the data. The High Involvement Work System Second-Order Factor model would not converge because one of the reduced status distinction items had a very high standardized parameter estimate (Lambda X = 12.52). Generally, parameter estimates should not exceed unity as they can then result in the model running without calculating important fit indices, *t*-values, and suggested modification indices (Byrne, 1998). One plausible reason for the high standardized parameter estimate was that one of the reduced status distinction items (i.e., “Some organizational members have distinctive benefits (e.g., reserved parking, bigger offices, special titles)”) had very poor correlations with the other measures. Therefore, we freed a path between the two measurement items that reflected reduced status distinctions allowing them to co-vary.

When freeing up this parameter, the measurement model provided a good but not outstanding fit to the data: $\chi^2(155, N = 312) = 291.03, p < .001$; AGFI = .87; RMSEA = .05, $p = .27$; NNFI = .96; IFI = .97; PGFI = .56; ECVI = 1.58. There were neither theoretical nor empirical justifications for making further modifications to the measurement model; therefore, it was retained for the subsequent test of structural relations.

Concurrent Validity

In this stage, the High Involvement Work System Second-Order Factor Model was tested for concurrent validity using data reflecting participants' perceptions of the effectiveness of the high involvement management practices[8]. Like the analyses for the model of perceived presence of practices, job satisfaction and affective commitment were permitted to co-vary. The model demonstrated an adequate but not outstanding fit to the data, one that was similar to the fit found for the High Involvement Work System Second Order Factor Model for the perceived presence of practices, $\chi^2(198, N = 312) = 426.66, p < .001$; AGFI = .86; RMSEA = .06; $p < .05$; NNFI = .95; IFI = .96; PGFI = .70; ECVI = 1.74. The suggested modification indices indicated no post-hoc justifications for altering the model any further.

As shown in Figure 2 and consistent with the perceived presence of practices, the perceptions of the effectiveness of the eight practices, all of which loaded significantly onto the second order variable labelled 'High Involvement Work Systems', were positively correlated with job satisfaction ($\beta = .75, t = 12.31, p < .01$) and affective commitment ($\beta = .57, t = 9.45, p < .01$) and negatively associated with continuance commitment ($\beta = -.12, t = -2.41, p < .05$). Moreover, each of eight first order latent variables significantly loaded onto the second order variable labelled High Involvement Work Systems. There were some similarities and differences

from what was found with the perceived presence of practices. Consistent with our findings for the presence of practices, transformational leadership ($\beta = .73, t = 12.93, p < .01$) had the strongest relationship to the second-order factor. Training ($\beta = .86, t = 11.70, p < .01$) and employment security ($\beta = .66, t = 9.33, p < .01$) followed. The remaining factors had the following loadings in decreasing order of magnitude: selective hiring ($\beta = .73, t = 8.78, p < .01$), teams ($\beta = .71, t = 8.51, p < .01$), reduced status distinctions ($\beta = .41, t = 6.65, p < .01$), compensation ($\beta = .23, t = 4.71, p < .01$), and information sharing ($\beta = .70, t = 4.33, p < .01$)

Insert Figure 2 about here

DISCUSSION

The results of this research make several contributions to our understanding of the underlying nature of high involvement work systems from an employee perspective. First, the High Involvement Work System Second-Order Factor Model for both the perceived presence and effectiveness of the eight high involvement work practices (i.e., employment security, selective hiring, extensive training, contingent compensation, teams and decentralized decision-making, reduced status distinctions, information sharing, and transformational leadership) was supported. This is important, as this study is the first of its kind to (a) conduct a comparative test of a number of proposed models of high involvement work systems, (b) use scales (with one exception) of these practice perceptions that were internally consistent (Wright *et al.*, 2001), and (c) measure each of the high involvement work practices with multiple items (Becker and Huselid, 1998), making the results more compelling than prior research in which single-item

scales have often been used. In addition, this study differs from a majority of similar studies in that the measurement of the high involvement work practices was garnered from employees rather than from senior managers. This is a critical distinction as it is arguably the employees' perceptions of the presence and effectiveness of these practices that directly links to expected employee-level and organizational outcomes (e.g., Liao, Toya, Lepak, & Hong, 2009; Vandenberg *et al.*, 1999; Wall and Wood, 2005; Zacharatos *et al.*, 2005). One of the main criticisms of prior research was the assumption that employees' experience of human resource management practices was similar to managers' experiences of the same practices. Supporting this argument, Liao *et al.* (2009) reported a disconnect between managers and employees perceptions of high involvement work system practices within their own organizations with managers perceiving a significantly higher level of these practices than reported by employees.

The results of the current research extend research on the nature and effectiveness of HR practices in a number of ways. First, we found evidence for a second-order factor structure that encompasses the individual and combined effects of all eight high involvement work practices. The results were largely similar for both the perceived presence and the perceived effectiveness of practices. A key contribution of our findings, then, is that we present a clearer picture of the separate effects of each practice on the entire system as operationalized at the employee level of analysis.

The results of this study also replicate the findings of a small but growing literature (e.g., Edgar and Geare, 2005; Hartline and Ferrell, 1996; Hoque, 1999; Vandenberg *et al.*, 1999; Zacharatos *et al.*, 2005) showing the effects of HR systems on employee attitudes. We found that perceiving one's organization to have high involvement work systems, and seeing that these

practices are effective predicts higher levels of both job satisfaction and affective commitment, and lower levels of continuance commitment. The results of this research are consistent with the findings of other research that report positive relationships between high involvement work systems and job satisfaction (e.g., Barling *et al.*, 2003), affective commitment (e.g., Ramsay *et al.*, 2000; Vandenberg *et al.*, 1999), and trust in management (e.g., Zacharatos *et al.*, 2005).

It is noteworthy that some of the practices had relatively stronger effects than others, and there are a number of issues worth noting when interpreting these findings. First, transformational leadership had the largest contribution to the overall model for both presence and effectiveness. Although the measure of transformational leadership had the same number of subscales (i.e., two) as the other seven factors, it was calculated by combining eight separate items as compared to a maximum of four items that made up the other factors. As a result, the reliability of the transformational leadership scale was greater than that found for a majority of the other scales used. In addition, it can be argued that asking respondents about their perceptions of their immediate supervisor, and then comparing these responses to other questions that require respondents to report on organizational level practices may represent an unfair comparison (Cooper and Richardson, 1986) in terms of the social saliency of the referent. One might expect more definitive responses about individuals with whom employees interact on a daily basis than with less salient features such as organizational practices. Although leadership has been identified in previous research (e.g., Zacharatos *et al.*, 2005) as a critical feature of high involvement work systems, subsequent research should modify scale items to represent a fairer comparison to organization-level activities. One approach would be to define leadership at the organizational level (e.g., “leaders in my organization communicate enthusiastically about what

needs to be accomplished”) and then assess its relative contribution to understanding high involvement work systems.

There were also some differences in the pattern of results for the individual effects of each of the high involvement work practices for the presence and perceived effectiveness of these practices, supporting the need to conceptualize and operationalize two aspects separately. As Zacharatos *et al.* (2005) suggested, we need to understand not only the organizational effects of having high involvement work systems, but also to understand how these effects are occurring. In the present sample, the two most common practices as reported by respondents were transformational leadership and selective hiring. Aside from transformational leadership, the practices deemed to account for most of the variance in high involvement work systems when examining both models (presence and effectiveness) were extensive training and selective hiring. Extensive training, nonetheless, was only perceived to exist by 18.6% of the sample compared to 55.4% perceiving selective hiring to exist. The role of employment security differed mostly between the presence and effectiveness models. One plausible explanation is that few people perceive employment security to exist in their organizations. However, when it is perceived to exist, it is perceived as important in effective high involvement work systems.

From a practitioner perspective, a critical implication of these findings is that the more employees perceive their organizations to use high involvement work practices (such as employment security and training), the more likely they will feel emotionally attached and satisfied with their jobs and organizations. Second, the results of this research suggest the importance of strategically implementing a system of human resource management rather than just providing one or two practices in isolation.

Limitations and future directions for research

There are a number of limitations in this research worth noting. First, this study relied entirely on self-report data collected from a convenience sample of employees. These features of the sample increase the likelihood of mono-method bias and limit the generalizability or representativeness of the resulting model. Nonetheless, given that we were interested in employees' perceptions, self-report data was the only option available for measuring the organizational practices and job satisfaction, as well as affective and continuance commitment. In addition, we sourced employees from five different organizations, which helped to mitigate the possibility that there was a restricted range of organizational practices on which employees could report. Although we recognize a concern with mono-method bias, we believe its effects on the results of this research are minimal for two reasons. First, it has been argued that mono-method bias does not occur as frequently as one might assume (Crampton and Wagner, 1994). While some areas of micro-organizational behaviour research may be somewhat more prone to inflation of relationships (i.e., variables dealing with attitudes, values, and personality), others such as variables measuring organizational structure and policies (e.g., pay and benefits, training, goal-setting) are "...relatively free of effect-size inflation" (p. 72). In a critique of the extant HR-performance research, Wall and Wood (2005) admit this may in fact be true for "self-report performance data" (Wall and Wood, 2005, p. 12), which may not be as biased as originally believed. However, in future research, data from senior-level managers about the high involvement work practices in their organizations should be collected, and then linked to employee perceptions of these same practices.

Second, the reliabilities of most of the measures ranged between acceptable and

excellent. Two measures showing unacceptable reliability, however, were the presence of reduced status distinctions ($\alpha = .15$) and perceived effectiveness of reduced status distinctions ($\alpha = .67$). We calculated the measurement models with and without the items reflecting employees' perceptions of the presence of reduced status distinctions and found no significant difference in the models' relative fit. Nonetheless, there did not seem to be an *a priori* theoretical rationale for excluding this practice from models of high involvement, but future research should focus on providing more reliable measures of reduced status distinctions. In addition, clarifying what "effectiveness" means may help to increase the internal consistency of the organizational practice scales. Asking employees whether a practice is effective assumes a common understanding of what the objectives of the particular organizational practice are, and that they are able to judge accurately how that practice meets those objectives. Ensuring explicit objectives and a shared basis for understanding "effectiveness" will be valuable in future research. Although Delery (1998) argued against Cronbach's alpha being an appropriate indicator of high involvement work systems, he does so based on the usual practice in prior research (e.g., Becker and Huselid, 1998; Huselid, 1995; Zacharatos *et al.*, 2005) of using combined scores on single items, each of which reflect different human resource management practices (e.g., information sharing, extensive training) as one should not expect them to show high intercorrelations. For example, an employee working in an organization who perceives a high level of training may not necessarily also perceive there to be employment security. In the current study, however, we measured each separate practice (i.e., employment security, selective hiring, etc.) with multiple items and did show, with the exception of reduced status distinctions, acceptable to excellent internal reliabilities. Nonetheless, we do acknowledge that the current

approach has its limitations as do all methods used to date (i.e., cluster analysis, Becker and Gerhart, 1996; deviation scores, Delery and Doty, 1996; and the use of interactions, Delery, Gupta, and Shaw, 1998).

Third, and in relation to the previous limitation, Becker and Huselid (1998, p. 64) argued against the use of individual scales and suggest that a more appropriate measure of high involvement work systems would be to calculate an overall index creating by the "...summation of the individual elements of the HRM systems". Although this approach has its merits, we specifically and purposefully chose not to follow it as this would not have allowed us to disentangle the relative influences of each practice on the overall system. Further, Delery (1998) suggested that future research in this area measure each of the high involvement work practices with multiple items and calculate the internal consistencies of each subscale.

A fourth issue that needs addressing is the unequal sample sizes between participants' perceptions of the presence and the effectiveness of the eight high involvement work practices. In some cases (e.g., contingent compensation), the pairwise deletions resulted in dramatically truncated samples. This was because the effectiveness perceptions of each practice were coded as "1 = extremely ineffective" in cases in which participants were less than somewhat sure that that practice existed in their respective organizations. Although a limitation, this approach was necessary to ensure a clearer sense of the differences between perceiving practices to exist versus perceiving these practices to be effective. One approach to mitigating this limitation would be to select organizations that are known to have high involvement work practices, and then ask organizational members for their effectiveness perceptions of these practices. Another would be to obtain a sufficiently large sample so that listwise deletions results in a large enough sample.

As Wall and Wood (2005) suggest, however, access and budget constraints often make this a difficult proposition. One final approach could be to adjust the scales of the effectiveness items so that one of the forced choices would be 'not applicable' as an example. This approach is fraught with its own limitations, as it does not differentiate between the perceived existence and the perceived effectiveness of the practices in question. Although the approach taken in this research has its limitations, it does highlight the fact that, at least in this sample, organizations are doing quite a poor job of either communicating the existence of various high involvement work practices, implementing them, or both.

Fifth, the models tested in this research were measured with individual level data (i.e., employee level perceptions of practices). However, the models were gleaned from previous studies in which data were collected at the individual, group, or organizational level. For example, Huselid et al. (1997) developed their model based on a survey of managers' perceptions of their organizations' HR practices (individual level of analysis). Conversely, Patterson et al. (2004) measured high involvement work practices at the organizational level (i.e., data gathered from the organizational records). As a result, it is advisable that subsequent research be conducted to test the model supported in this research at each level of analysis to assess similarities and differences in fit. It would also be of value to conduct research that tests various models using multiple levels of analyses within one set of data (the small number of organizations in the current study precluded this type of analysis).

Finally, the models developed and tested in this research were based on high involvement approaches. Future research might explore the structure and effects of traditional control-oriented HR practices, and how they relate to employee attitudes and organizational outcomes.

Although Arthur (1994) compared cost-control versus high commitment organizations, no other research has attempted to contrast the effects that traditional versus progressive human resource management practices have on employee-level attitudes and behaviour.

Concluding Thoughts

A growing body of research continues to demonstrate the positive effects of high involvement work systems on various employee- and organizational-level outcomes; however, there remains a paucity of research on the nature of a high involvement work system. The primary contribution of this research was to conduct a fair comparison of previously proposed models of high involvement work systems. The current research contributes to understanding how employee attitudes are affected by perceptions of organizational practices designed to treat employees as people rather than costs to be controlled.

FOOTNOTES

¹ Due to space limitations, we direct the reader to review Pfeffer (1998) for a thorough explanation and rationale for his choice of the seven high performance work practices.

² Edwards and Wright (2001) make a compelling argument for a possible reciprocal relationship between high involvement work systems and performance. More specifically, they suggested that in addition to high involvement work practices leading to positive employee and organizational outcomes, that perhaps highly performing organizations are also more likely and able to afford these costly human resource management practices. In the current research, although we did not test for the directionality of the relationships between high involvement work systems and outcomes, the possibility of a bidirectional relationship only serves to further the argument of a significant relationship regardless of which variable is the antecedent and which one is the outcome. Further, we did not attempt to test for the directionality of the relationship between these systems and organizational outcomes as the current study relies on cross-sectional data.

³ There were a number of reasons why we asked managers to distribute the invitation to employees instead of contacting them directly. First, it would have been difficult to acquire contact information of individual employees. Second, we did not believe it ethical to get approval for our research from decision makers in the organization. Third, we believe that employees would have been reluctant to complete the survey without the expressed approval of management.

⁴ In Canada, a Crown corporation is a public organization established and run by a provincial or the federal government.

⁵ Items shown in Appendix A that are in italics are those not included in the analysis as they most negatively impacted the reliabilities of their respective scales.

⁶ The measurement model was run a second time excluding these two items. However, a $\Delta\chi^2$ test did not yield a significant difference between the two measurement models.

⁷ We first ran the structural model without coding any of the missing effectiveness data. However, the model failed to converge. We then changed each of the missing responses that were a result of participants answering 1 to 4 on the presence scale to a 4 (neither effective nor ineffective) on the effectiveness scale. Virtually the same results were found by coding each of the missing effectiveness data with a 1 (extremely ineffective).

⁸ All three of the Bundles Models did not fit the data as well as the Second Order Factor Model. Furthermore, none of the bundle models demonstrated concurrent validity.

⁹ Paths that allow the criterion latent variables to covary are reflected in the models tested, but not drawn in the Figures for ease of presentation. * $p < .05$, ** $p < .01$.

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TABLE 1
Summary of Tested Models

<i>Model Name</i>	<i>Example Authors</i>	<i>Model Description</i>
High Involvement Work System First Order Factor Model	Zacharatos <i>et al.</i> (2005)	All eight HR practices (i.e., employment security, selective hiring, contingent compensation, extensive training, reduced status distinctions, information sharing, and transformational leadership) load onto one first order construct labelled a High Involvement Work System
High Involvement Work System Second Order Factor Model	Vandenberg <i>et al.</i> (1999)	All eight HR practices (same as above) load onto their respective first order latent constructs. These eight first order constructs then load onto a second order construct labelled a High Involvement Work System
Opportunity, Motivation, and Skill Participation Model	Bailey <i>et al.</i> (2001)	The Opportunity to Participate Bundle includes information sharing, reduced status distinctions, and teams. The Motivation to Participate Bundle includes contingent compensation, employment security, and transformational leadership. The Effective Skills to Participate Bundle includes extensive training and selective hiring.
Technical and Strategic Human Resources Management Bundles Model	Huselid <i>et al.</i> (1997)	The Strategic HRM Bundle includes teams, employment sanctuary, reduced status distinctions, information sharing, and transformational leadership. The Technical HRM Bundle includes selective hiring, contingent compensation, and extensive training.
Skill Enhancement, Job Design, and Compensation Bundles Model	Patterson <i>et al.</i> (2004)	The Skill Enhancement Bundle includes selective hiring and extensive training. The Job Design Bundle includes reduced status distinctions, teams, transformational leadership, information sharing, and employment security. The Compensation Bundle is comprised of contingent compensation.

TABLE 2

Descriptive Statistics and Inter-correlations of Perceived Presence of High Involvement Work Practices and Employee Attitudes (N = 313)

VAR	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Age	40.1	10.4	(--)																	
Sex	1.6	.5	-.27 ^b	(--)																
Yrs	5.9	3.2	.64 ^b	-.24 ^b	(--)															
F/P	1.1	.26	-.02	.12 ^a	-.16 ^b	(--)														
Size	7.4	1.6	.03	-.02	.20 ^b	-.13 ^a	(--)													
AOrg	11.2	2.0	-.01	-.05	.23 ^b	-.21 ^b	.29 ^b	(--)												
Un	1.6	.5	-.09	-.04	-.27 ^b	.04	-.01	.01	(--)											
ES	4.3	1.2	-.10	.06	-.04	.12 ^a	-.05	.01	.07	(.63)										
SH	5.2	1.3	-.03	.04	-.15 ^b	.15 ^b	-.12 ^a	-.15 ^b	.09	.27 ^b	(.69)									
CC	1.9	1.2	-.28 ^b	.18 ^b	-.31 ^b	.06	.05	-.06	.12 ^a	.26 ^b	.13 ^a	(.58)								
ET	3.7	1.4	-.09	.03	-.13 ^a	.16 ^b	-.05	-.20 ^b	-.07	.35 ^b	.36 ^b	.40 ^b	(.69)							
TE	4.2	1.3	-.13 ^a	.08	-.18 ^b	.10	-.04	-.29 ^b	.18 ^b	.18 ^b	.33 ^b	.28 ^b	.45 ^b	(.69)						
RSD	3.0	1.4	.02	.09	-.08	.04	-.19 ^b	-.23 ^b	.00	.01	.08	.09	.09	.06	(.15)					
IS	3.8	1.6	-.18 ^b	.07	-.19 ^b	.15 ^b	-.11	-.15 ^b	.02	.34 ^b	.27 ^b	.30 ^b	.45 ^b	.41 ^b	.01	(.62)				
TL	4.9	1.7	-.07	.07	-.14 ^a	.13 ^a	.00	-.05	.19 ^b	.31 ^b	.36 ^b	.22 ^b	.38 ^b	.37 ^b	.04	.38 ^b	(.94)			
JS	4.8	1.0	-.12 ^a	.08	-.21 ^b	.15 ^a	-.07	-.08	.21 ^b	.40 ^b	.34 ^b	.27 ^b	.41 ^b	.33 ^b	.10	.34 ^b	.65 ^b	(.90)		
AC	4.4	1.2	-.03	.03	-.07	.04	-.01	.09	.15 ^a	.32 ^b	.25 ^b	.16 ^b	.36 ^b	.24 ^b	.10	.24 ^b	.54 ^b	.66 ^b	(.87)	
ConC	4.5	1.2	.18 ^b	.00	.37 ^b	-.03	.13 ^a	.01	-.26 ^b	-.09	-.07	-.09	-.05	-.01	.10	.05	-.19 ^b	-.16 ^b	.19 ^a	(.82)

Note. Cronbach's alphas appear on the diagonal in parentheses. * Sex; Male = 1; Female = 2. ** F/P; Full-time = 1, Part-time = 2. ^a = $p < .05$; ^b = $p < .01$. Yrs = years in the organization; F/P = Full or Part-Time; Size = Org. Size; AOrg = Age of Organization; Un = Unionized or non-unionized; ES = Employment Security; SH = Selective Hiring; CC = Contingent Compensation; ET = Extensive Training; TE = Teams and Decentralized Decision Making; RSD = Reduced Status Distinctions; IS = Information Sharing; TL = Transformational Leadership; JS = Job Satisfaction; AC = Affective Commitment; ConC = Continuance Commitment.

TABLE 3

Descriptive Statistics and Inter-correlations of Perceived Effectiveness of High Involvement Work Practices and Employee

Attitudes (N =313^c)

VAR	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Age	40.1	10.4	(--)																	
Sex*	1.6	.49	-.27 ^b	(--)																
Yrs	5.9	3.2	.64 ^b	-.24 ^b	(--)															
F/P**	1.1	.26	-.02	.12 ^a	-.16 ^b	(--)														
Size	7.4	1.6	.03	-.02	.20 ^b	-.13 ^a	(--)													
AOrg	11.2	2.0	-.01	-.05	.23 ^b	-.21 ^b	.29 ^b	(--)												
Un	1.6	.49	-.09	-.04	-.27 ^b	.04	-.01	.01	(--)											
ES	5.1	1.0	-.02	.03	.05	.15 ^a	-.07	.01	.07	(.82)										
SH	5.0	1.1	-.10	.11	-.20 ^b	.17 ^b	-.13 ^a	-.15 ^b	.09	.36 ^b	(.72)									
CC	3.8	1.7	-.07	.01	-.08	-.07	.06	-.06	.12 ^a	.40 ^b	.18	(.90)								
ET	4.8	1.3	-.09	.07	-.10	.19 ^b	-.07	-.20 ^b	-.07	.34 ^b	.45 ^b	.77 ^b	(.86)							
TE	4.9	1.2	-.16 ^b	.10	-.20 ^b	.12 ^a	-.14 ^a	-.29 ^b	.18 ^b	.31 ^b	.47 ^b	.56 ^b	.49 ^b	(.87)						
RSD	4.1	1.1	-.04	.00	-.05	.00	-.09	-.23 ^b	.00	-.10	.01	-.09	.03	-.05	(.67)					
IS	4.6	1.2	-.17 ^b	.06	-.20 ^b	.21 ^b	-.15 ^a	-.15 ^b	.02	.29 ^b	.34 ^b	.69 ^b	.42 ^b	.46 ^b	.04	(.77)				
TL	5.2	1.2	-.10	.14 ^a	-.16 ^b	.15 ^a	-.07	-.05	.19 ^b	.43 ^b	.44 ^b	.54 ^b	.50 ^b	.49 ^b	-.05	.39 ^b	(.95)			
JS	4.8	1.0	-.12 ^a	.08	-.21 ^b	.15 ^a	-.07	-.08	.21 ^b	.36 ^b	.37 ^b	.53 ^b	.44 ^b	.50 ^b	-.10	.42 ^b	.39 ^b	(.90)		
AC	4.4	1.2	-.03	.03	-.07	.04	-.01	.09	.15 ^a	.24 ^b	.29 ^b	.33 ^b	.25 ^b	.31 ^b	-.04	.33 ^b	.42 ^b	.66 ^b	(.87)	
COC	4.5	1.2	.18 ^b	.00	.37 ^b	-.03	.13 ^a	.01	-.26 ^b	-.08	-.06	-.23	-.02	-.17 ^b	.07	-.03	-.13 ^a	-.16 ^b	-.19 ^b	(.82)

Note. Cronbach's alphas appear on the diagonal in parentheses.* Sex; Male = 1; Female = 2. ** F/P; Full-time = 1, Part-time = 2. ^a = $p < .05$; ^b = $p < .01$.^c pair-wise deletion was computed resulting in unequal sample sizes for each variable. Cronbach's alphas appear on the diagonal in parentheses. VAR = Variable. (Yrs = years in the organization; F/P = Full or Part-Time; Size = Org. Size; AOrg = Age of Organization; Un = Unionized or non-unionized; ES = Employment Security, SH = Selective Hiring, CC = Contingent Compensation, ET = Extensive Training, TED = Teams and Decentralized Decision-Making, RSD = Reduced Status Distinctions, IS = Information Sharing, TE = Transformational Leadership, JS = Job Satisfaction, AC = Affective Commitment, COC = Continuance Commitment)

TABLE 4**Chi-Square Tests and Fit Indices for the Four Models of the Perceived Presence of High Involvement Work Practices (N=313).**

<i>Mode</i>	χ^2	<i>df</i>	<i>ECVI</i>	<i>AGFI</i>	<i>RMSEA</i>	<i>NNFI</i>	<i>IFI</i>	<i>PGFI</i>
Second Order High Involvement Work System Factor Model	453.83***	197	1.83	.85	.06	.95	.95	.69
Opportunity, Motivation, and Skill Enhancement Participation Model	636.78***	192	2.46	.79	.09	.90	.92	.64
Strategic and Technical Human Resources Management Model	598.07***	195	2.31	.81	.08	.91	.92	.66
Skill, Job Design, and Compensation Model	623.10***	193	2.40	.80	.09	.90	.92	.64

Note. ECVI = Expected Cross-Validation Index; AGFI = Adjusted Goodness of Fit Index; RMSEA = Root Mean Squared Error of Approximation; NNFI = Non-Normed Fit Index; IFI = Incremental Fit Index; PGFI = Parsimony Goodness of Fit Index. *** $p < .001$

TABLE 5

Analysis of Variance for Between and Intra-class Correlations of Organizational Differences on High Involvement Work Practices (*df* = 302)

Source	DV	F (4, 297 ^a)	ICC1 ^b	ICC2
Organization	Employment Security	.84	0	0
	Selective Hiring	1.2	0	0
	Contingent Compensation	1.7	0	0
	Extensive Training	5.6*	.07	.82
	Teams and Decentralized Decision Making	9.5*	.12	.89
	Reduced Status Distinctions	7.4*	.09	.86
	Information Sharing	7.4*	.09	.85
	Transformational Leadership	.74	0	0

$p < .001$

^a One of the organizations in this study was excluded from this analysis because it had of its small sample size ($n = 4$).

^b Represented the proportion of variance accounted for in the DV by membership in one's organization.

FIGURE 1

High Involvement Work System Second Order Factor Structure Model: Perceptions of the Presence[8]

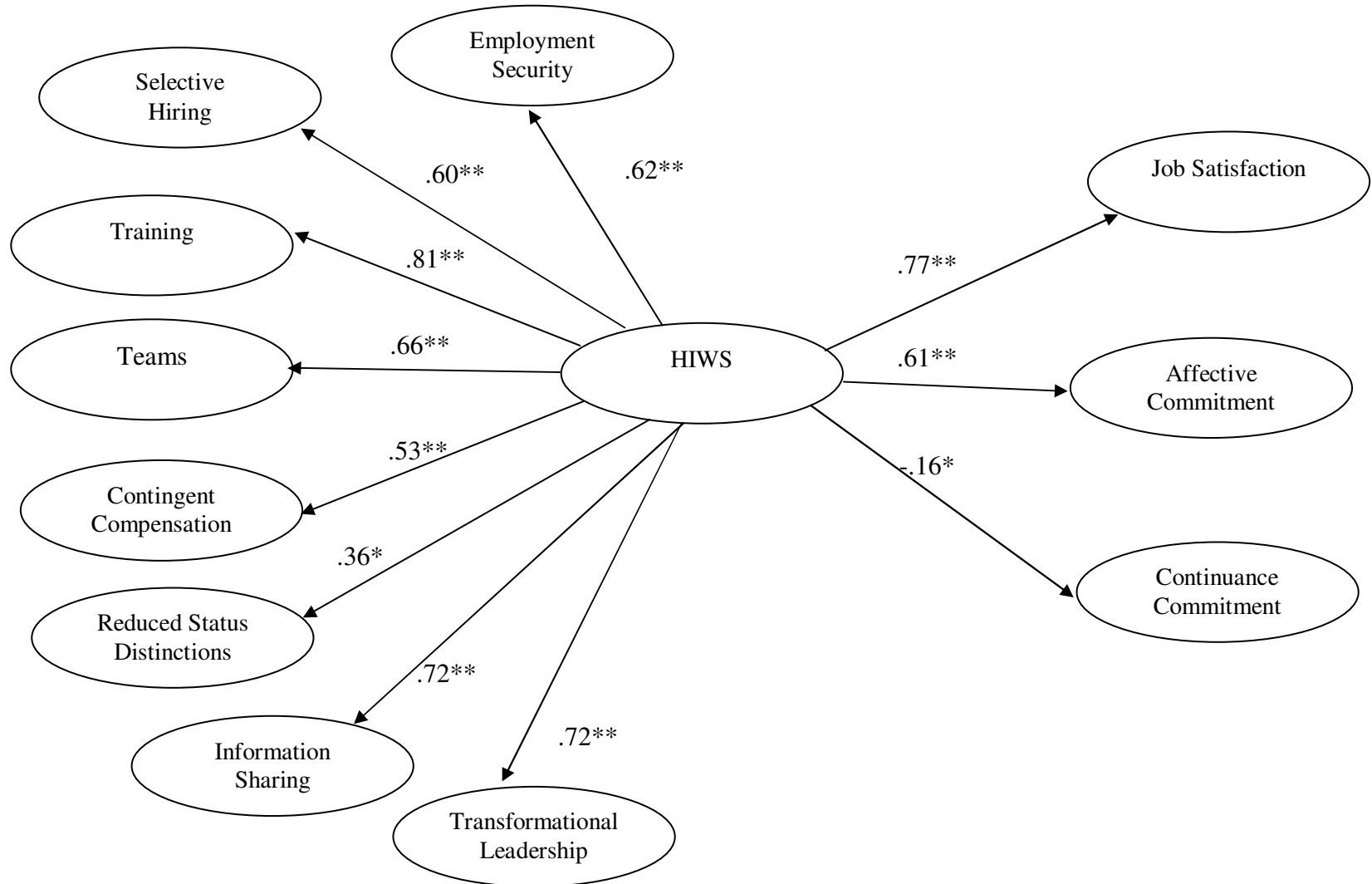
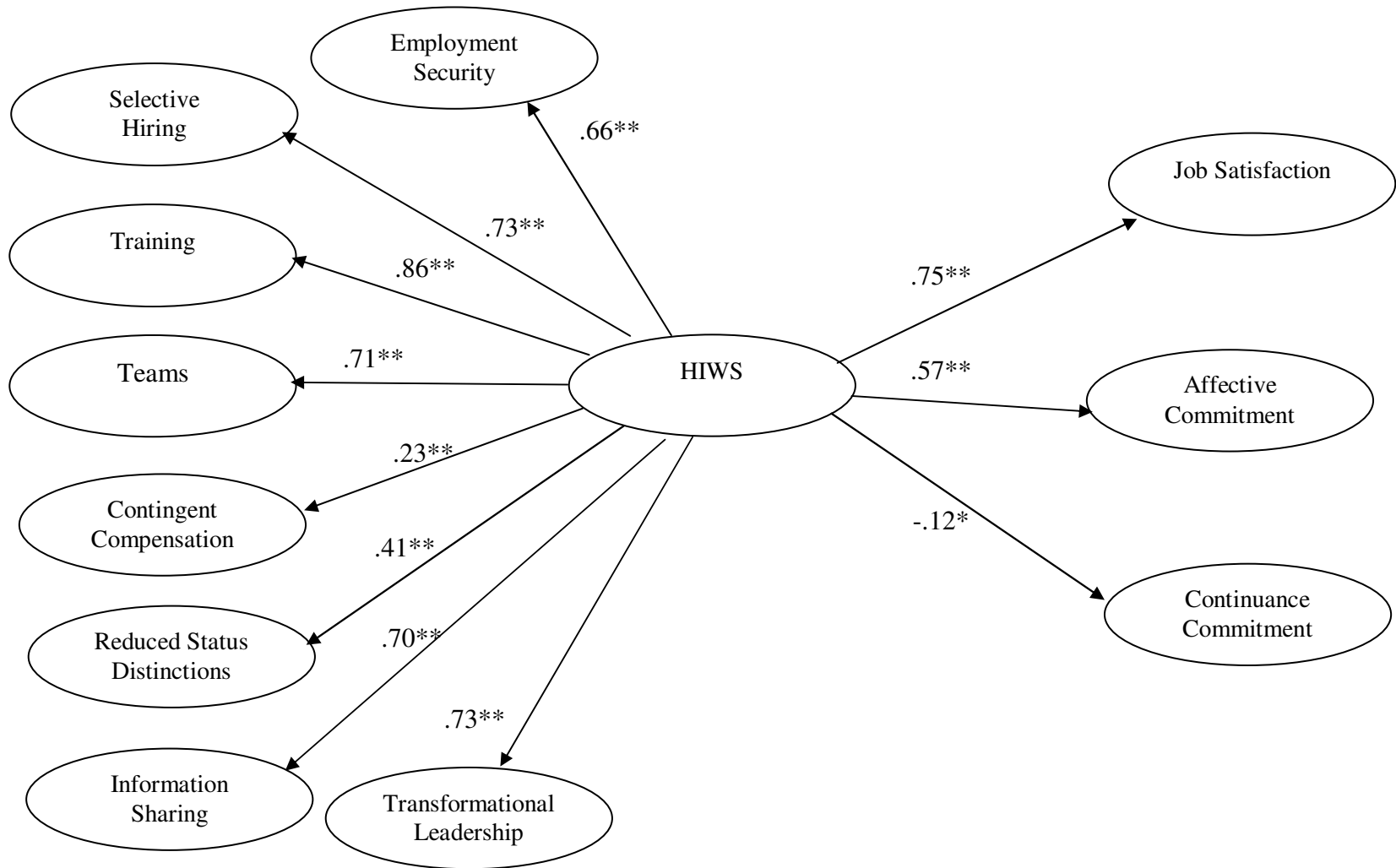


FIGURE 2

High Involvement Work System Second Order Factor Structure Model: Perceptions of Effectiveness[9]



APPENDIX A*

Scale items, sources, and reliabilities for the presence and effectiveness data.

<i>Measure</i>	<i>Source</i>
<p>Employment Security ($\alpha_{\text{presence}} = .63$; $\alpha_{\text{effectiveness}} = .82$)</p> <ul style="list-style-type: none"> -My organization has a commitment to avoid laying off core employees. -My organization uses temporary staff for the primary purpose of protecting the job security of the core workforce. -My organization has a permanent employment policy, such that there is the expectation that when all new employees join the firm, they will stay until retirement. -My organization attempts to promote a sense of employment security for productive core employees. 	<ul style="list-style-type: none"> -Wood (1999a) -Wood (1999a) -Wood and Albanese (1995) -Developed for this study
<p>Selective Hiring ($\alpha_{\text{presence}} = .69$; $\alpha_{\text{effectiveness}} = .72$)</p> <ul style="list-style-type: none"> -In the recruitment and selection process, my organization assesses candidates' interpersonal skills. -Prospective employees' attitude to teamwork is an important selection criterion. <i>-The organization for which I work uses trainability as one of its selection criteria.</i> <i>-My organization uses realistic job previews during its selection process.</i> 	<ul style="list-style-type: none"> -Wood (1999a) -Wood and Albanese (1995) -Hoque (1999) -Hoque (1999)

<p>Teams and Decentralized Decision Making ($\alpha_{\text{presence}} = .69$; $\alpha_{\text{effectiveness}} = .87$)</p> <ul style="list-style-type: none"> -Teams meet on a regular basis. -Leaderless teams are used in my organization. -There is a team-based culture fostered in my organization. -The work is organised around teams for a majority of staff. 	<ul style="list-style-type: none"> -Wood (1999a) -Developed for this study -Developed for this study -Developed for this study
<p>Extensive Training ($\alpha_{\text{presence}} = .69$; $\alpha_{\text{effectiveness}} = .86$)</p> <ul style="list-style-type: none"> -There is an explicit policy requiring all staff to spend a minimum period each year in formal training. -There is a deliberate attempt in my place of work to create a learning organization. -My organization offers cross-training (i.e., training on how to do other jobs within the organization). -My organization sets aside training budgets with at least a two years' financial horizon. 	<ul style="list-style-type: none"> -Hoque (1999) -Hoque (1999) -Wood (1999a) -Wood and Albanese (1995)
<p>Reduced Status Distinctions ($\alpha_{\text{presence}} = .15$; $\alpha_{\text{effectiveness}} = .67$)</p> <ul style="list-style-type: none"> -There are very few visible status distinctions between employees and managers at all levels. -Some organizational members have distinctive benefits (e.g., reserved parking, bigger offices, special titles; reverse coded). <i>-There are many hierarchical levels between the lowest and highest positions in my organization (reverse coded).</i> <i>-Promotions are based largely on merit rather seniority.</i> 	<ul style="list-style-type: none"> -Developed for this study -Developed for this study -Developed for this study -Huselid (1995)
<p>Contingent Compensation ($\alpha_{\text{presence}} = .58$; $\alpha_{\text{effectiveness}} = .90$)</p> <ul style="list-style-type: none"> -The organization for which I work provides a team-based merit pay element to staff at all levels. -My organization offers employees gain sharing plans (i.e., cost savings from improvements in productivity and lower waste passed on to employees). 	<ul style="list-style-type: none"> -Wood and Albanese (1995) -Developed for this study

<p>Information Sharing (α presence = .62; α effectiveness = .77)</p> <p>-Staff are informed about the market position, competitive pressures and establishment and company performance as a matter of course. -There are regular meetings or a cascade of information from senior management to frontline staff during which time, work stops.</p> <p><i>-The salary structure of my organization is openly communicated.</i> <i>-It is easy for any organizational member to find out how productive his or her work group has been.</i></p>	<p>- Hoque (1999)</p> <p>-Wood and Albanese (1995)</p> <p>-Wood and de Menezes (1998)</p> <p>-Wood and de Menezes (1998)</p>
<p>Transformational Leadership (α presence = .94; α effectiveness = .95)</p> <p>-My boss (i.e., immediate supervisor or team leader) instils pride in being associated with him/her. -My boss (i.e., immediate supervisor or team leader) goes beyond his/her own self-interest for the good of our group. -My boss (i.e., immediate supervisor or team leader) expresses his/her confidence that we will achieve our goals. -My boss (i.e., immediate supervisor or team leader) talks enthusiastically about what needs to be accomplished. -My boss (i.e., immediate supervisor or team leader) gets me to look at problems from many different angles -My boss (i.e., immediate supervisor or team leader) seeks differing perspectives when solving problems. -My boss (i.e., immediate supervisor or team leader) treats me as an individual rather than just a member of a group -My boss (i.e., immediate supervisor or team leader) spends time teaching and coaching me.</p>	<p>Bass and Avolio (1995)</p>

<p>Job Satisfaction^a ($\alpha_{\text{presence}} = .90$; $\alpha_{\text{effectiveness}} = .90$)</p> <p>-At your place of work, how satisfied are you with the physical working conditions? -At your place of work, how satisfied are you with the freedom to choose your own method of working?</p>	<p>See Warr <i>et al.</i> (1979) for full 15 item scale</p>
<p>Affective Commitment^a ($\alpha_{\text{presence}} = .87$; $\alpha_{\text{effectiveness}} = .87$)</p> <p>- I would be very happy to spend the rest of my career in this organization. - I enjoy discussing my organization with people outside of it.</p>	<p>Allen and Meyer (1990) for full 8 item scale</p>
<p>Continuance Commitment^a ($\alpha_{\text{presence}} = .82$; $\alpha_{\text{effectiveness}} = .82$)</p> <p>- Right now, staying with my organization is a matter of necessity as much as desire. - I believe that I have too few options to consider leaving this organization.</p>	<p>Allen and Meyer (1990) for full 9 item scale</p>

* Items in italics were not retained for any of the analyses as they most negatively impacted upon the internal consistency of each of their respective scales.

^a Job Satisfaction and Affective and Continuance Commitment were only measured one time resulting in the same reliabilities for the presence and effectiveness data.