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Assessing the impact of healthy work organization intervention

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This research evaluates a healthy work organization intervention implemented in a retail setting. Using a participatory process, employee teams in 11 intervention stores developed customized plans for improving work organization at their sites. Ten comparable stores served as controls. Employee surveys were administered prior to the intervention and twice again at 12-month intervals. Business results were compiled monthly for each store. The baseline data were used by the teams to identify needs and establish action priorities for their stores. Most study outcomes declined across time for all stores, due primarily to internal corporate events and a generally adverse economic environment. However, the intervention process appeared to buffer some of these declines; intervention stores fared better in terms of selected aspects of organizational climate and psychological work adjustment. Intervention stores also performed better than controls on general indices of perceived health and safety and two of the four business outcomes: employee turnover and sales per labour hour. These results are discussed in terms of the challenges involved in evaluating organizational-level interventions in work settings.

The organization of work in modern economies has been dramatically transformed during the past two decades in response to a complex array of economic, technological, legal, political, and sociocultural forces. Many organizations have restructured and/or downsized their workforces, outsourced or off-shored business functions or entire operations, and altered work and hiring policies to enhance flexibility and lower costs. Leaner and flatter organizational structures have been instituted, accompanied by various 'high performance' or 'lean production' strategies designed to boost

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productivity. For most advanced industrial countries, these changes have occurred as workforces have become substantially older and more diverse. Employees are now asked to assume greater personal responsibility for managing their jobs and careers, including decisions about health benefits, retirement planning, and maximizing future employability. The scope and magnitude of these changes have outpaced our understanding of their implications for quality of work life and occupational safety and health (Aronsson, 1999; Landsbergis, 2003; National Institute for Occupational Safety and Health [NIOSH], 2002).

Work organization is a broad term that refers to the way work processes are structured and managed, such as job design, scheduling, management, organizational characteristics, and policies and procedures. The term 'healthy work organization' is a logical extension of work organization and assumes that it should be possible to distinguish healthy from unhealthy work systems (e.g. Cooper & Williams, 1994; Cox, 1988; Danna & Griffin, 1999; Jaffe, 1995; Landsbergis, 2003; Lowe, Schellenberg, & Shannon, 2003; Smith, Kaminstein, & Makadok, 1995; Sparks, Faragher, & Cooper, 2001). Presumably, creating healthier organizations should be good for both employees and bottom-line business performance

A number of conceptual models of healthy work organization have been proposed. Cox, Leather, and Cox (1990) argued that the study of work and health should be expanded to include the organizational context. They identified three primary sources of work demands: the work itself, the tools and technologies used in the work, and the social/organizational and physical environments in which the work is performed. Smith *et al.* (1995) examined five organizational factors: organization–person balance, organizational treatment, discrimination, decision-making climate, and quality of supervision. Sauter, Lim, and Murphy (1996) identified management practices, organizational culture/climate, and organizational values as key organizational factors. Danna and Griffin (1999) proposed an antecedents–consequences a model featuring three sets of antecedent factors: work setting (primarily safety and health risks), personality traits, and occupational stress factors. In this model, occupational stress factors encompass both job demands and broader organizational characteristics such as climate and career development opportunities. NIOSH has adopted a multi-level or ecological approach that features three interacting tiers (Landsbergis, 2003; NIOSH, 2002): the external context (economics, political trends, etc.), the organizational context (management structures, etc.), and work content (job characteristics, work-roles, etc.). DeJoy, Wilson, and colleagues (DeJoy & Wilson, 2003; Wilson, DeJoy, Vandenberg, Richardson, & McGrath, 2004) focused on three domains of work life: job design, organizational climate, and job future and their relationships to the leadership and cultural resources of the organization.

While some of these models have been tested in cross-sectional studies (e.g. Sauter *et al.*, 1996; Smith *et al.*, 1995; Wilson *et al.*, 2004), the published literature contains very few controlled longitudinal tests of comprehensive work reorganization interventions (Aust & Ducki, 2004; Petterson & Arnetz, 1998). More common are intervention studies evaluating specific elements of work reorganization such as job control (e.g. Bond & Bunce, 2001); the introduction of specific operational systems such as team-based work-groups (e.g. Morgeson, Johnson, Campion, Medsker, & Mumford, 2006); the implementation of various structural changes such as downsizing (e.g. Parker, Chimiel, & Wall, 1997); or specific types or categories of outcomes such as musculoskeletal injuries (e.g. Carayon, Haims, Hoonakker, & Swanson, 2006). A number of studies in this literature would fall under the category of organizational job stress

interventions (Cox, Karanika, Griffiths, & Houdmont, 2007; Parkes & Sparkes, 1998). This body of research makes it clear that conducting intervention studies in real world work organizations presents a number of challenges to the researcher (Cox *et al.*, 2007; Goldenhar, LaMontange, Katz, Heaney, & Landbergis, 2001; NIOSH, 2002; Parkes & Sparkes, 1998).

The present study

The cooperation of a large national retailer in the USA provided the opportunity to test a healthy work organization intervention process. This publicly held corporation operates approximately 2,000 large warehouse-type stores, mostly in the USA; it employs approximately 300,000 people and has net sales in excess of 70 billion dollars per year. Four goals were established for this study: (1) to conduct a longitudinal assessment of intervention effectiveness with a follow-up period of at least 1 year; (2) to compare treatment and control work sites using both employee health and well-being and business performance outcomes; (3) to use the work site as the unit of analysis; and (4) to deploy an intervention process derived from relevant organizational and behavioural theory that could be sustainable and potentially generalizable to other organizations.

Healthy work organization intervention process

Stokols (1992) uses the term 'health promotive capacity' to describe the potential of an environment for promoting and maintaining improved levels of health over time. Extrapolating this to organizations, DeJoy and Wilson (2003) proposed an intervention process intended to help organizations expand their capacity to create healthier work organizations. This focus on capacity building, widely applied in community settings (Crisp, Swerissen, & Duckett, 2000; Goodman *et al.*, 1998) can also be applied to work organizations. At its core, the process of creating healthier work organizations *is* about capacity building, or expanding the organization's ability to identify, mobilize, and address important and relevant problems.

Figure 1 expands the process proposed by DeJoy and Wilson (2003). This process draws from total quality management (e.g. Waldman, 1994), organizational learning (e.g. Senge, 1990), and high involvement work processes (e.g. Lawler, 1992). All three approaches emphasize information exchange, problem solving, and employee involvement as central to organizational change. A participatory, problem-solving process, in which diagnostic data are assessed and used to identify problems, set goals, and evaluate progress, is at the centre of Figure 1. The research literature on participation and worker involvement shows a wide range of effects in the fields of management, organizational behaviour, industrial psychology, and communications (e.g. Cotton *et al.*, 1988; Lawler, 1986, 1992; Miller & Monge, 1986). Participation can enhance employees' sense of understanding, control (self-efficacy), and communication. Participation almost automatically increases communication, but it can also increase perceptions of control over events, the upward sharing of information, and knowledge about the organizational context and the individual's role in the organization. Participation can also increase opportunities for both informational and emotional social support (Marks, Mirvis, Hackett, & Grady, 1986). From an organizational design – organizational development perspective, broad-based participation is important to continuous improvement and organizational learning (*cf.* Senge, 1990).

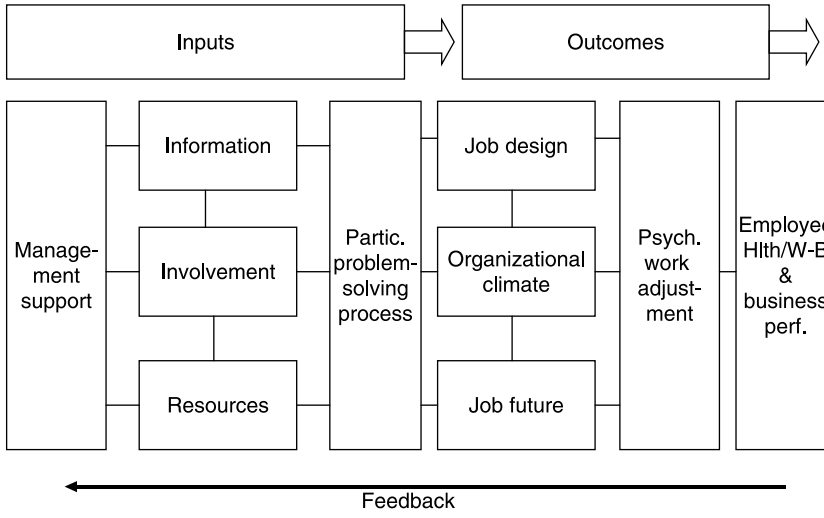

Figure 1. Model of the healthy work organization intervention process.

However, a successful process begins with the will to implement it, and accordingly, Figure 1 highlights the critical importance of leadership or management support in underwriting the capacity-building process by sharing relevant information with employees, providing opportunities for meaningful participation, and allocating necessary resources for making structural and operational changes. Information, involvement, and resources are the basic inputs into the problem-solving process. Also, as seen in Figure 1, actions to improve work organization typically involve changes to one or more of three broad work domains: job design, organizational climate, or job future. Job design includes the demands and characteristics of individual jobs. Organizational climate emphasizes communication, participation, and the general social environment at work. Job future addresses job security, equity, and other career development issues. Acknowledging the importance of subjective evaluation and individual meaning in understanding the effects of various job and organizational factors (e.g. Lindstrom, 1994), improvements in work organization should eventually translate into improvement in job satisfaction and other elements of psychological work adjustment. Organizational effectiveness outcomes are the principal long-term (distal) outcomes of the intervention process, but an expanded view of organizational effectiveness is assumed, one that includes both employee health and well-being and business performance (e.g. Danna & Griffin, 1999; DeJoy & Wilson, 2003; Jaffe, 1995). This conceptualization of outcomes follows from previous research on participatory strategies, team-based work, and job redesign (Beal, Cohen, Burke, & McLendon, 2003; Black & Gregersen, 1997; Morgeson *et al.*, 2006).

Three hypotheses guided the current study:

Hypothesis 1: Relative to control worksites, worksites engaging in the intervention process will show positive changes in targeted aspects of job design, organizational climate, or job future (these are referred to as proximal outcomes). Moreover, the participatory nature of the intervention suggests that aspects of organizational climate, such as employee involvement and communication, should be particularly sensitive to the intervention process.

Hypothesis 2: Relative to control worksites, worksites engaging in the intervention process will show improvements in psychological work adjustment as reflected in measures of job

satisfaction, organizational commitment, and related indices (these are referred to as intermediate outcomes).

Hypothesis 3: Relative to control worksites, worksites engaging in the intervention process should show improvements in employee health and well-being and financial performance (these are referred to as distal outcomes).

Research design and methods

Study design

A total of 21 stores (four operational districts within the Southern US region) agreed to participate in the study. Two districts (11 stores) were assigned to the intervention group and two districts (10 stores) served as control sites. The stores within this company tend to be very similar in basic operations, physical layout, and overall product mix, and range in size from about 150 to over 300 employees.

Assignment to intervention and control conditions was conducted to make worksites in the two conditions as comparable as possible in location, demographics, employee characteristics, and sales volume. Baseline surveys (organizational audits) were conducted at all 21 worksites 6 months prior to the start of the intervention. This same survey with minor modifications was then readministered approximately 12 months later (post-test 1), and again 24 months later (post-test 2). Summary results from the baseline survey were given to the employee problem-solving team at each intervention store. Store-level financial and human resources data for each store were collected from the company on a monthly basis throughout the study. This information was also summarized and made available to the intervention teams.

Participants

In each store, completion of the surveys was entirely voluntary and anonymous. The final sample consisted of 2,207 employees at pre-test; 1,723 at post-test 1; and 1,510 at post-test 2, representing 53, 44, and 35%, respectively, of employees at each time frame. Participation rates in the intervention and control sites were similar (56, 43, and 36% for intervention sites; 49, 45, and 35 for control sites).

Research team members coordinated on-site distribution and collection of surveys during all phases of the study. Surveys were distributed during two consecutive weekdays at each location and, to the extent possible, data were collected on the same days of the week. Completed questionnaires were deposited into locked storage boxes to reinforce confidentiality. Employees were given time on the clock to complete surveys and participate in intervention activities. In accordance with company policy, completed surveys contained no identifying information that would allow tracking of individual responses across time. Company policy also prohibited the use of participant incentives.

Intervention: Data-driven problem-solving teams

The intervention was designed to build capacity for employee participation and problem solving and create a healthier work organization. An employee problem-solving team, called the 'ACTion team', was organized within each intervention store. ACTion team members (8–12 per team) came from all departments and levels and were broadly

representative of the employee mix at each location. The teams were charged with developing, implementing, and evaluating tailored plans of action for addressing the issues or problems identified within their stores. Assisted by trained facilitators, the ACTion teams developed action plans using a five phase problem-solving process: familiarization, skill building, prioritization, action, and reaction. An intervention manual provided guidance and resource materials for the teams as they worked through the successive stages of the intervention process.

In the familiarization phase, the roles and responsibilities of the team were explained and discussed. In addition, the timeline for the project was presented, and the entire intervention process was described. In the skill-building phase, certain roles were determined (e.g. team captain, recorder, project liaison), ground rules for the team were established, and a regular weekly meeting time was set. A variety of structured activities were used by the facilitators, directed at improving team communication and cohesiveness (e.g. team mapping, mirroring), as well as developing problem solving (e.g. weighing pros and cons), time management (e.g. prioritizing tasks), and conflict resolution skills (e.g. anger control).

The baseline survey results provided the starting-point for problem identification and action planning. The facilitator helped the team move through a systematic set of activities to identify priority problems and issues. During the action phase, the ACTion team developed a detailed action plan to meet team goals and address the identified priorities. Action plans were shared and discussed at regularly scheduled store-wide meetings (which all employees were required to attend) and posted in the employee break room. Finally, in the reaction phase, the team reviewed its action plan, monitored progress, and communicated with each other and the rest of the employees about the steps being taken to refine and adjust the overall plan.

As the teams became established, the level of facilitation was gradually reduced to help the teams become more independent and self-sustaining. Although all intervention stores used the same five-stage intervention process and intervention manual, the specific activities and initiatives undertaken varied from site to site based on identified needs and specific action strategies adopted by the teams. In control stores, teams were not formed and no organized activities or consultations were provided.

Measures

Intervention effectiveness was assessed using three levels of outcomes. The proximal outcomes included three set of measures assessing job design, organizational climate, and job future, respectively (see Figure 1). The intermediate outcomes included five measures of psychological work adjustment, and the distal outcomes consisted of two sets of measures assessing employee health and well-being, and store business performance, respectively. All measures, with the exception of business performance, were collected as part of the employee surveys. Table 1 provides summary information for the measures included on the instrument.

Job design

The seven job design dimensions were derived largely from the job stress literature (Cooper & Cartwright, 1994; Lindstrom, 1994; Sauter, Murphy, & Hurrell, 1990) and included: workload, control/autonomy, job content, role clarity, environmental conditions, physical work demands, and work scheduling.

Table 1. Summary information for the outcome measures included on the organizational audit

Measure	Source	No. of items	Reliability	Sample item
Job design				
Workload	Klitzman, House, Israel, and Mero (1990)	4	.78	'I am asked to do an excessive amount of work'
Control/autonomy	Hackman and Oldham (1975)	3	.77	'My job permits me to decide on my own how to go about doing the work'
Job content	House, McMichael, Wells, Kaplan, and Landerman (1979)	6	.80	'I have an opportunity to develop my own special skills and abilities'
Role clarity	Rizzo, House, and Lirtzman (1970)	4	.82	'There are clear, planned goals and objectives for my job'
Environmental conditions	Johansson, Johnson, and Hall (1991)	7	.84	'How often do each of these situations or conditions occur in your current job (high levels of noise, etc.)?'
Physical work demands	Johansson *et al.* (1991)	5	.82	'How often do each of these situations or conditions occur in your current job (heavy lifting, etc.)?'
Work scheduling	Morrow, McElroy, and Elliot (1994)	5	.84	'My work hours are unpredictable from one week to the next'
Organizational climate				
Organizational support	Eisenberger, Huntington, Hutchison, and Sowa (1986)	9	.91	'The organization really cares about my well-being'
Coworker support	Ribisl and Reischi (1993)	7	.92	'My coworkers care about me as a person'
Participation w/supervisors	Vroom (1959)	3	.77	'Do you feel you can influence decisions of your immediate supervisor regarding things about which you are concerned?'
Participation with others	Caplan, Cobb, French, Harrison, and Pinneau (1975)	3	.88	I take part with others at my workplace in making decisions that affect me'
Involvement work practices	Jamieson and O'Marra (1991)	10	.93	'To what extent does your company or organization have specific policies and/or programs in place for incorporating changes/innovations suggested by employees or employee groups?'
Communication	Vandenberg *et al.* (1999)	8	.86	'Management gives enough notice to employees before making changes in policies and procedures'

Table 1. (*Continued*)

Measure	Source	No. of items	Reliability	Sample item
Safety and health climate	DeJoy, Murphy, and Gershon (1995)	7	.90	'There are no significant shortcuts taken when work-place safety and health are at stake'
Job future				
Job security	Kuhnert Sims, and Lahey (1989)	5	.79	'I am afraid of losing my job'
Procedural equity	Greenberg (1986)	6	.95	'When pay and promotion decisions are made, all sides affected by the decisions have a say'
Distributive equity	Bavendam, Boyer, and Sorensen (1986)	4	.95	'I am fairly rewarded considering my responsibilities'
Learning opportunities	Vandenberg *et al.* (1999)	5	.90	'I am given a real opportunity to improve my knowledge and skills'
Flexible work arrangements	Bohen and Viveros-Long (1981)	6	.87	'How easy or difficult is it to arrange time to do each of the following (e.g. attend a doctor's appointment) on a typical workday?'
Psychological work adjustment				
Job satisfaction	Hackman and Oldham (1975)	5	.81	'Generally speaking, I am very satisfied with my job'
Organizational commitment	Mowday, Steers, and Porter (1979)	9	.92	'I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful'
Job stress	Cohen, Kamarck, and Mermelstein (1983)	6	.88	'In the last month, how often have you been upset because of something that happened unexpectedly at work?'
Work self-efficacy	Spreitzer (1995)	3	.81	'I am confident in my ability to do my job'
Work impact	Spreitzer (1995)	3	.88	'My impact on what happens in my work-group is large'
Employee health and well-being				
Perceived Health	Ware and Sherbourne (1992)	1	–	'In general, would you say your health is (Excellent–Poor)?'
Perceived safety at work	Original to Study	1	–	'All in all, how would you rate your work situation in terms of your personal exposure to safety and health hazards?'
Alcohol use	CDC (1998)	2	–	'How many days per month do you drink and what is the typical number of drinks consumed on those days?'

Table 1. (*Continued*)

Measure	Source	No. of items	Reliability	Sample item
High risk health behaviours	CDC (1998)	4	.71	'Have you ever been told by a doctor or health professional that your cholesterol is high?'
Preventive health behaviours	CDC (1998)	5–7	.94/.95	'How long has it been since you had your blood pressure taken by a doctor or other health professional?'

Note. The number of items comprising the preventive health behaviours measure and the specific items included were different for males and females. The first reliability is for females and the second for males.

Organizational climate

The organizational climate domain emphasized the perceptions employees form about their overall work environment, particularly the climate for support, communication and involvement. Seven dimensions were included in this component: organizational support, co-worker support, participation with supervisors, participation with others, involvement work practices, communication, and safety and health climate.

Job future

Reflecting ongoing trends and changes in the basic employer–employee relationship (i.e. Rousseau, 1997), this domain included five scales: job security, procedural equity, distributive equity, learning opportunities, and flexible work arrangements.

Psychological work adjustment

Five measures were included here: job satisfaction, organizational commitment, job stress, work self-efficacy, and work impact.

Employee health and well-being

This component included five measures: perceived overall health, perceived safety at work, alcohol use, engagement in health risk behaviours, and participation in preventive health behaviours. The alcohol use, health risk, and preventive behaviour measures were adopted from the US Centers for Disease Control and Prevention's Behavioral Risk Surveillance System (Centers for Disease Control and Prevention [CDC], 1998). There was no separate measure of tobacco use because it was included in the risk behaviour index. Overall, health and perceived safety at work were single item measures.

Business performance

Business performance data for each store came directly from the company each month throughout the project. Four measures were tracked and supplied to the teams: employee turnover, comparable sales, sales per labour hour, and average ticket. The last three of these measures are widely used metrics in the retail sector of the American economy. These measures are described in Table 2.

Table 2. Descriptions of the store-level business performance measures

Measure	Definition	Calculation
Employee turnover	Fraction of employees leaving at the end of a given month	Number of employees quitting the organization by the end of the month divided by the number of employees at the start of the month
Comparable sales	Percentage increase or decrease in sales at the end of the month relative to the same month in the previous year	Sales for the month subtracted from the sales of the same month in the previous year, and divided by sales of the same month in the previous year
Sales per labour hour	Dollar amount representing the average sales in a given month for each labour hour expended in that month	Sales for the month divided by the total number of labour hours used during that month
Average ticket	Dollar amount representing the average receipt in a given month for the store	Dollar value of total cash register receipts for the month divided by the number of receipts

Analytic procedures

Preliminary analyses

Preliminary analyses were conducted to determine whether the intervention and control store samples differed according to age, race, gender, job tenure, and education. For race and gender, Mann–Whitney tests of differences were conducted for each of the three periods. For age, job tenure, and education, analyses of variance were conducted for each time period.

Tests for intervention effectiveness

Given the nested structure of the data, intervention effectiveness was examined with multi-level random coefficients modelling (Hox, 2002; Raudenbush & Bryk, 2001) using the HLM 6.02 statistical package (Raudenbush, Bryk, Cheong, & Congdon, 2004). The general goal of the analyses was to test the statistical significance of the treatment (control vs. intervention) by Time (Times 1, 2, and 3 assessments) interaction across each of the outcome variables. Additionally, given that Time 1 was the pre-intervention period, the analyses also needed to examine whether there were differences between the control and intervention units in their initial status on the variables, and control for those differences if present. With respect to the analyses of the self-report variables, codes representing the SPI initiative and store profits were entered as control variables in all analyses. The SPI initiative was a customer service initiative introduced by new corporate management midway through our project. Controlling for profitability is a common practice in the organizational sciences when analyzing variables representing employee perceptions of various workplace attributes that have been aggregated to the higher unit level (e.g. Vandenberg, Richardson, & Eastman, 1999).

The analyses across all criterion variables were conducted in an identical fashion. As with all random coefficients analyses, both a Level 1 model (individual level) and a Level 2 model (between-unit level) are specified and simultaneously estimated. With

respect to the Level 1 model, only one predictor, Time, was incorporated. Time was a dummy coded variable whereby individual responses from Time 1 were assigned a code of 0, and individuals at Times 2 and 3 were assigned codes of 1 and 2, respectively. Using 0 to represent Time 1 responses meant that those responses were the initial status or baseline values. The Level 1 analyses represent the control of individual level responses as it generates the 21 random intercepts and regression coefficients. The random intercepts represented the means on the dependent variables for the units when the Time variable was at 0 (the initial status). The random regression coefficients were 21 vectors representing the across time differences (repeated measures) on each of the criterion variables. Both sets of random variables were utilized in the Level 2 model as dependent variables. Treatment (0, control; 1, intervention units) was entered as a predictor variable of the 21 intercepts and regression coefficients, and per the discussion above, unit profitability and whether a unit was part of the SPI programme were entered as control variables. Assigning a zero to the control units meant that they were the baseline condition. Examining the impact of treatment on the intercepts addressed whether there were statistically significant differences between control and intervention units on the initial status (Time 1 assessment) of each criterion variable. Due to space constraints, we will mention here that none of the effects of treatment on the intercepts were statistically significant. Thus, intervention and control units were statistically equivalent at Time 1 – pre-intervention.

Of greatest interpretive use for present purposes was the effect of treatment on the 21 regression coefficients. These are referred to as treatment-by-change interactions. Specifically, a statistically significant effect meant that the coefficients (representing vectors of change in the dependent variables across time) of the intervention units differed from the coefficients of the control units. That is, this test examined whether the rate of change in a dependent variable was a function of belonging to either the control or intervention conditions. Given that there were only two conditions, one may assume the group with the steeper rate of change differed from the other group in the presence of a statistically significant finding. If there had been more than one group, than tests of simple slopes (i.e. the vectors of change across time) would have been required to search out which coefficient from which group was contributing the most to the statistical significance. Interpretations of whether a significant interaction represented a difference in effectiveness between intervention and control units were based on the plot of the interactions.

For the financial measures, we used data from the third month after each time of survey data collection. Repeated measures analyses of variance were applied to the store-level business performance measures. Two by three repeated measures of analyses of variance were computed with the first factor representing the three measurement periods, and the two-level factor representing codes for intervention and control stores. Profitability was not used as a control variable for the objective financial measures.

Process evaluation

Evaluation of the intervention process consisted of (1) detailed notes kept by the intervention facilitators throughout the process, (2) surveys of the intervention team members conducted at the end of the facilitated portion of the intervention, and (3) interviews of randomly selected team members and employees 3 months after the intervention. Intervention facilitators completed a detailed summary of each session immediately following the conducted session. In addition, the facilitators met as a group

with the project coordinator on a weekly basis to discuss the intervention implementation and revise their notes as needed. Interviews were conducted with store management (two) and randomly selected employees (from two to five) at nine of the treatment stores. A focus group was also conducted with the ACTion team to obtain feedback specifically on the intervention process. Interviews were conducted, taped, transcribed, and summarized by project staff trained in interview techniques and qualitative analysis, but who had not been associated with the intervention. The constant comparative method of analysis was used to examine data and develop themes. The constant comparative method is an analytic technique used to systematically extract and refine categories and themes from interviews and other sources of qualitative data (Charmaz, 2006).

Results

Comparability of treatment and control samples

The intervention and control samples were quite similar in terms of demographic characteristics (see Table 3). There were no statistically significant sample differences between the two groups for age, race, gender, or job tenure at any of the three time intervals. Significant differences were found for educational level at each time period. The educational level among employees was lower in the treatment than in the control stores. However, the R^2 values indicated that in two out of three instances, less than 1% of the variance in education was being accounted for in the tests of differences

Table 3. Demographic characteristics of employee samples at intervention and control stores

	Intervention stores (%)			Control stores (%)		
Demographic characteristics	Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2
Age						
≤39	60	54	56	59	56	57
≧ 40	40	46	44	41	44	43
Gender						
Male	65	66	70	64	65	70
Female	35	34	30	36	35	30
Race						
White	80	76	74	80	81	83
African-American	6	6	8	10	7	8
Hispanic	7	7	8	4	5	5
Other	7	11	10	6	7	4
Job tenure						
≤ 2 years	72	61	66	64	59	61
2–5 years	20	30	23	26	30	30
≧ 5 years	8	9	10	10	10	9
Education						
High school or less	34	31	29	25	24	22
Some college/tech	55	56	59	59	60	61
College graduate	11	13	12	16	16	17

Note. Percentages may not equal 100% due to rounding.

between individuals in the intervention and control groups. Given the need to conserve degrees of freedom, we concluded that there was little to be achieved by controlling for any of the demographic variables in conducting the assessments of intervention effectiveness. The study samples were generally similar to the overall employee population of the company. Data provided by the company at the beginning of the project showed an average age of 34 for the total workforce. Approximately, 35% of all employees were female, 77% were White, and 11% African-American.

Baseline results

Table 4 presents group means for the three categories of proximal measures: job design, organizational climate, and job future. Table 5 contains similar data for the intermediate and distal outcomes.

Table 4. Group means for the proximal outcomes

	Intervention stores			Control stores		
Measure	Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2
Job design						
Workload	2.99	2.93	2.86	2.75	2.87	2.99
Control/autonomy	3.61	3.50	3.40	3.61	3.46	3.31
Job content	4.08	4.00	3.93	4.08	3.93	3.77
Role clarity	3.95	3.93	3.92	3.92	3.86	3.80
Environmental conditions	2.13	2.24	2.34	2.23	2.43	2.62
Physical work demands	3.45	3.52	3.58	3.56	3.62	3.69
Work scheduling	3.12	3.18	3.24	3.16	3.13	3.10
Organizational climate						
Organizational support	3.52	3.46	3.40	3.53	3.39	3.25
Co-worker support	3.39	3.38	3.36	3.38	3.33	3.27
Participation – supervisors	3.32	3.26	3.20	3.32	3.24	3.15
Participation – others	3.23	3.11	2.99	3.31	3.12	2.93
Involvement work practices	3.68	3.64	3.59	3.76	3.63	3.49
Communication	3.44	3.39	3.33	3.48	3.38	3.28
Safety and health climate	4.09	4.09	4.08	4.16	4.12	4.08
Job future						
Job security	3.78	3.59	3.39	3.73	3.53	3.32
Procedural equity	3.25	3.12	3.00	3.24	3.03	2.83
Distributive equity	3.23	3.10	2.96	3.22	3.02	2.83
Learning opportunities	3.72	3.66	3.60	3.77	3.60	3.42
Flexible work arrangements	3.11	3.05	2.99	3.06	2.96	2.87

Note. Adjusted Bayesian Means. Higher values represent more positive responses, except for physical demands and environmental demands.

At baseline, most employees were quite satisfied with their work situations, and the profile of responses across the three work domains (i.e. job design, organizational climate, and job future) was consistent with our initial observations and preliminary interactions with both management and employees. Looking at the individual job design dimensions, employees gave the most positive ratings to role clarity and job content. The least positive scores were for physical demands and scheduling, which is not surprising. Many jobs in the stores involve standing for long periods and/or frequent

Table 5. Group means for the intermediate and distal outcomes

	Intervention stores			Control stores		
Measure	Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2
Work adjustment						
Job satisfaction	3.69	3.57	3.45	3.68	3.50	3.32
Organization commitment	3.84	3.64	3.44	3.85	3.57	3.29
Job stress	2.56	2.56	2.55	2.61	2.66	2.71
Work self-efficacy	4.31	4.26	4.22	4.34	4.29	4.24
Work impact	3.54	3.45	3.36	3.63	3.47	3.31
Employee health and well-being						
Perceived health	3.65	3.66	3.67	3.67	3.62	3.57
Perceived safety at work	3.99	4.02	4.05	4.08	4.04	4.01
Alcohol use	19.30	18.25	17.21	18.39	18.16	17.92
High risk health behaviours	0.29	0.30	0.30	0.30	0.29	0.29
Preventive health behaviours	3.10	3.10	3.11	3.03	3.09	3.15
Business outcomes						
Employee turnover	0.11	0.13	0.12	0.10	0.09	0.14
Comparable sales	0.10	−0.01	−0.03	0.06	0.03	−0.02
Sales/labour hour	134.51	151.82	160.95	138.01	155.21	154.83
Average ticket	51.02	50.72	51.14	47.22	46.47	47.76

Note. Adjusted Bayesian Means. Higher values represent more positive responses, except for job stress, alcohol use, high risk health behaviours, preventive health behaviours, and employee turnover.

lifting and handling of materials (stocking, etc.). All of the stores are open 7 days per week from about 7 a.m. to 10 p.m.; the busiest times are typically weekends and holidays, and most employees are scheduled to work at these times. For organizational climate, the most positive baseline ratings were given to safety and health climate, followed by involvement policies, and organizational support. For job future, the most positive baseline scores occurred for job security and learning opportunities, with lower scores given to the two equity measures and flexible work arrangements.

This particular company took considerable pride in having well-designed jobs, a positive safety and health climate, and highly regarded employee training and customer service programs. The company, having been in a sustained expansion mode for a number of years, also offered good job security and opportunities for advancement. Consistent with this assessment, the baseline scores for job satisfaction, organizational commitment, and work self-efficacy were also quite positive (means of 3.5, 3.8, and 4.3, respectively; see Table 5). Comparing one store to another, there was also a high degree of consistency in terms of the specific dimensions receiving the highest and lowest rated scores. In terms of priorities identified by the ACTion teams, communication, work schedule, and co-worker support were identified as key issues across multiple sites. Other issues identified less frequently included: participation, pay and promotion equity, safety, working conditions, management support, and employee recognition.

Intervention effectiveness: Proximal outcomes

As is apparent from Table 4, scores on almost all of the proximal outcomes declined across time within both treatment and control stores. This was largely the result of the changes that were taking place within the company (over which we had no control)

during the study, along with external events. Soon after study initiation, the company was jarred by a series of significant events, including an abrupt transition in top corporate leadership, severe competitive pressures, a recessionary American economy, and a series of unsettling world events, including the '9-11' terrorist attack on the World Trade Center and the war in Afghanistan.

Specific to the intervention process, we expected that the dimensions of organizational climate most closely related to employee involvement and capacity building would be most sensitive to the intervention process. In line with this prediction, significant treatment-by-change interactions favouring the treatment stores were obtained for involvement practices ($t[17] = 3.01$, $p < .008$, $\eta^2 = .03$), and organizational support ($t[17] = 2.86$, $p < .01$, $\eta^2 = .02$). Trends favouring the intervention group were evident for communication ($t[17] = 1.85$, $p < .06$, $\eta^2 = .04$) and participation with others ($t[17] = 1.63$, $p < .10$, $\eta^2 = .01$). The interactions for co-worker support, workplace safety and health, and participation with supervision were not statistically significant. Looking at the plots for involvement practices and organizational support presented in Figure 2a and 2b, respectively, the downward vector of change across time was considerably steeper in the control than intervention stores.

Of the seven work design variables, significant treatment-by-change interactions favouring the intervention stores were obtained for job content ($t[17] = 3.35$, $p < .001$, $\eta^2 = .02$), role clarity ($t[17] = 2.69$, $p < .008$, $\eta^2 = .02$), and environmental conditions ($t\ [17] = -2.28$, $p < .04$, $\eta^2 = .01$). Similar effects approaching significance were evident for autonomy ($t[17] = 1.66$, $p < .09$, $\eta^2 = .03$), and work scheduling

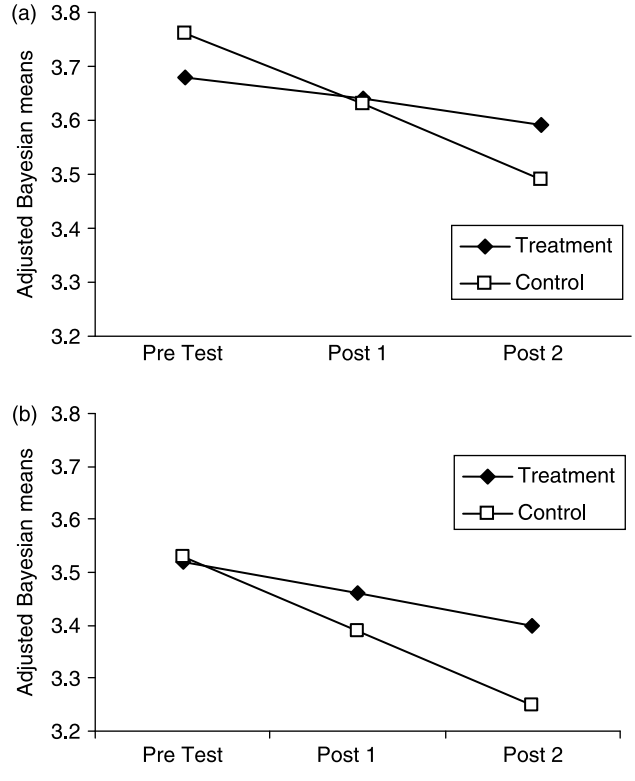

Figure 2. Plots of group means for (a) involvement practices and (b) perceived organizational support.

($t[17] = 1.82$, $p < .08$, $\eta^2 = .01$). Plots for the three significant interactions are presented in Figure 3a–3c. Role clarity remained relatively stable for the intervention stores while it declined steadily over time for the control stores. The vectors of change for job content were generally declining for both groups, but the decline was much more pronounced in the control stores. Environmental demands increased (an undesirable outcome) in both conditions, but once again, the increase in environmental demands was steeper in the control sites. Although the effect for work scheduling did not reach statistical significance, scheduling was a priority issue for many of the store teams. Referring to the means in Table 4, it is worth noting that the intervention stores actually improved somewhat across time periods on this measure, while the control

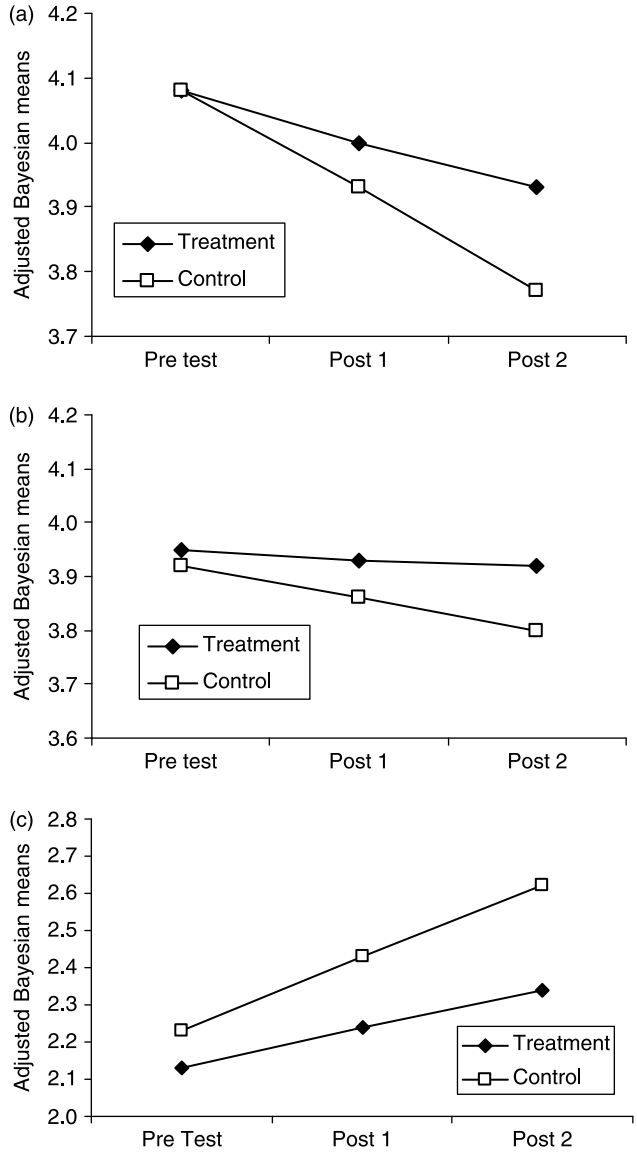

Figure 3. Plots of group means for (a) job content, (b) role clarity, and (c) environmental conditions.

sites declined. By the end of the study, employees in the intervention stores perceived greater work schedule flexibility than they did at study start.

Turning to job future, the treatment-by-change interactions for learning opportunities ($t[17] = 2.78$, $p < .01$, $\eta^2 = .02$) and procedural equity ($t[17] = 2.28$, $p < .04$, $\eta^2 = .03$) were significant while the interaction for distributive equity ($t[17] = 1.73$, $p < .08$, $\eta^2 = .02$) approached significance. The interactions were not statistically significant for job security or flexible work arrangements. Referring to Figure 4a and 4b, learning opportunities were a relative strength at baseline, and although this dimension changed negatively across time for both treatment and control conditions, the change was substantially less severe in the intervention condition. The interaction effect for procedural equity shows negative change across time in both conditions, but the change was steeper for control than for intervention sites. The pattern for distributive equity was similar but statistically not significant.

In summary, the results for the three sets of proximal outcomes provide partial support for Hypothesis 1 and suggest that the intervention did have beneficial effects in at least two respects. First, several of the work dimensions targeted for improvement at baseline did improve in the treatment stores relative to the control stores. Second, the intervention stores were more able to retain their strengths during turbulent times. Indeed, the extent of negative change in many of the job-domain dimensions was less precipitous in the sites receiving the intervention.

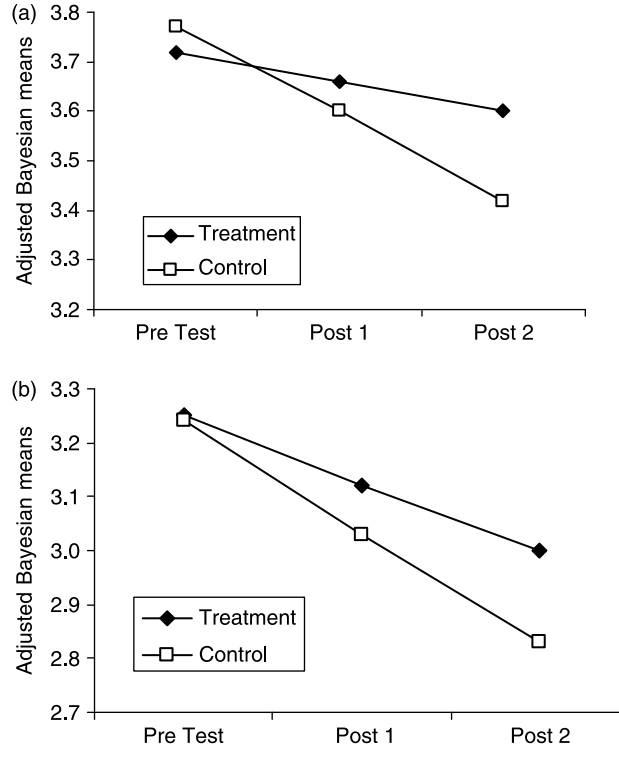

Figure 4. Plots of group means for (a) learning opportunities and (b) procedural equity.

Intervention effectiveness: Intermediate outcomes

Hypothesis 2 predicted that the intervention process would produce positive change on psychological work adjustment. Among the five variables in this group, the treatment-by-change interactions for job satisfaction ($t[17] = 2.19$, $p < .03$, $\eta^2 = .03$), organizational commitment ($t[17] = 3.58$, $p < .003$, $\eta^2 = .02$), and job stress ($t[17] = -1.83$, $p < .05$, $\eta^2 = .02$) were each statistically significant (see Table 5). The negative change across time for job satisfaction and organizational commitment was greater (see Figure 5a and 5c) for control than for intervention stores. Regardless of the differences

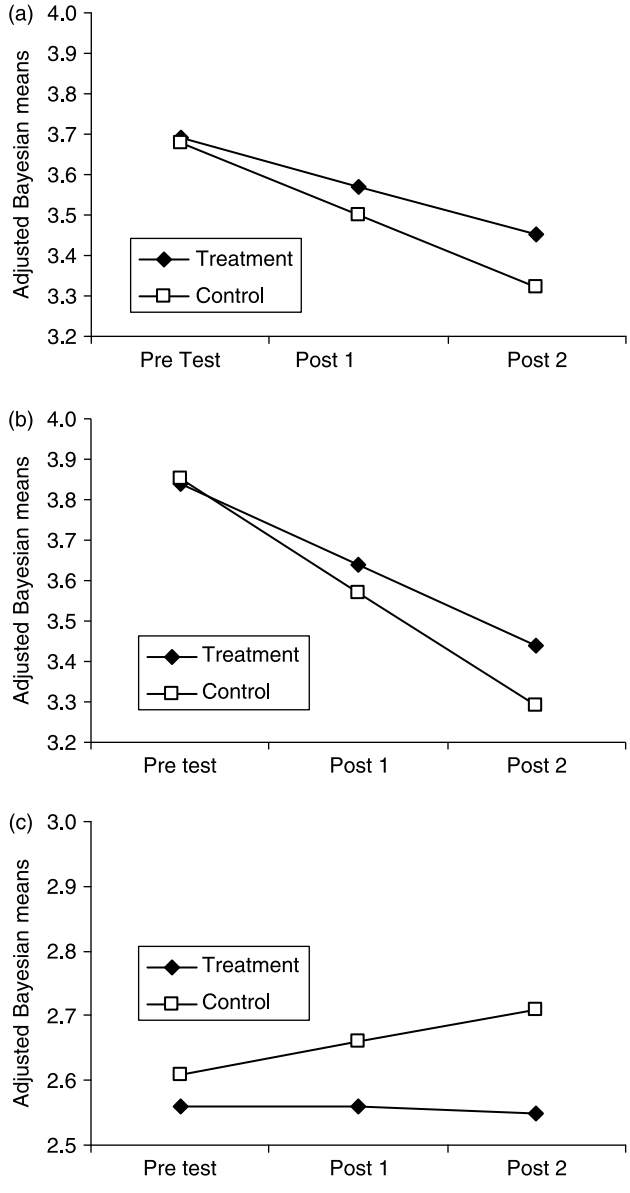

Figure 5. Plots of group means for (a) job satisfaction, (b) organizational commitment, and (c) job stress.

in the vectors of change between conditions, one cannot ignore the general observation that employees in stores of both conditions were experiencing an overall decline in morale. In contrast, the results for job stress showed that the level of stress within the intervention stores remained relatively low and unchanging across time, whereas stress within the control stores increased steadily over the same time period. Non-significant effects were obtained for work self-efficacy and personal impact on the work-group. In sum, partial support was obtained for Hypothesis 2.

Intervention effectiveness: Distal outcomes

Among the five measures of employee health and well-being (Table 5), significant treatment-by-change interactions were obtained for overall perceived health ($t[17] = 2.07$, $p < .04$, $\eta^2 = .01$) and perceived safety at work ($t[17] = 2.43$, $p < .02$, $\eta^2 = .05$). In contrast to the intervention stores, which experienced slight positive change on both variables during the duration of this study (see Figure 6a and 6b), the vectors of change for the control stores were negative for both health and safety. The interactions for alcohol use, engaging in high risk health behaviours, and undertaking preventive health measures were not statistically significant.

The results for the financial measures are also presented in Table 5. Significant treatment-by-change interactions were obtained for both sales per labour hour ($F[2, 36] = 3.64$, $p < .04$, $\eta^2 = .03$) and employee turnover ($F[2, 36] = 4.10$, $p < .03$, $\eta^2 = .02$). In both instances, the outcomes favoured those stores receiving the

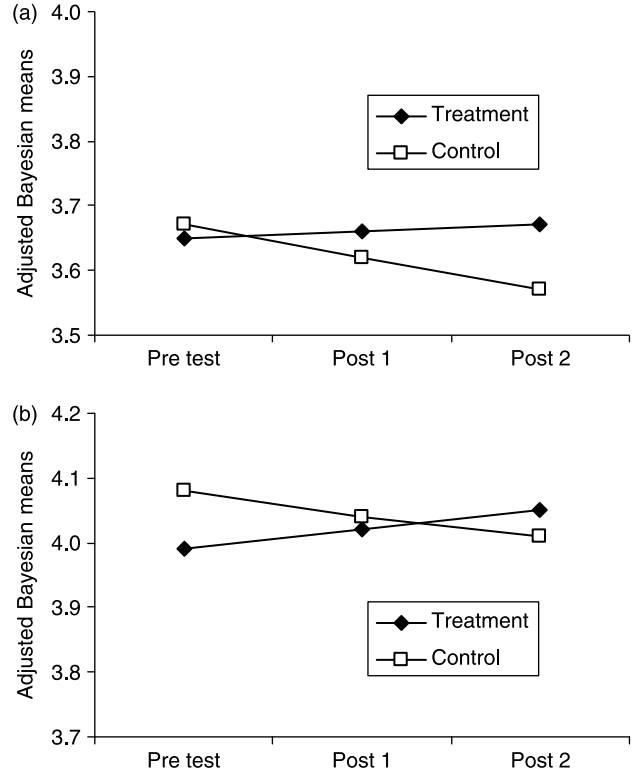

Figure 6. Plots of group means for (a) perceived health and (b) perceived safety at work.

intervention. Looking at the trends from Time 2 (which represents the survey administration closest to the intervention process) to Time 3, the intervention stores experienced a positive change in sales per labour hour (see Figure 7a) and a levelling of employee turnover (Figure 7b). In contrast, the vector of change for sales was slightly negative while turnover changed positively (increased) in the Control stores.

Thus, it seems reasonable to conclude that Hypothesis 3 also received partial support.

Process evaluation

Notes kept by the facilitators during the intervention process showed that the problems addressed by the teams generally coincided with the survey results specific to a worksite. Each site chose at least three different issues to work on and proposed three or four different strategies for dealing with the identified issues.

Action team members were surveyed at the end of the facilitated portion of the intervention process to assess their perceptions of the process and its overall success. Most team members rated the team-based intervention process positively in terms of participation and communication. When asked what the ACTion team 'had done a good job of doing', 92% of team members indicated their team has done a good job of identifying problem areas, 82% indicated good performance in setting priorities, and 76% thought their team had devised effective solutions. There was less satisfaction

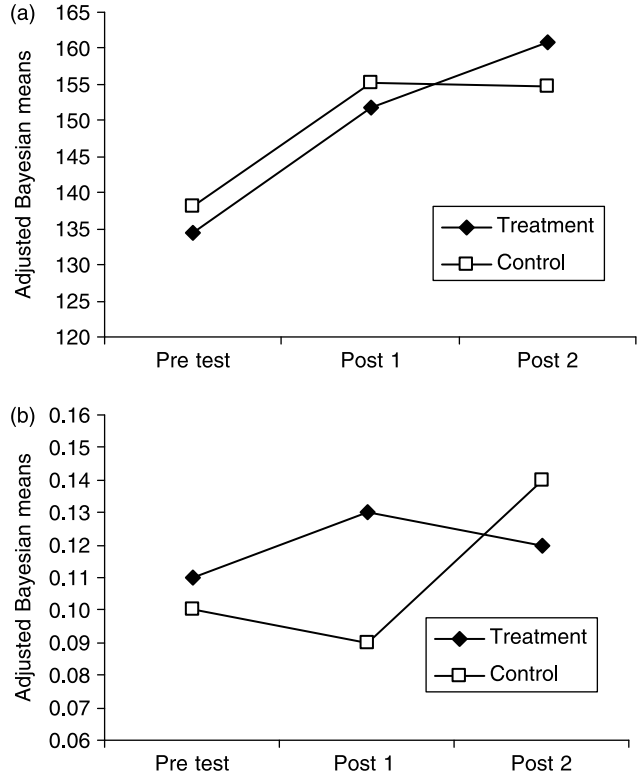

Figure 7. Plots of group means for (a) sales per labour hour and (b) employee turnover.

about being able to make actual changes in their store. Approximately, 50% of team members thought that the team had 'improved things at the store' or had 'made their store a better place to work'. When Team members were asked what they personally had gained by participating on the ACTion team, the most frequent responses were having a chance to express views (84%) and learning more about the company (68%).

Analysis of the interview and focus group data revealed several themes. First, the ACTion teams identified communication as a key issue and worked to improve communication with top management, but were not very successful in facilitating communication horizontally among fellow employees. Second, the team members felt that they had the skills, knowledge, and training necessary to impact the store. However, a lack of 'power' (i.e. sufficient time and flexible scheduling to meet and brainstorm about worksite issues and make decisions) inhibited their abilities to create a healthier worksite. Third, issues regarding trust were evident in views expressed about the surveys used in the project. Some employees felt coerced into completing them. Some focus group members indicated fear of retaliation and distrust in the store. Fourth, the focus groups emphasized the importance of recognition on an individual level. Teams expressed how they would have appreciated receiving some type of recognition for their efforts. Fifth, attrition of team members became a serious issue over time, with some teams losing the majority of their original members due to scheduling conflicts, job changes, turnover, and other factors. Sixth, management support was a real key to intervention success, with the critical support coming from the overall site-level (store managers rather than at the regional or corporate levels). Finally, staffing and scheduling issues became more problematic over time and served to limit the overall effectiveness of the ACTion teams.

Discussion

The primary purpose of this research was to evaluate the effectiveness of a participatory, problem-solving intervention designed to promote healthy work organization. Overall, the worksites receiving the intervention fared better than control worksites during the duration of the study, which included a period of corporate transition and difficult business conditions. Although most of the outcome measures declined across time in both the treatment and control conditions, the intervention process appeared to buffer some of the declines. Stores receiving the intervention were better able to preserve some of the strong aspects of their work organization during this turbulent period. Intervention-related effects were evident for several of the work dimensions targeted by the teams, as well as in some of the organizational climate dimensions considered to be focal points for this type of participatory intervention.

Job satisfaction and organizational commitment declined across time for treatment and control stores alike, but these declines were more pronounced in stores that did not receive the intervention. Stress levels within the intervention stores remained relatively low and stable across time, while those in the control sites increased noticeably. The intervention was less successful in influencing the two empowerment-related measures: work self-efficacy and impact. The lack of effects for these particular dimensions may reflect the difficulties some of the teams had in effectively implementing their action plans and producing change in their stores. Tangible results from the problem-solving process would be expected to boost perceptions of empowerment (Ashforth, 1989; Spreitzer, Kizilos, & Nason, 1997).

The results for the health and business outcomes were not as robust as anticipated. Still, employees at the intervention stores perceived themselves to be healthier and safer at work than those at the control sites. Intervention stores also returned stronger performance in terms of employee turnover and sales per labour hour. Sales per labour hour increased between the pre-test and the first post-test for all stores. Some of this increase was most likely attributable to cuts in staffing and reduced work hours for employees. The improvement in sales per labour hour was sustained in the treatment stores, whereas it levelled off and began to decline in control stores between the first and second follow-up periods.

Looking at the pattern of effects across time, most of the differentiation between control and treatment stores occurred between the first and second follow-up periods, that is, between 6 and 18 months after the beginning of the intervention. Parkes and Sparkes (1998), in their review of organizational stress interventions, recommended that studies should include more than a single post-test and have a follow-up duration of at least 2 years. We tried to follow these recommendations but found it difficult to sustain the attention of the stores for the 24 months that elapsed between baseline data collection and the second follow-up survey. Notwithstanding, the results from this study do suggest that such durations may be needed to realize the longer-term effects of work organization interventions.

The process evaluation indicated that the team process was effectively implemented and well-received, and that participants on the teams considered the experience to be useful and beneficial. The initial phases of the intervention process appeared to be effective in building capacity and behavioural capability. On the negative side, difficulties were encountered in sustaining and fully integrating the team process, as well as in executing the action plans. Some teams also because noticeably less active once active facilitation was withdrawn. To some extent, these difficulties were attributable to ongoing changes and challenges that were occurring within the company. As several informants commented, 'there were often just too many plays being called at the same time'. Questions have been raised about the overall 'intensity' of many organizational interventions, and the ability of such intervention to 'compete' and be sustained in the face of other organizational realities and priorities that demand the attention of managers and rank and file workers alike (e.g. Cox *et al.*, 2007). Maintaining sufficient intensity across many months is particularly difficult in the retail sector where business follows wide seasonal variations, employee turnover is high, competition is intense, and work scheduling is variable and often unpredictable.

Our model of the intervention process portrays management support as a key driving force for creating healthy work organizations. In short, management controls the agenda, sets the policies, provides the resources, and establishes accountabilities for results. The attention span of management, however, is often limited by the need to show results on a quarterly basis. From our experiences with this study, management support, *per se*, may not be enough to sustain the level of intensity needed for this type of intervention to succeed. While the teams were allowed to operate and supported to some degree, process results show that the ACTion teams were more a novelty than a real priority for store management. The participatory process used in this study was not directly linked to core business operations, it was non-specific in focus, and the company itself had not committed significant time or resources in bringing it about. Such direct connections may be pivotal to achieving sustainability and institutionalization. Besides, the intensity issue, another limiting factor was that each store was free to identify its own priority problems and to devise its own solutions. This basic approach

makes logical sense, in that, each store presents its own unique environment and socio-organizational context. But this clearly makes it more difficult to demonstrate intervention effectiveness in the conventional manner. Not all sites addressed the exact same problems, and even when the same issues were chosen, the identified solutions were not identical either in terms of potential efficacy or quality of follow-through. Creating teams fully representative of the store employees and limiting the direct involvement of management personnel may have also hampered the effectiveness of the teams. Employee readiness and willingness to participate have been mentioned frequently as limiting factors in the organizational development literature (e.g. Pasmore & Fagans, 1992).

The challenges associated with evaluating participatory interventions are not limited to workplace studies. These same issues have been noted with respect to healthy city initiatives (e.g. Kegler, Twiss, & Look, 2000). One approach used in these studies is to select outcomes that cut across multiple issues or topical areas and that are reflective of improved capacity. In the present study, the organization climate domain was expected to be most sensitive to the overall intervention process. Significant intervention effects were obtained for involvement practices and organizational support, but not for participation with supervisors or co-workers. Data collected during the process evaluation indicated that the teams were more successful in improving interactions with senior store management than with facilitating communication among fellow employees. This may partially explain the failure to find differences for these other organizational climate measures.

The results from the team member surveys show that participation was a positive experience from the participants' point of view and was perceived to be a useful professional development experience. The pattern of results for the various work organization dimensions suggest that there was some diffusion of beneficial effects beyond those directly involved in the team process. For example, employees in the intervention stores perceived the climate for involvement and communication more positively than did employees in the control stores. Similar results were evident for learning opportunities, pay and promotion equity, and job content. Trends in the data favouring the intervention stores could be detected in several of the other job design and organizational climate dimensions. Although these results may not be as strong as we would like, it does appear that the beneficial effects of the intervention were not confined to those who directly participated on the teams.

The response rates in this study were somewhat lower than expected and declined across data collection intervals for both intervention and control sites. Part of the decline was due to events occurring within the company and the economy and world at large. The baselines survey was administered during a stable period for the company, but the first and second follow-up surveys were administered in the midst of significant and largely unanticipated challenges for this company. All data collection had to occur on the less busy weekdays and we only had access for a 2-day period. As a result, we were not able to reach every employee in any given store. Some part-time employees only work weekends or evenings. Moreover, evenings tend to be busy times for the stores, and although we remained onsite into the evenings, it was sometimes difficult to get access to employees in certain parts of the stores. Still, our employee samples were generally representative of the overall employee profile for the company, and we were able to sample the majority of full-time employees in each of the stores.

The process evaluation revealed that some employees had misgivings about completing the surveys or felt coerced into completing them. These issues probably

contributed to the decline in response rates across time. Despite efforts to inform employees that this project was externally funded and that the research team retained custody of all data, there were a few employees who still believed that we were working for the company. The coercion issue is easier to explain. Some members of the ACTion teams were quite enthusiastic about the intervention process, and encouraged their fellow workers to complete surveys or otherwise help the team in achieving its goals. Most teams announced or publicized the surveys in some manner, and tried to get the best participation rates for their store. Any perceptions of mistrust most likely stemmed from the general decline in store morale during the study.

Conclusions

When taken together, the results of this study suggest that participatory, capacity-building interventions hold some promise for improving work organization as reflected in the three sets of outcomes examined in this research. The intervention did build skills and foster the motivation necessary to take action. The intervention teams were generally effective in utilizing the survey and business data in identifying problems and devising action plans for making improvements in their stores. The participatory, problem-solving process did impact job satisfaction, organizational commitment, and work stress. The teams also were successful in modifying some aspects of store operation and work processes. Problems occurred in sustaining the team-based process over the long-term and being able to fully translate actions plans into meaningful improvements. The teams suffered from attrition due to scheduling problems, work reassignments, and employee turnover. These problems increased from the middle to the end of the intervention period and, undoubtedly, had some adverse impact on action plan implementation and evaluation. Interference during the latter phases of a participatory process (i.e. implementation and evaluation) can be particularly problematic in realizing the long-terms effects (Black & Gregersen, 1997). Future users of this type of intervention should include additional training and programme features that focus on anticipating and overcoming obstacles in realizing agreed upon objectives. Bringing site management into the process earlier and more directly may also be beneficial. This could be accomplished by using short-term or proximal results to engender leadership buy-in and active engagement.

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