THE HEALTHY WORK ORGANIZATION MODEL: EXPANDING THE VIEW OF INDIVIDUAL HEALTH AND WELL BEING IN THE WORKPLACE

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ABSTRACT

With occupational stress representing just one example, different streams of research have emerged over the past several decades to explain the antecedents to and consequences of possessing a "healthy" workforce. A positive characteristic of these seemingly independent efforts is that a triangulation of results has emerged supporting the importance of attending to the health and well being of the individual worker. A drawback to these efforts, though, is that while utilizing at times the identical constructs, these constructs are configured differently depending on the conceptual premises of the focal framework. In an attempt to bring the different perspectives together, a model of the "healthy work organization" is presented and tested in this chapter. The model recognizes that there are higher-order

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constructs characterizing many of the component constructs of the previous efforts, and it is at this level that much of the unification of those efforts is achieved. Utilizing structural equation modeling procedures, the healthy work organization model was supported.

INTRODUCTION

While referred to variously by different names (e.g. work stress, job stress, workplace stress, etc.), occupational stress has been unquestionably a prominent characteristic over the past three decades for describing a "healthy work organization" (Hendrix, Summers, Leap & Steel, 1995). As such, occupational stress has been the primary focus during this time period of much theoretical and empirical research resulting in a proliferation of models and frameworks describing both its content and its process (Beehr, 1995). Reinforcing its prominence as a research theme is the simple fact that occupational stress is not just the purview of one discipline or area. Rather, it is a frequently addressed topic in the top journals of many disciplines including medicine (e.g. Hallquivist, Diderichsen, Theorell, Reuterwall & Ahlbom, 1998), public health (e.g. Mausner-Dorsch & Eaton, 2000), epidemiology (e.g. Muntaner, Anthony, Crum & Eaton, 1995), health services (e.g. Cahill & Landsbergis, 1996), health education (e.g. Heaney, 1991), industrial/organizational psychology (e.g. Edwards & Harrison, 1993), management and organizational behavior (e.g. Xie & Johns, 1995), and labor relations (e.g. O'Brien & Stevens, 1981). Further, whole edited volumes, such as the one in which this chapter finds itself and others (e.g. Beehr & Bhagat, 1985; Cooper, 1998; Sauter & Murphy, 1995), are frequently published to promote current research and thinking. Finally, perhaps the ultimate benchmark of its importance is the number of funding initiatives devoted to a deepened understanding of the healthy workplace, such as the National Occupational Research Agenda, which provided support for the research reported in the current chapter.

Why has understanding occupational stress risen to such importance? One major reason is the estimated costs associated with occupational stress – not only to the individual suffering from high levels of stress but also to organizations, the insurance industry, and to society. The annual cost of occupational stress to U.S. businesses, for example, is estimated to be a very conservative $100 billion annually (Landsbergis & Vivona-Vaughan, 1995). Depression, the major psychological symptom of stress, alone is estimated to cost $44 billion annually due to its deleterious effects on absenteeism, job performance, and other workplace behaviors (Greenberg, Kessler, Nells, Finkelstein & Berndt, 1996; Kessler, Barber, Birnbaum, Frank, Greenberg, Rose, Simon & Wang,

1999). Other factors stemming from occupational stress and adding tremendously to the costs include medical expenditures related to disease, safety violations, accidents, and suicide. For example, psychological indices like depression contribute to the prevalence of cardiovascular disease. As is well known, cardiovascular disease is the leading cause of death among the adult population, and the total medical cost of cardiovascular disease is estimated at around $329 billion in the United States (American Heart Association, 2001). What is less commonly understood in the general population is that a greater portion of the variance in cardiovascular disease is accounted for by psychological factors (i.e. stress) rather than physical ones (Koslowsky, 1998; Theorell & Karasek, 1996). Understanding why occupational stress has emerged in importance is quite obvious when these costs are considered. Namely, by making it a priority research issue, it is hoped that the resulting knowledge will provide the basis around which to design interventions targeted toward its control, and ideally, its eradication.

Toward this end, several theoretical frameworks of occupational stress have emerged over the past three decades. Arguably, the three most prevalent and influential conceptual viewpoints are person-environment fit theory (French, Caplan & Harrison, 1982), the framework of occupational stress (House, 1981), and the demand-control-support model (Karasek, 1979). These three frameworks have been and continue to be foundations for research on occupational stress as evidenced by the fact that most contemporary researchers reference one or more of the frameworks when generating their specific research questions (e.g. Eden, 2002; Spector & Goh, 2002). As with all foundations, unless they are built upon, they offer only a limited perspective on the phenomenon of interest. For reasons articulated later in this chapter, we argue that stakeholder interest (e.g. the individual worker, medicine and health, organizational decision makers, labor unions, Federal and State agencies, etc.) is not just in occupational stress per se. Rather, their interests could be more generally characterized as wanting to identify the *healthy work organization* in which not only is occupational stress considered, but also other factors, such as health promotion and safety and risk management. Further, stakeholder interest is in the *work organization* because it brings a human capital orientation to workplace health and recognizes that there are important linkages between preserving and enhancing human capital and maximizing business strategy (Becker, Huselid, Pickus & Spratt, 1997; Goetzel & Ozminkowski, 2000).

The intent of this chapter is to introduce a conceptual model of the healthy work organization, and to provide empirical evidence supporting its validity. As will be seen shortly, while occupational stress is an important tenet underlying the proposed model, it is not the only perspective represented. We argue

that this more general, healthy-work-organization perspective provides several needed extensions to the research in occupational stress:

- Despite *theoretical* claims for the existence of antecedents to the class of variables referred to as stressors in models of occupational stress (e.g. French et al., 1982), rarely are the antecedents included in actual empirical tests. The class of antecedents referred to here is the policies, beliefs and values transmitted by the *work organization* that support a "healthy" (i.e. less stressful) work environment. Thus, for reasons articulated in subsequent sections, the current test incorporates a set of antecedents referred to generally as organizational attributes.
- Even a cursory review of the empirical studies in occupational stress reveals that researchers operationalize "stressors" and "strains," and other model components using a host of variables. That is, there is no single operationalization of either a "stressor" or "strain" construct, or the other constructs within the occupational stress models. Stressors, for example, are commonly operationalized through measures of role conflict, job demands, autonomy, and a host of other variables in which the theme is on the requirements placed on workers through the job and its characteristics (e.g. Baker, Israel & Schurman, 1996). Strains are also variously operationalized through a multitude of constructs such as job satisfaction, organizational commitment, and anxiety (e.g. French et al., 1982; Spector & Goh, 2002). The point is that occupational stress researchers have adopted a multivariate perspective to operationalize the key components of their stress models with the assumption being that there is a common element underlying the component that ties the variables together. Yet, their actual empirical tests to date have not encompassed the assumption of there being a "higher-order" linkage among the variables characterizing a given model component. Rather, the tests of relationships have been primarily between one variable and another. A feature of the current healthy work organization model is that these higher-order components are isolated, and it is between them that the hypothesized relationships are examined.
- Another troublesome characteristic of the variables used to operationalize occupational stress model components is that they are identical to many of the same variables to operationalize components or linkages within many different conceptual frameworks of the organizational sciences. For example, Hackman and Oldham (1980) also propose linkages between job characteristics and outcomes like job satisfaction, and yet call this a "job characteristics model" and not an occupational stress model. Similarly, Hulin (1991) used many of the same variables as those in occupational stress models, and

relationships among the variables, to define a theoretical model of employee work adjustment. A final example is the fact that Vandenberg, Richardson, and Eastman (1999) also used many of the same variables to test a model of high involvement work processes. Our point is not to imply that one configuration of the variables is more appropriate than another configuration. Rather, it is to recognize the need to take an integrative perspective – one that uses knowledge from many of these perspectives to accurately specify a model that captures the key points of all of these perspectives. To do so acknowledges the fact that regardless of the label used by the various researchers, the overarching concern among all of them is the work organization, and particularly, the need to create an environment that is "healthy" for all stakeholders. The healthy work organization model presented in the current chapter is an initial attempt at such integration.

The chapter is organized into four primary sections. The section immediately following is a very brief review of the three main conceptual frameworks in the occupational stress literature. The review is primarily context setting. The second section is a detailed presentation of the healthy work organization model, and the rationale underlying its design. The third section is the presentation of the tests of the models using over 3000 employees from 21 locations of the same corporation. The final section is discussion and conclusions.

MODELS OF OCCUPATIONAL STRESS

Since the 1960s, numerous models of occupational stress have been postulated in order to catch the entire picture of the relationship between work environment and workers' strain (Sparks & Cooper, 1999; Tetrick & LaRocco, 1987). As mentioned previously, the P-E fit theory (French, Rodgers & Cobb, 1974), the framework of occupational stress (House, 1981), and the demand-control-support model (Karasek, 1979) have had the largest overall impact with respect to driving occupational stress research. Each framework is reviewed briefly in the forthcoming paragraphs.

The Person-Environment (P-E) Fit Theory

The core premise of P-E fit theory is that stress arises from a misfit between person and environment, not from the two components separately (French, Rodger & Cobb, 1974). When people perceive that their work environments are not good or do not fit well with the needs, wants, and desires that they personally would like fulfilled from work, the discrepancies yield diverse strains,

which are postulated to affect workers' health, well being, and work behaviors (Caplan, 1987; Caplan & Harrison, 1993; Edwards & Harrison, 1993). Figure 1 is a representative perspective within this stream of research.

Starting with "objective P-E fit" on the far left of Fig. 1, the assertion is that there is a "real" underlying fit between the objective environment of a position or job, and the objective attributes of the individual person holding that job. The objective environment places demands on the jobholder, which consist of quantitative and qualitative job requirements, role expectations, and group and organizational norms. Countering these demands are the individual's true abilities represented through the aptitudes, skills, training, time, and energy the person uses to meet the demands. Similarly, the objective environment also provides supplies consisting of the resources and rewards believed by the organization to meet adequate performance requirements in that position. The individual also has certain needs representing what is required to perform adequately, and encompassing physiological and psychological requirements of the job, values acquired through learning and socialization, and motives to achieve desired ends. The point is that the larger the discrepancy between the objective environment and the objective person, the greater the likelihood that a need for coping will arise (Edwards et al., 1998).

Whether that need for coping will eventually manifest itself in a person's behavioral and psychological responses at work (i.e. what is referred to as strains in Fig. 1) depends for the most part on the perceptual components of the model – the subjective environment and subjective person (Edwards & Harrison, 1993). Specifically, according to proponents of this perspective, stress is a subjective evaluation of whether perceived demands and supplies of the work environment are commensurate with the individual's perceptions of his/her own abilities and needs. If a large discrepancy is perceived, the individual may experience a great deal of strain, which simply defined are deviations from normal functioning in the individual's psychological, physical, and behavioral responses within the workplace (Edwards et al., 1998; Harrison, 1978). An important point of this perspective is just because a need for coping may exist based on "objective realities," it does not automatically mean that a person will experience stress and engage in defensive responding. Rather, whether strain is experienced at high levels depends on the subjective perceptions of the jobholder.

Over the years, a large quantity of research has been conducted on the P-E fit perspective. Representative is French et al.'s (1982) study using a using a random stratified sample of 318 workers in 23 occupations. The researchers operationalized both the subjective demands and supplies, and the subjective abilities and needs, and used 18 indices of psychological, physiological, and behavioral strains including job dissatisfaction, blood pressure, and smoking.

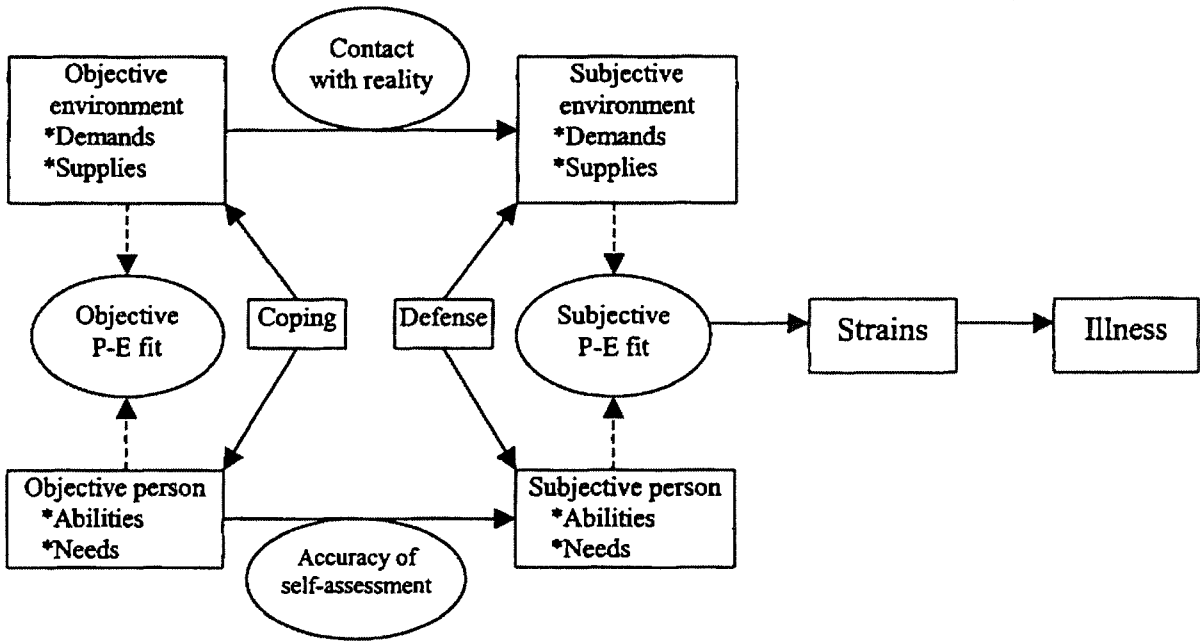

Fig. 1. A Model of Stress as Person-Environment Fit (Reprinted with permission from Edwards, Caplan & Harrison, 1998).

In general, they reported that subjective P-E fit was related most strongly to psychological strains, and to a lesser extent, physiological and behavioral strains. Depression was the most prominent psychological strain related to the P-E fit. Looking at the P-E fit literature collectively results in the following observations (Edwards, 1992). First, the relationships between P-E fit and various indices of strain have been well supported with the strongest associations occurring with psychological strain indices such as job dissatisfaction, anxiety, depressive symptoms, and somatic complaints. Second, because there are very few measures for objective P-E fit components (Harrison, 1985) and when used, there is little to no association with strains, most studies have only operationalized subjective P-E fit. Third, within the subjective P-E fit component, the majority of research has only operationalized the fit between perceived needs and supplies, and not between perceived demands and abilities.

The Framework of Occupational Stress

The framework of occupational stress (House, 1981) originated from the same theoretical foundation as that underlying the P-E fit perspective of occupational stress. That is, both models were based on French's (1963) programmatic social environment and mental health model. The framework of occupational stress shares two premises with P-E fit theory. One that stress arises from the misfit between person and environment, and the other is that subjective perceptions of work environments primarily determine strains. A major difference between House's framework of occupational stress and P-E fit theory is that House's entire framework together is occupational stress whereas P-E fit theory limits its focus on stress as arising only from the discrepancy between the subjective person and environment components. Figure 2 is a representative perspective within this stream of research.

The framework of occupational stress is based on a core definition, which is that occupational stress is a total process including the environmental sources of stress and the individual's perception of them as well as short-term and long-term physiological, psychological, and behavioral responses, and a number of modifying factors that influence the relationships among variables in the stress process (Israel, Schurman & House, 1989). Specifically, work stressors are the demands characterizing the individual's perceived role within the organization, and consist of such factors as role conflict, role ambiguity, underutilization, participation, and workload. Further, a combination of the work stressors determine individual perceived stress where perceived stress is cumulatively the individual's subjective negative feelings regarding the work environment such as job dissatisfaction. Perceived stress in turn shares a reciprocal relationship

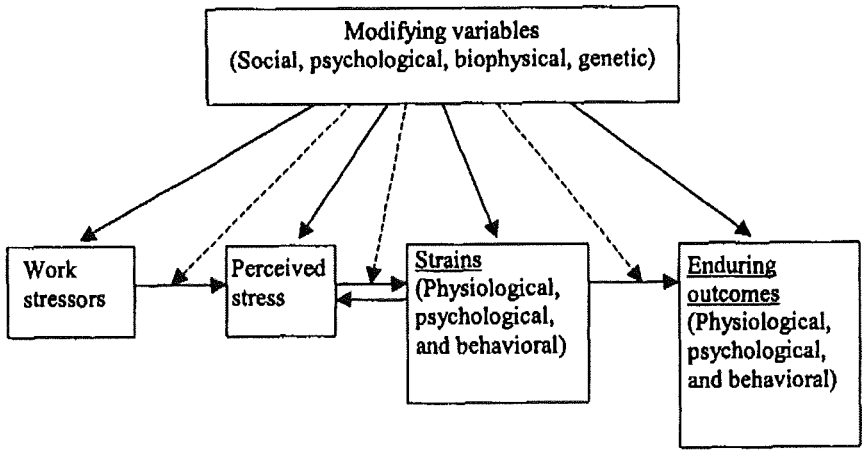

Fig. 2. The Framework of Occupational Stress (Reprinted with permission from Israel, Schurman & House, 1989).

with strains, which represent a class of relatively short-term responses such as depression, declines in performance, or excessive absences. The premise underlying the reciprocal association is that of a "snow-ball" effect where the negative feelings regarding work (stress) increase strains which in turn contribute even more to the negative feelings. The end result, however, is that the accumulation of physiological, psychological and behavioral strains will eventually result in long-term outcomes such as acute depression, alcoholism, unemployment, physiological problems (e.g. cardiovascular), and other costly results. The framework, however, recognizes that either the model components themselves or the associations between them could be tempered by a host of modifying factors such as social support, and the quality of interpersonal relationships within the work environment.

Like the P-E fit perspective, House's framework has been the subject of much research. Larocco, House, and French (1980), for example, confirmed the importance of social support by noting that it was negatively associated with one of their many strain measures, depression. Further, social support interacted with job satisfaction (an index of perceived stress) in explaining the impact of satisfaction on depression. Further, Israel, Schurman, and House (1989) reported that interpersonal relationships at work (a modifying factor in the model) explained 16% of the variance of work stressors and 13% of negative job feelings. In addition, depression was significantly associated with low perceived control, poor interpersonal relationships, and high-perceived work stressors.

In summary, the framework of occupational stress has been used to predict psychological strain and general health status as affected by the work environment. Job satisfaction, depression, and anxiety have been well predicted within the theoretical framework. However, most studies employing this framework to develop their research questions have examined only some parts or certain path relationships, and not the entire framework together.

The Demand-Control-Support Model

The demand-control-support model of occupational stress (Karasek, 1979) emphasizes the role of work content as the major source of stress. As such, Karasek divided job content into two components: (a) worker perceptions regarding the tasks that need to be completed in performing the job (job demands); and (b) worker perceptions about the degree of control or discretion they have in performing the job tasks (job control). Karasek (1979) conceptualized that the two constructs interacted with each other in affecting the amount of strain (i.e. mental and physical health) experienced by employees. The strongest levels of strain, and hence, the greatest levels of occupational stress were expected to occur in situations where there were extremely high demands, but very low control. Influenced by the research of House (1981), social support was added as a third component (Karasek & Theorell, 1990). While not eradicating strain totally, social support was predicted to buffer it to some degree even under high demand-low control conditions. Figure 3 is a representative perspective within this stream of research.

Karasek (1979) operationalized demands in Fig. 3 as a class of psychological stressors at work such as, and for example, requirements for working fast and hard, having a great deal to do, not having enough time, and having conflicting role and job demands. Job control was similarly operationalized as the individual's potential control over the tasks and the conduct of work and workflow. That is, Karasek regarded job control as a worker's latitude to have power over the diverse job demands. Social support was viewed as enlarging the latitude of job control even more, and as such, benefiting the individual in the same fashion as job control by reducing or buffering experienced strains. Social support has been typically operationalized through employees' perceptions of the amount of supervisor and/or coworker support. As indicated by the demand-control-support model in Figure 3, the highest level of strain would be expected in the "high strain, isolated" group. Workers in this group experience very high demands, and low control, and also perceive themselves as having no social support. Even with social support, low levels of psychological well being and fairly high levels of strain are still expected for those

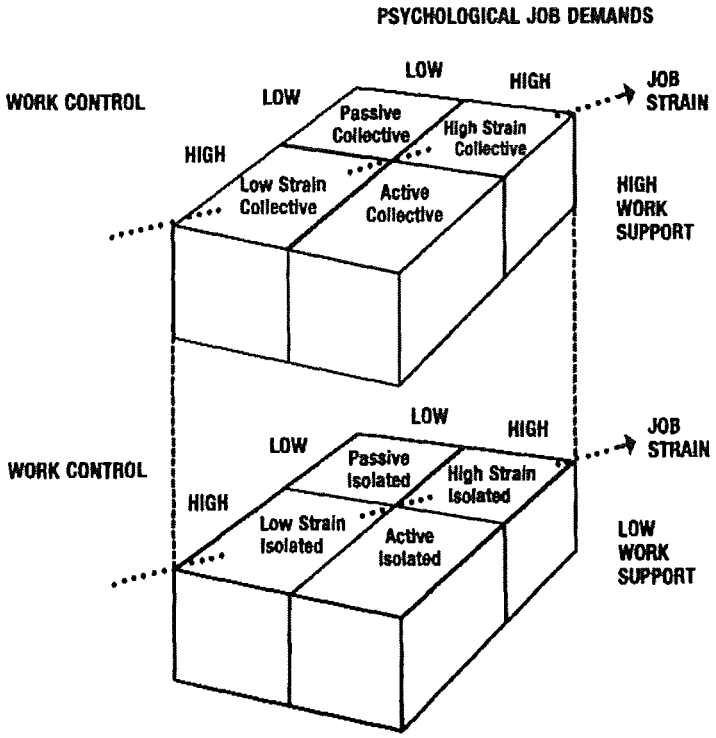

Fig. 3. The Demand-Control-Support Model
(Reprinted with permission from Johnson & Hall, 1988).

employees experiencing high demands and low control. As with the P-E fit model and the framework of occupational stress, researchers adopting the demand-control-support perspective have relied on multiple variables to operationalize the primary components of the model. For example, strain has been variously operationalized as cardiovascular disease, hypertension, anxiety, depression, somatic symptoms, and general mental well being (e.g. Karasek, Baker, Marxer, Ahlbom & Theorell, 1981; Mausner-Dorsch & Eaton, 2000). Research, however, has been generally supportive of the model. For example, more than one third of the published studies using the demand-control-support model have found clear effects of low job control, heavy job demands, and low support on elevated heart disease risk (Theorell & Karasek, 1996). Further, in a 9-year longitudinal study, Johnson, Hall and Theorell (1989) reported that men who belonged to the most favored 20% (low demand, high control, and

high support) lived eight years longer on average than did the 20% of men in the least favored group (high demands, low control, and low support).

In summary, the demand-control-support model has been used primarily to predict psychological strain and cardiovascular disease risk, and has been very effective in this role. Further, research has generally supported many more main effects for demands, control, and support than interaction effects. Among the main effects, job control has emerged as the strongest factor determining strains (Kristensen, 1995).

Summary

All three perspectives have provided very solid foundations from which to address questions regarding occupational stress. Among the conclusions to be drawn from the review are the following. First, researchers have clearly not settled on one operationalization of any of the model components, but rather have relied on a host of variables to operationalize each component. Their approach, therefore, is very different from the traditional technique whereby a model component is typically anchored to a single operationalization. While there is nothing inherently wrong with adopting a multivariate approach for representing a given component, it presents some unique challenges that have yet to be addressed in this body of research. For one, it implies that there is possibly a common element, or higher-order latent construct linking together all of the variables operationalizing a given component. It would seem, therefore, that a more powerful test of the frameworks would be one that is conducted at this higher-order level. As it currently stands, even when researchers have appropriately applied multivariate statistical procedures, the results are still variable-to-variable. Therefore, there has not been a true test of these frameworks as specified by their respective proponents.

Another conclusion to be drawn from the review of the three models is that each has a narrow perspective. Underlying this observation is the fact that many of the same variables used in defining components for the occupational stress models are exactly the same as those used in proposing other models observed in the organizational sciences. Occupational stress researchers have largely ignored the research in other disciplines of the organizational sciences, and vice versa; that is, one field typically does not reference the work of the other field. The stance of the current authors is that it is absolutely fruitless to debate whether the configuration of the same variables under a pure occupational stress framework is better or worse than a different configuration driven from one of the other disciplines' frameworks. Rather, a more fruitful approach is to recognize the fact that each framework is devoted to understanding the elements of

the work organization that promote the well being of not only the individual, but also the organization, and in a broad sense, society. Thus, there is a need to take an integrative perspective that combines the best elements of all frameworks. Taking an integrative approach whereby the elements from other disciplines are brought into the framework will provide some needed conceptual clarity. It is to that integrative approach, the healthy work organization, that the chapter now turns.

THE HEALTHY WORK ORGANIZATION

The following conceptual description of the healthy work organization borrows liberally from a manuscript written by two of the co-authors and that is currently unpublished (DeJoy & Wilson, 2002). Hence, foregoing having to continuously repeat the reference, DeJoy and Wilson (2002) are given primary credit for developing the perspective presented here.

The National Occupational Research Agenda (NIOSH, 1996) identified work organization as one of the national occupational safety and health research priority areas. Work organization was also highlighted in *Healthy People 2010* (U.S. Department of Health and Human Services, 2000) as an important factor in understanding the effects of conditions of employment on the health and well being of employees. Work organization generally refers to the way work processes are structured and managed, including, but not limited to, scheduling, job design, management style, organizational effectiveness, and employee work adjustment. The addition of the term "healthy" to work organization derives from the idea that it is possible to distinguish healthy from unhealthy work systems; that is, some work processes result in healthier outcomes than do other work processes. A key assumption of the healthy work organization is that creating and maintaining such organizations is good for all stakeholders – employees, shareholders (and others concerned with financial performance), and society in general.

Healthy work organization has several important implications for how we view the work-health relationship. First, placing emphasis on how work is structured and organized suggests that the very operational and functional fabric of the organization has a direct impact on employee health and well being (Danna & Griffin, 1999). Second, combining the term "healthy" with the term "work organization" connotes an integrative perspective bringing together viewpoints and findings from a number of disciplines and specialties, including not only traditional workplace health areas such as occupational stress and worksite health promotion, but also organizational behavior, human resources management, and economics (Danna & Griffin, 1999; Lindstrom, 1994; Sauter, Murphy & Hurrell,

1990). And third, healthy work organization brings a human capital orientation to workplace health and highlights potentially important linkages between preserving and enhancing human capital and maximizing business strategy (Becker et al., 1997; Goetzel & Ozminkowski, 2000; Smith, Kaminstein & Makadok, 1995). In short, there are parallel benefits in that "healthy" organizations should be better able to attract and retain productive workers, *and* they should be more successful in managing costs and competing in the marketplace than would "unhealthy" organizations. However, research progress toward testing these benefits has been hampered by isolated and fragmented efforts and the relative absence of testable conceptual models or frameworks (Cooper & Williams, 1994; Cox, 1988; Jaffe, 1995; Sauter, Lim & Murphy, 1996; Smith et al., 1995).

In order to address this shortcoming, we assembled and clarified the various conceptual and theoretical perspectives that converge on the concept of the healthy work organization. The end result of this work is the model presented in Fig. 4.

The model in Fig. 4 provides an overall architecture for portraying the substance or content of the healthy work organization, and provides context and direction for future research and practice. The model is based on our conceptual definition of the healthy work organization as *one characterized by intentional, systematic, and collaborative efforts to maximize employee well being and productivity by providing well-designed and meaningful jobs, a supportive social-organizational environment, and accessible and equitable opportunities for career and work-life enhancement.*

To help the reader to understand the rationale underlying the model in Fig. 4, the section immediately following is devoted to discussing the five core conceptual themes underlying the model in general. Space constraints limit us to a summary of those themes at this point, but the interested reader is referred to DeJoy and Wilson (2002) for a detailed presentation. Following the summary, a lengthy presentation of each component and its constituent constructs is presented.

Core Perspectives Underlying the Healthy Work Organization

The job stress literature provides a rich underlying perspective for developing a model of healthy work organization (e.g. Cox, 1988; Cooper & Cartwright, 1994; Lindstrom, 1994), but several other research perspectives are also relevant. These include research related to: (a) human resources or organizational development (e.g. Jaffe, 1995; Rosen & Berger, 1991); (b) occupational safety and health (e.g. Cox & Howarth, 1990; DeJoy, Murphy & Gershon, 1995); and (c) integrative or multi-level health promotion (e.g. Goetzel, Jacobson, Aldana, Vardell & Yee, 1998; Pelletier, 1984; Pfeiffer, 1987).

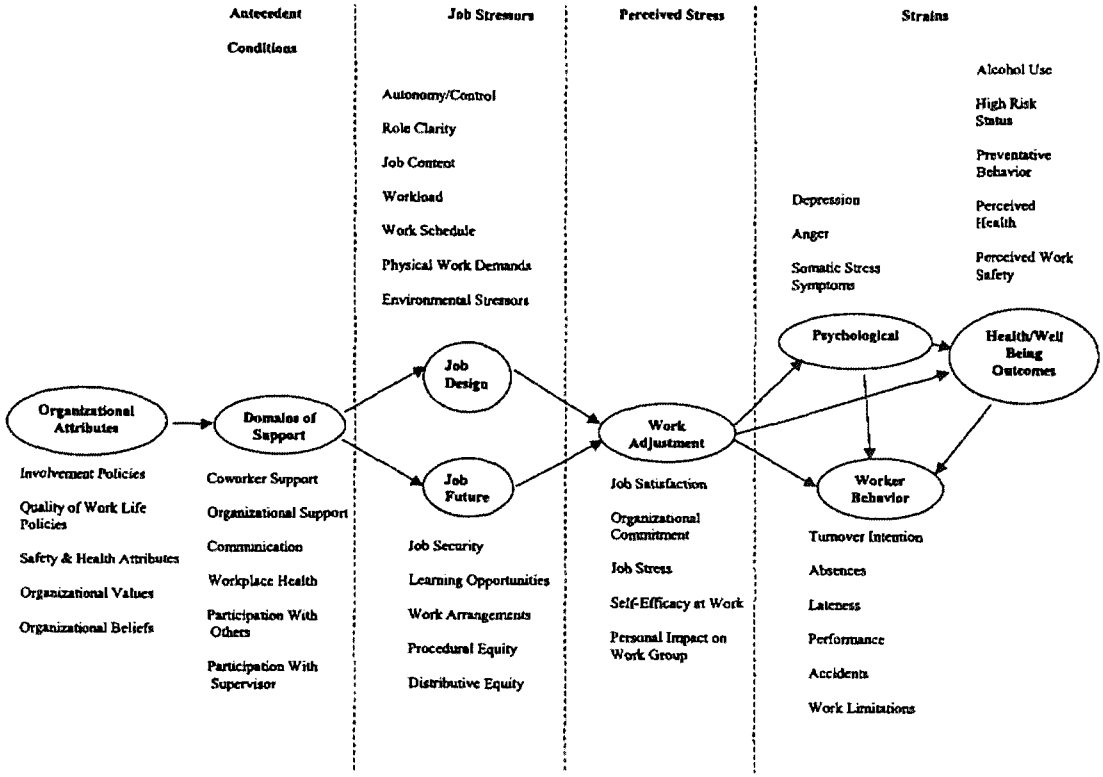

Fig. 4. The Healthy Work Organization.

Table 1 provides exemplars and summarizes the themes or defining aspects evident in these various core perspectives.

When viewed together, at least five broad themes emerge from the perspectives: (1) the increased salience of organizational factors in the work-health relationship; (2) the importance of organization-level action in producing positive change; (3) the need to modify the traditional employer-employee relationship in terms of increased opportunities for information exchange and employee involvement; (4) the view that healthy work organization involves multiple domains of work life; and (5) the expansion of organizational effectiveness to accommodate both employee and business outcomes. The far right column in Table 1 contains overall estimates of the prominence of each theme within each perspective.

The themes related to the role of organizational factors and to the importance of organizational change are highly apparent in each of the perspectives and suggests the need for some modification of the exchange relationship between employees and organizations in terms of increased levels of both upward and downward communication and enhanced levels of employee input and control. The theme that healthy work organization involves multiple domains of work life (theme 4) follows from the basic idea that healthy work organization is more than well-designed jobs. From the four perspectives, there would appear to be three fairly broad work domains. The first domain does involve the demands, characteristics, and requirements of the job itself. The second domain shifts attention to the interpersonal, social, and organizational environment at work, and the third domain addresses the overall employment relationship in terms of security, fairness, and access to opportunities. Finally, central to thinking about healthy work organization is the idea that organizational effectiveness is the end-result of healthy work organization (theme 5). However, this conceptualization of effectiveness should be expanded to include outcomes related to employee health and well being as well as more conventional indices of organizational success such as productivity, profits, shareholder value, and so forth. The interplay between these different but presumably related sets of effectiveness outcomes is a key aspect of healthy work organization. In summary, all of the core perspectives have a common element, and that is, that the healthy work organization recognizes that its basic operational and structural fabric (i.e. how its work is organized) can fundamentally facilitate or impair overall effectiveness in terms of both employee and business/mission performance.

Healthy Work Organization Model Components

In one way or another, all four perspectives call attention to six fairly distinct but interrelated components of work life (see Fig. 4): (a) core organizational

Table 1. Summary of Conceptual-Theoretical Perspectives Related to Healthy Work Organization

Core Perspective	Exemplars	Principal Themes
Human Resources/ Organizational Development	Healthy Companies/Organizations (e.g., Jaffe, 1995; Rosen & Berger, 1991) Learning Organizations (e.g., Senge, 1990) High Performance Work Systems (e.g., Huselid, 1995) High Involvement Work Processes (e.g., Lawler, 1992)	Importance of organizational context *** Organizational change orientation *** Employee participation/empowerment *** Multiple domains of work life *** Expanded view of organizational effectiveness **
Expanded Occupational Stress Model	Psychosocial Work Organization (e.g., Lindstrom, 1994) Organizational Stress/Comprehensive Stress Management (e.g., Cooper & Cartwright, 1994; Israel et al., 1989) Demand-Control Model (e.g., Karasek & Theorell, 1990)	Importance of organizational context *** Organizational change orientation *** Employee participation/empowerment ** Multiple domains of work life ** Expanded view of organizational effectiveness *
Organizational Safety and Health Management	Safety/Health Climate/Culture (e.g., Zohar, 1980) Human Error/Management Systems Failure (e.g., Hofmann et al., 1995) Self-Protective Behavior (e.g., DeJoy et al., 1995)	Importance of organizational context *** Organizational change orientation *** Employee participation/empowerment ** Multiple domains of work life * Expanded view of organizational effectiveness *
Integrative Worksite Health Promotion	Integrative/Multi-Level Programming (e.g., Pelletier, 1984) Ecological Models (e.g., McLeroy et al., 1988) Health Promotive Environments (e.g., Stokols, 1992)	Importance of organizational context *** Organizational change orientation *** Employee participation/empowerment ** Multiple domains of work life ** Expanded view of organizational effectiveness **

Note: Asterisks are used to denote the extent to which the theme is evident within the particular theoretical-conceptual perspective: * = Low; ** = Moderate; *** = High.

attributes; (b) domains of support; (c) job design; (d) job future; (f) work adjustment; and (g) organizational effectiveness, including indices of individual well being and work-related behavior and of organizational-level performance. Only the three sets of individual indices are noted on Fig. 4, psychological outcomes, work behaviors and health/well being outcomes, but the expectation is that these would have collective influences upon organizational-level indices such as financial performance, human resource costs (e.g. turnover, training), and healthcare costs. The following paragraphs discuss each of the model components, and their underlying operational variables moving from left to right in Fig. 4.

Core organizational attributes. Core organizational attributes are portrayed as the principal driving or enabling forces in the creation and maintenance of healthy work organizations. On an objective level, attributes refer to both the formal written policies and procedures of the organization, and the "unwritten" ones that come in the form of organizational norms and that are simply "understood." As is well documented in the organizational climate literature (e.g. Vandenberg et al., 1999), though, it is not the actual "black-and-white" statement of such policies or the simple presence of unwritten norms that ultimately influence employee workplace attitudes and actions, but rather it is the employees' interpretation of those attributes. At one extreme of interpretation is total unawareness of the attributes, and consequently, the attributes would have no influence whatsoever on employee workplace behaviors and attitudes. At the other extreme of interpretation is a perfect understanding of the attributes, and letting workplace actions be guided solely by them. The reality, however, is that employees have some level of awareness of these attributes, and employees' interpretations of the attributes are filtered resulting in an imperfect understanding of the "true" meaning of those attributes. It is this perceived reality, nevertheless, that ultimately guides workplace behaviors and attitudes. Thus, the focus of the healthy work organization model is on employees' perceptions of the attributes, and not on some objective assessment of the existence of those attributes. Using the literature underlying the four perspectives as guide, we identified five sets of attributes that are relevant to a healthy work organization.

Referring to Fig. 4, the three attribute sets – *involvement, quality of work life (QWL), and safety and health* – are treated simultaneously, because they refer to employees' perceptions of the policies defining each of those categories. Polices and programs can be thought of as the surface manifestations of deeper held organizational values and beliefs. Human resources-related policies impact how employees experience life within an organization, and such policies are

among the more readily observable expressions of the organization's basic values and beliefs about its people. Jamieson and O'Mara (1991) argue that the encouragement of personal health within an organization requires policies in several important areas, including informing and involving people, and supporting lifestyle and life needs. Other researchers (e.g. Hale & Hovden, 1998; Hofmann et al., 1995) add "providing a safe and healthful work environment" as another broad policy area that expresses the organization's basic beliefs in maintaining a healthy work environment.

Turning to the *organizational-values* attribute set, we adopted Rokeach's (1979) conceptualization of values as being relatively lasting principles about the kinds of behaviors or end-states that are preferable to other entities such as the employing organization. Studies of successful companies suggest that these organizations typically have value systems that attend to all major stakeholders (e.g. Kotter & Heskett, 1992; Polley, 1987). Since the healthy work organization implicitly connotes an emphasis on the employee, there should be relatively strong values regarding the employees and their importance to the organization.

Organizational beliefs, the final attribute set, involve how the organization views its commitment to and responsibility for employee health and well being. At least two issues are important here. The first concerns general beliefs about the importance of healthy and satisfied employees to the overall success of the enterprise (Ribisl & Reischl, 1993). Of central importance is the idea that employees represent more than units of cost in the business equation. The second issue refers to a sense of shared responsibility for employee health and well being. This issue involves the idea that both individual behavior and organization-level action are important to protecting and enhancing worker health and well being (DeJoy & Southern, 1993; Sandroff, Bradford & Gilligan, 1990).

Domains of social support. As seen in Fig. 4, the core organizational attributes are expected to directly influence the second model component, domains of social support. The premise underlying this expectation is that a major outcome of perceiving sets of attributes that have the employees' health and well being at their core is a strong sense of support. That is, the employees sense that there are provisions for succeeding in their organizational roles, but in a manner conveying that they have an active role in that success. Specifically, the domains of social support emphasize interpersonal relations and the social/organizational environment at work. The healthy organization should provide opportunities for meaningful interpersonal interaction and communication, both for purposes of emotional support and for instrumental or tangible support in fulfilling job tasks

and other assigned responsibilities. In comparison to job design (discussed below), evidence is less consistent for enumerating specific dimensions, however, organizational or management support appears to play a central role in shaping a healthy work organization (Cox & Howarth, 1990; Ribisl & Reischl, 1993; Zohar, 1980). There are also clear themes for the importance of meaningful employee participation and related needs for open and effective communication (DeJoy & Southern, 1993; Hale & Hovden, 1998; Karasek & Theorell, 1990). Based on the four perspectives presented in an above section (see Table 1), we identified five key dimensions – organizational support, coworker support, participation with others and supervision, communication, and safety and health climate.

The dimensions of *coworker and organizational support* may be defined as any action originating from these sources indicating a concern for the well being of the employee (Eisenberger, Huntington, Hutchison & Sowa, 1986; Jayaratne & Chess, 1984). Research has generally indicated that positive social relations, both at work and outside of the workplace, play a role in that the adverse effects of exposure to various job demands and hazards are likely to be more severe when these relationships provide little support (Karasek, Schwartz & Theorell, 1982; Stewart, 1989). Further, these forms of support, particularly organizational sources, connote a sense that there is a future within the organization. However, in terms of which source is expected to have the greatest impact, coworker support should be the strongest given that employees identify more closely with proximal relationships (i.e. among coworkers) than with distal relationships (i.e. the organization) (Larkin & Larkin, 1996).

Participation with others and with the supervisor refer to work situations in which an employee has meaningful input into job-related decision-making regardless of whether it is in interaction with the supervisor or with others such as coworkers (Vandenberg et al., 1999). The considerable literature on participation shows a wide range of effects in the fields of management, organizational behavior, industrial psychology, and communications. A significant majority of studies have emphasized job satisfaction, motivation, and productivity; however, participation in decision-making has also associated with diminished job stress, the use of active problem-solving strategies, and better mental health (Jackson, 1983; Spector, 1986). Participation in decision-making serves also to enhance employee understanding, perceived control, and communications (Ganster, 1989).

High quality *communication* from multiple sources has shown positive effects on role ambiguity, job performance, job stress, and worker satisfaction (Frone, Russell & Cooper, 1995). Performance feedback is especially important and includes both formal (i.e. performance appraisals and posted job requirements)

and informal feedback (i.e. reminders of workplace norms and interaction of workers) from multiple sources including managers, supervisors, and coworkers (Hackman & Oldham, 1980). Studies have also linked effective communication and feedback to safety and health program effectiveness (Schurman & Israel, 1995), positive safety climate (DeJoy et al., 1995), and a variety of safety-related behaviors and outcomes (McAfee & Winn, 1989).

The perceptions of employees with respect to receiving support for their personal *safety and health* on the job have emerged as an important aspect of organizational climate. Indeed, attention to organizational factors supporting occupational safety and health has expanded to such an extent that Hale and Hovden (1998) regard it as the "third age of safety." Some of the evidence pointing to the importance of support factors includes research on safety program effectiveness (Cohen, 1977), workplace accidents and errors (Hayes, Perander, Smecko & Trask, 1998), and compliance with safe work practices and the use of personal protective equipment (DeJoy et al., 1995).

Job design. Job design involves the demands and other aspects of the specific job or work situation, or what DeJoy and Southern (1993) refer to as the immediate job-worker interface. As noted at the start of this chapter, the literature on occupational stress and health provides much of the basis for identifying the job-related factors associated with healthy work organization. That is, recent reviews of this literature (e.g. Cooper & Cartwright, 1994; Lindstrom, 1994; Sauter et al., 1990) reflect general agreement on the job or task factors, which are most important in preserving or enhancing worker health and well being. Further, the research reviewed in the section above on dimensions of organizational support, in addition to the cumulative research on House's (1981) and Karasek's (1979) occupational stress frameworks, makes it fairly clear that the dimensions of job design are strongly influenced by the domains of social support. Seven dimensions were selected to represent the job design component in Fig. 4. The healthy work organization provides jobs that involve reasonable workloads, meaningful and worthwhile tasks, and adequate levels of control, and clear job expectations. Work schedule also is an important element of job design, and jobs should be performed in a work environment that minimizes physical work demands, and exposure to environmental stressors.

Autonomy/control is the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling work tasks and determining the procedures to be used in carrying them out (Hackman & Oldham, 1980). Employees who perceive high levels of control at work have tended to report higher levels of motivation, job satisfaction, involvement, and commitment, as well as lower levels of absenteeism, turnover, emotional

distress, and physical symptoms, including exhaustion, headaches, and cardiovascular disease than those employees with less control and autonomy (Greenberger, Strausser, Cummings & Dunham, 1989; Karasek et al., 1981; Spector, 1986). Evidence also suggests that job redesign interventions intended to increase autonomy/control can be effective at reducing many of the latter negative outcomes (e.g. Landsbergis & Viona-Vaugh, 1995).

Role clarity is often defined as the extent to which an employee's work goals and responsibilities are clearly communicated and the degree to which the individual understands the actions and processes required to achieve these goals such that there is minimum role ambiguity and role conflict (Hackman & Oldham, 1980). Occupational stress research has long supported that role ambiguity and conflict are stressful events because they add to the uncertainty of a work situation and reduce the extent to which workers have control over the job. Role conflict and ambiguity have been associated with burnout, increased job stress, work dissatisfaction and decreased productivity and commitment (e.g. Adkins, 1995). Adverse psycho-physiological responses such as increased heart rate and blood pressure have also been linked to low levels of role clarity (French et al., 1974; French et al., 1982).

Meaningfulness and skill utilization have been identified as important dimensions of *job content* (Hackman & Oldham, 1980). In general, tasks which are narrow, fragmented, highly repetitious, monotonous, and that otherwise provide for little stimulation or skill utilization, have been associated with job dissatisfaction, job stress, and poor mental health (Cox, 1988; Levi, 1981).

An employee's *workload* consists of the daily demands of the work situation or job design. Quantitative overload ("too much" work) and qualitative overload ("too difficult" work) have been associated with an assortment of psychological, physiological, and behavioral strain symptoms among employees (Frankenhaeuser & Johansson, 1986). Job satisfaction also appears closely linked to workload and job design (Greenberger et al., 1989). Strain may be most likely to occur when control is not commensurate with job demands, and social support is lowest (Karaek et al., 1981).

Employees who possess their preferred *work schedule* have been found to have increased job satisfaction, work commitment, and generally, positive work-related attitudes (Morrow, McElroy & Elliot, 1994). Further, day shift workers have been found to hold more favorable work-related attitudes than other shifts. In addition, higher levels of job satisfaction and organizational commitment have been shown for fixed shift workers as compared to rotating shift employees and for full-time vs. part-time employees (Lee & Johnson, 1991). Rotating shifts and permanent night work appear to be most problematic in terms of psychological, social, and physical well being.

A number of studies highlight the adverse impacts of *environmental stressors* and *physical work demands* on employee health and safety outcomes (e.g. Baker & Landrigan, 1990; Gustavsen, 1980). Environmental conditions can effect the employee's well being through exposure to such factors as loud noise, inadequate ventilation, bad lighting, variable temperatures, smoke and toxic chemicals (Rasanen, Notkola & Husman, 1997). Musculoskeletal symptoms and injuries due to physical work demands (e.g. highly repetitive tasks and frequent bending, twisting, and heavy lifting) have had similar influences on employee adjustment to work.

Job future. Based on reasoning from Sauter et al. (1990), we added a model component that shifts attention to job security and career development considerations. Our selection of the term 'job future' was intended to represent a multi-dimensional workplace domain that is more complex than simple job security. Specifically, the job future model component focuses on the employment or exchange relationship between employers and employees, and includes job security, equity, and related career development considerations. Previous attempts to model healthy work organization have either emphasized job demands and stressors to the relative exclusion of the other areas (Danna & Griffin, 1999), or have concentrated on the deeper structures of organizations (values or culture, etc.) without specific attention to how these fundamental attributes translate into specific job characteristics (Sauter et al., 1996). The underlying premise of job future is that employees in healthy work organizations should be clearly informed about opportunities for improving their job skills and career opportunities, as well as about the organizational and economic developments that may alter their employment situation (Sauter et al., 1990). Figure 4 indicates that the domains of social support are expected to have a direct association with job future. Since job future perceptions are shaped by the exchange relationship with the organization, it is the perceived support domains that convey the clearest message to employees as to what the organization is willing to give to them. Five dimensions are proposed for this model component: (a) job security; (b) procedural equity; (c) distributive equity; (d) learning opportunities; and (e) flexible work arrangements.

Job security has been defined as an employee's perception of a potential threat to continuity in his or her current job. Job security has been found to be positively related to job satisfaction, work commitment, quality of life, and mental and physical health (Heaney, Israel & House, 1994). *Learning opportunities* for increased job mastery and expanded skills for coping with change have assumed increasing importance in describing healthy work organization (Cooper & Cartwright, 1994; Lindstrom, 1994). In fact, such opportunities may represent an

essential tradeoff in response to altered expectations about job security in the traditional sense. That is, today's workforce is very conscious about the "shelf-life" of knowledge and job positions, and that maintaining up-to-date knowledge, skills and abilities is needed for both internal movement within an organization, but most importantly, for obtaining positions with other organizations in the event that they are asked to leave their current workplace. Hence, most contemporary workers view learning opportunities as a mechanism to maintain their employability, and have a strong link to work adjustment indices such as job satisfaction and organizational commitment (Vandenberg et al., 1999).

Historically, perceptions of equity have been unquestionably the benchmark for operationalizing the fairness of the exchange process between employees and employers (Adams, 1963). From its long and rich research history, two forms of equity have emerged (Greenberg, 1986). *Distributive equity* represents the perceived fairness attached to the amount of rewards (e.g. merit pay increases) and their allocation along some performance criterion. *Procedural equity* entails the perceived fairness as to how the rules governing the reward system are applied across people. While the two forms of equity may have associations with different indices of employee work adjustment (Vandenberg & Lance, 1992), collectively between the two, they have associations with job satisfaction, organizational commitment, and perceptions of job stress.

Flexible work arrangements, including where one works, how much one works, and whether flextime is an option, allows the employee to have more control over his or her job. For many workers, flexible work arrangements provide the accommodations needed for managing child care, furthering education, and planning for retirement. Positive relationships have been found between flexible work arrangements and depression, anxiety, job satisfaction, and work-family conflict for both men and women (Morrow et al., 1994).

Work adjustment. The concept of employee work adjustment has an essential role within applied psychology and organizational behavior (Hulin, 1991; Lance, Vandenberg & Self, 2000; Vandenberg & Self, 1993). As applied in those disciplines and as used here, work adjustment refers to employees continuously interpreting, and when required, revising both the meaning of work as it pertains to a particular organization and the view of themselves as functioning members of their organizations (Vandenberg & Self, 1993). Positive adjustment occurs to the extent that the interpretations and possible revisions are mutually beneficial to both the person and the organization. Negative adjustment is reflected in a weakened linkage or bond between the person and organization (Lance et al., 2000; Vandenberg & Self, 1993).

The work adjustment component of the healthy work organization model underscores the importance of subjective evaluation and individual meaning in understanding the potential effects of job design and job future on employee health and well being (Lindstrom, 1994; Renn & Vandenberg, 1995). Briefly, as alluded to in the above sections on job design and job future, a great deal of research evidence has accumulated indicating that employees indices of work adjustment covary with the various indices of job design and job future. Using this research literature as a basis, work adjustment in the healthy work organization was defined through four indices, job satisfaction, organizational commitment, psychological empowerment (including workplace self-efficacy, and perceived impact on the work group), and experienced job stress. Job satisfaction pertains to the employee's general level of satisfaction with the nature and circumstances of his or her current job. Organizational commitment emphasizes affective commitment, or the emotional attachment of the employee to the organization. Psychological empowerment involves the worker's sense of control, self-efficacy, or mastery in the workplace. Job stress emphasizes the individual's appraisal of the work situation and demands, and thus, is perceived stress rather than stressful conditions or stress symptoms.

Organizational effectiveness. Perhaps the key assumption of healthy work organization is that healthy work organizations should benefit both employees and the business. As such, this component should contain sets of relevant outcomes related to both aspects. Decisions about specific measures to include as indices of organizational effectiveness are beyond the scope of the present paper, and would likely vary considerably from one situation to another (e.g. for profit vs. non-profit organizations). However, this component might easily contain a combination of both subjective and objective measures, and some measures would be at the level of the individual employee while others would be aggregate or organization-level measures. Following the view that health is more than the mere absence of disease, health measures could include indices of emotional and social health and well being as well as physical health per se. Candidate measures might include: general health status, vitality, life satisfaction, somatic symptoms, health conditions, health risk behaviors, self-care /preventive behaviors, health care utilization, depressive symptoms, anger-hostility, and general psychological well being. On the business side, measures could include profits, sales, defects/waste, customer/client satisfaction, return on equity, occupational injury and illness, productivity, absenteeism, and employee turnover.

As indicated on Fig. 4, we limited the current model to three categories of individual level variables. The first category, psychological outcomes, was defined through employees' levels of depression, anger and somatic stress. The

second category consisted of several indices of employee health and well being. Specifically, alcohol use was defined as the total number of alcoholic beverages consumed per month per person. High-risk status was an index used to operationalize the degree to which an employee was at risk of contracting a severe disease or illness. It was created from several other measures tapping whether or not employees used tobacco products, whether or not they had high cholesterol, high blood pressure or other risk factors for major diseases, and whether or not they engaged in vigorous exercise. Preventive behaviors was also an index created from a composite of measures including whether or not they are screened regularly for cholesterol, high blood pressure and other risk factors (cancer, diabetes), and whether or not they protected themselves from exposure to the sun. The final indices, perceived health and perceived safety of the work environment, were intended to tap employees' own feeling of well being from both an internal (own health) and external (work environment) perspective.

We recognize that the psychological and health/well being outcomes are primarily driven by factors outside of the workplace. What cannot be denied, particularly with the research evidence accrued within the occupational stress arena, is that the workplace contributes significantly to those outcomes as well. Our intention in the model, therefore, is to indicate that while individuals may enter an organization with baseline levels of each outcome, those outcomes can vary either upward or downward as a function of the employee's own experience at work. Due largely again to the research in occupational stress (particularly those models relating perceived stress to short-term and long-term strains), the expectation is that these outcomes would vary with levels of employee adjustment to work. That is, employees who are highly satisfied, strongly committed, experience little job stress, and have strong self-control (positive work adjustment), are most likely to have less depression, anger and somatic stress than employees with negative work adjustment. Further, those with positive work adjustment are most likely to show reduced alcohol use, lower their high risk status and engage in more preventive behaviors.

The third category of individual-level outcomes in Fig. 4 is generally referred to as worker behaviors. It is characterized by a set of behaviors that are expected of employees in most situations. Namely, employees are expected to maintain longevity (i.e. have low turnover intentions), not abuse the absence or lateness policies, perform at an adequate level, engage in behaviors that minimize the risk of work-related accidents, and similarly not engage in any activity both in and out of the workplace that may limit a person's ability to perform at acceptable levels. As indicated on Fig. 4, this category is expected to be directly

influenced by work adjustment, psychological outcomes and health/well being outcomes.

Summary

There is a set of labels (e.g. job stressors) at the top of Fig. 4 that are commonly used among occupational stress researchers to characterize the component constructs within that column. The use of the labels should not be construed as linking the healthy work organization model exclusively to an occupational stress research framework. We could have just as easily put labels from other conceptual models in those same places. For example, the label "core job characteristics" from Hackman and Oldham's (1980) job characteristics model could replace the current "job stressors" label. Our point is that regardless of the cause (e.g. disciplinary "siloing," purposeful ignorance of ongoing research in other disciplines, etc.), there has been a great deal of conceptual redundancy across research streams in that the same constructs are being used to characterize components within different conceptual models. This would not be an issue if occupational stress researchers, for example, had a single construct labeled "job stressors," or "perceived stress," and developed a single operationalization of that construct. However, it is understandable that they have not done so because their overriding concern is in determining how individual experiences within the workplace (and as captured in constructs such as support, job demands, job satisfaction, etc.) collectively come together to determine whether the individuals are working productively in a manner that is not only "good" for the organization, but also for those individuals, and society as a whole. The "good" in this case refers not only to performance (i.e. number of units produced, contacts made, etc.), but also to the fact that the work experiences can affect the health of individuals, and therefore, determine health costs. Thus, unlike Selye (1983) who coined the term "stress" to refer to a specific individual reaction, the term "occupational stress" is used to characterize a process model.

The main thrust of the healthy work organization model is to highlight the fact that regardless of the discipline, the central focus of all models in which these constructs are components, is the health and well being of the individual. Further, the argument given to organizations as to why they should be concerned with individual health and well being is that not doing so has tremendous costs to the organization. Given that many organizations have little advantage over competitors in terms of goods and services, and therefore, operate within small profit margins, they compete at the level of costs; that is, those organizations that control costs will be the industry leader in terms of profits (Vandenberg

et al., 1999). The following pages present an empirical test of the healthy work organization model.

TEST OF THE HEALTHY WORK ORGANIZATION MODEL

The intent of the following analyses is to present evidence that the healthy work organization model is a viable framework in which to test and generate hypotheses regarding individual responses to the workplace. This section is organized much like the methods and results sections of traditional journal articles. That is, the next sub-section is a condensed methods overview beginning with a description of the sample and research sites, and ending with an overview of the analytical procedures. Some of the material is condensed to conserve space, but in all cases, the interested reader may contact the authors to receive additional information. Following the methods sub-section is a sub-section devoted to the outcomes of the analyses.

Methods

Respondents

The sample consisted of 3930 employees from 21 stores of one retail organization. The stores were located in the Southeastern United States, and varied in size from 150 to 375 employees. The 3,930 respondents represented over 50% of all employees in the 21 locations. Surveys were administered onsite at each store during two consecutive workdays. Questionnaire responses were completely anonymous and participation was encouraged but voluntary. As an incentive, employees were given time on the clock to participate, and provided a relatively quiet environment (a training room) in which to complete the survey. Completed questionnaires were deposited in locked storage boxes by the respondent to reinforce the confidentiality of the information. Within the sample, 24% had supervisory responsibilities, 54% had worked for the organization two or more years, 65% were male, 57% were married or cohabitating with a partner, 97% had a high school education or higher, and 73% were Caucasian. Further, they worked an average of 40 hours per week.

Survey Development

To conserve space, a detailed presentation of the survey development process is not given here, but is available upon request from the authors. Briefly, standard survey development procedures (Hinkin, 1995; Lance & Vandenberg, 2002) were strictly adhered to, and included: (a) item selection/generation based on a

comprehensive review of the research literature; (b) presentation of items to subject matter experts for sorting into appropriate conceptual categories; (c) administration of preliminary item set to a small sample for purposes of exploratory factor analysis; (d) after refining item set based on step (c), items were presented to a large sample for purposes of confirmatory factor analysis; and (e) item set was presented to another large sample six months later for purposes of cross-validation. The final step, (e), consisted of fixing the factor loadings of the second sample to those of the first CFA sample (step (d)) to determine if there is a significant loss in model fit. Collectively, the results at all steps supported the validity of the survey instrument. The end result was a survey instrument with nearly 200 items representing approximately 30 first-order constructs.

Measures

The description of the scales below follows the order of the categories from left to right on Fig. 4. That is, it begins with the organizational attributes and ends with the outcome variables under worker behaviors. All items are scaled on five-point Likert scales unless otherwise noted.

Organizational attributes. Values refer to the internalized normative beliefs, which guide behavior and desired end-states within organizations (Rokeach, 1979). While there are different "value sets" (e.g. people, production, etc.), the current focused on what O'Reilly, Chatman and Caldwell (1991) referred to as values with an employee orientation (e.g. tolerance). The six-item measure asked respondents: "thinking about your company or organization as a whole, how characteristic are each of the following traits," and they were subsequently presented with the six traits (alpha = 0.89). *Beliefs* entail employees' perceptions as to how strongly the organization views its commitment to and responsibility for employee health and well being (Ribisl & Reischl, 1993). An example from the nine-item scale includes "employees should have a say in decisions that affect how they do their jobs" (alpha = 0.90).

An important attribute to reinforcing organizational values is the *organizational policies and practices* perceived by employees as the true boundary conditions in the sense that their actions are guided or bounded by them. This study focused on three themes underlying policies and practices, which were based largely on the work of Jamieson and O'Mara (1991), and of Vandenberg et al. (1999). All items regardless of theme asked respondents "to what extent does your company or organization as a whole have specific policies and/or programs in place for . . .". The first theme was policies and practices for high involvement work practices and consisted of 10 items ("incorporating changes or innovations suggested by employees or employee groups"; alpha = 0.93). The

second theme focused on policies and practices facilitating employees' abilities to balance work and non-work issues ("offering EAPs to help employees deal with stress, family problems, substance abuse, etc."; alpha = 0.85). The third theme was policies and practices reinforcing safety and health practices ("providing applicable occupational safety and health training"; alpha = 0.90). The scales for both the last two themes consisted of four items each.

Domains of social support. Organizational support involves the actions undertaken at the organizational level that encourage, bolster, or assist the employees in undertaking their tasks and responsibilities. Eisenberger et al.'s (1986) nine-item global measure was used in this study (e.g. "the organization really cares about my well being"; alpha = 0.91). *Coworker support* focuses on the informal social/interpersonal relationships that develop among peers. Ribisl and Reischl's scale (1993) was used to measure this construct ("my coworkers care about me as a person"; alpha = 0.92). Participation, in general, refers to a workplace in which employees are encouraged to involve themselves in some meaningful way with the people in the organization. The three-item *participation with supervisor* scale (Vroom, 1959) included items such as "do you feel you can influence decisions of your immediate supervisor regarding things about which you are concerned?" (alpha = 0.77). The three-item *participation with others* scale (Caplan, Cobb, French, Harrison & Pinneau, 1975) included items such as "I take part with others at my workplace in making decisions that affect me" (alpha = 0.88).

Communication is the extent to which employees see an effective information exchange within the organization. The eight-item communication scale used in the current study was adapted from Vandenberg et al. (1999), and included items such as "management gives enough notice to employees before making changes in policies and procedures" (alpha = 0.86). Finally, *safety and health support* involves the degree to which the safety and health of employees is promoted in the work environment. The seven-item scale used in the current study was a version of the NIOSH Safety Climate Scale (DeJoy et al., 1995). An example item is "there are no significant shortcuts taken when workplace safety and health are at stake" (alpha = 0.90).

Job design. Seven dimensions derived largely from reviews of the job stress literature (Cooper & Cartwright, 1994; Lindstrom, 1994; Sauter et al., 1990) were included as part of the job design component. An employee's *workload* consists of the daily demands of the work situation. This construct was measured with four items taken from a task demand scale developed by Klitzman, House, Israel and Mero (1990). An example of items included: "I am asked to do an excessive amount of work" (alpha = 0.78).

Autonomy (control) is the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out. The three-item scale contained in the Job Diagnostic Survey (Hackman & Oldham, 1980) were used in the current study (e.g. "my job permits me to decide on my own how to go about doing the work"; alpha = 0.77). *Job content* is the extent to which the job is viewed as being meaningful, valuable, and worthwhile. A six-item scale (House, McMichael, Wells, Kaplan & Landerman, 1979) was used to represent this construct ("I have an opportunity to develop my own special skills and abilities"; alpha = 0.80).

Role clarity is the extent to which an employee's work goals and responsibilities are clearly communicated and whether the individual understands the processes required to achieve these goals. The four-item scale adopted to measure this construct was adapted from Rizzo, House, and Lirtzman (1970). An example item is "there are clear, planned goals and objectives for my job" (alpha = 0.82).

Based both on the work of Johansson, Johnson, and Hall (1991), and "walk-throughs" of the store's work environment conducted by the authors, two scales were created to assess *environmental stressors* and *physical work demands*, respectively. The seven-item environmental stressors scale encompassed employees' perceptions of the potential hazards found in their immediate work areas such as the noise and poor lighting (alpha = 0.84). The five-item physical work demands scale assessed factors such as lifting and repetitive motions (alpha = 0.82). The five-item *work schedule* scale used in this study consisted of items from Morrow et al. (1994), with additional items developed by the investigators to reflect scheduling issues unique to the participating company "my work hours are unpredictable from one week to the next"; alpha = 0.84).

Job future. Five dimensions were included in the job future component. *Job security* consists of the employees' perceptions about the likely continuity of their employment with the organization. A five-item scale (Kuhnert, Sims & Lahey, 1989) was used to measure this variable ("I am afraid of losing my job"; alpha = 0.79). From the long and rich research history on equity, two forms have emerged as important in the study of organizations. *Distributive equity* represents the perceived fairness attached to the amount of rewards (e.g. merit pay increases) and their allocation along some performance criterion. *Procedural equity* entails the perceived fairness as to how the "rules" are applied across people. The current study used a four-item distributive equity scale, and a six-item procedural equity scale (Greenberg, 1986). An example

distributive equity item is "I am fairly rewarded considering my responsibilities" (alpha = 0.95). In contrast, the procedural equity scale included items such as "when pay and promotion decisions are made, all sides affected by the decisions have a say" (alpha = 0.95).

Learning opportunities entail employees' beliefs about available opportunities to learn new skills or keep current skills updated. Five items adapted from Vandenberg et al. (1999) were used to assess this dimension ("I am given a real opportunity to improve my knowledge and skills"; alpha = 0.90). *Flexible work arrangements* variable involves the extent to which job requirements limit employees' ability to fulfill various non-work obligations and activities. Bohen and Viveros-Long's (1981) six-item scale was used to measure this construct ("how easy or difficult was it to arrange time to do each of the following on a typical workday" with items including "go to a health care appointment" and "respond to the needs of your children or other family members"; alpha = 0.87).

Work adjustment. Job satisfaction examines how satisfied employees are with their specific work situation, tasks, demands, and responsibilities. The five-item scale used in the current study (Hackman & Oldham, 1980) included items such as "generally speaking, I am very satisfied with my job" (alpha = 0.81). While the latter scale focuses narrowly on the attributes of the job itself, *organizational commitment* represents the strength of employees' attachment to the company as whole. The nine-item version of the Organizational Commitment Questionnaire (Mowday, Steers & Porter, 1979) was used to measure this construct ("I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful"; alpha = 0.92).

Efficacy, in general, refers to a person's sense of mastery and confidence in their work role, and is typically considered an index of positive work adjustment. Adapting Spreitzer's (1995) perspective, we utilized two forms of efficacy in the current study. *Self-efficacy* refers to a person's own sense of confidence in his/her ability to effectively work at the job. This was measured with Spreitzer's three-item scale ("I am confident about my ability to do my job"; alpha = 0.81). The second form, *impact*, refers to a person's perception about their ability to meaningfully influence his/her workgroup or team. Again, Spreitzer's (1995) three-item measure was used ("my impact on what happens in my workgroup is large"; alpha = 0.88).

Job stress focuses on the employee's perceptions and reactions to stressors at work. The six-item scale was adapted from Cohen, Kamarck, and Mermelstein (1983), and included items such as "in the last month, how often have you been upset because of something that happened unexpectedly at work" (alpha = 0.88).

Effectiveness indices. As seen in Fig. 4, there were 3 categories of outcome variables: (a) psychological outcomes; (b) health/well being outcomes; and (c) worker behaviors. Three measures were used to represent the *psychological outcomes.* The first two measures, adapted from Ilfeld (1978), assessed depressive symptoms, and anger/hostility. Depressive symptoms were represented using seven-items (e.g. feel downhearted and blue, feel lonely; alpha = 0.86), and anger was operationalized with four items (e.g. feel easily annoyed, feel critical of others; alpha = 0.87). Respondents were asked to report how often they had experienced these symptoms or feelings during the past month, using a four-point scale: "never," "once in a while," "fairly often," "very often." The third measure, somatic symptoms, included seven symptom states generally associated with stress and/or anxiety (e.g. headache, heart beating hard, sweaty hands). Respondents indicated how often they had experienced these symptoms during the past month (alpha = 0.89).

The second category, health and well being outcomes, included five variables. The two variables used to assess alcohol consumption and high-risk status were adapted from the U.S. Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance Survey. The *alcohol measure* provided an overall measure of alcohol consumption during a 30-day period. It was the combination of responses to drinking frequency (number of days alcohol consumed per month) multiplied by quantity (number of drinks typically consumed on a day that alcoholic beverages were consumed). *High-risk status* was also created from a combination of responses to items including tobacco product use, and whether or not they have been diagnosed with high blood pressure, with high cholesterol or with diabetes. Higher scores denoted higher risk status.

A similar procedure was used to create an index of *preventive behaviors.* Briefly, both genders were asked how frequently they were examined by medical professionals for high blood pressure and cholesterol (1 = never had an exam to 5 = within the past 12 months). Similarly, both sexes were asked whether they protect themselves from sun exposure and had flu shots. For males, their responses to the latter four "baseline" questions plus another denoting whether they were screened for testicular cancer were averaged together. For females, their responses to the latter "baseline" questions were averaged also with their responses to questions regarding the frequency with which they had pap smears, breast examinations, and mammograms. Responses were coded such that the higher the score, the greater their engagement in preventive behaviors.

The remaining two variables, *perceived health* and *perceived exposure to safety and health hazards*, were designed to tap individuals' perceptions of their own well being. Perceived health ranged from 1 (poor) to 5 (excellent).

Similarly, perceived exposure to safety and health ranged from 1 (very unsafe) to 5 (very safe).

The final category of outcome variables (Fig. 4), worker behaviors, was represented by six variables. *Turnover intention* asked respondents to rate the probability that they are leaving the company in the next 12 months (1 = 0 to 20% to 5 = 81 to 100%). *Absences* were measured by asking respondents to denote how many days they were absent when scheduled to work but to not count scheduled days off in their calculations. The scale for the latter measure ranged from 1 (no days missed when scheduled to work) to 5 (four or more days missed when scheduled to work). *Lateness* was measured by asking individuals to rate how frequently they are late for work in an average month (1 = never to 5 = almost daily). *Performance* was operationalized by asking respondents to note how their supervisors rated their performance on their last appraisal (1 = unsatisfactory to 5 = outstanding). *Accidents* were represented by having respondents note how many accidents they were involved in on the job over the past 12 months. Finally, *work limitation* was created from responses to two items. The first item simply asked "yes" or "no" if the individual's capacity to work (either the kind of work or the amount) had been limited by some injury or health condition. Those responding "yes" were then asked whether the injury or health condition was caused by their job. A work limitation score of zero was given to all who responded "no" to the first question. A score of one was given to those who responded "yes" to the first question but "no" to the second. The highest work limitation score, two, was given to those who responded "yes" to both questions.

Analytical Procedures

There were two phases to the data analysis: (a) treatment of missing data; and (b) the test of the model.

Treatment of missing data. While it is common practice to use list-wise deletion to deal with missing data, doing so in the present case would have reduced the usable number of respondents by nearly 50%. The dramatic reduction in sample size is a severe problem with list-wise deletion and a reason why it has come under serious question (Little & Schenker, 1995). This is due to the fact that it eliminates a case if there is a missing response on even one item. For the present sample, only approximately 3% of the total number of responses (760,000 which is the total number of respondents times the number of items in the survey) was missing. Alternatively, experts recommend determining how much of the missing data is random vs. systematic, and then imputing values for those cases where data are randomly missing (Little &

Schenker, 1995; Muthén, Kaplan & Hollis, 1987; Roth, 1994). Applying this practice requires three steps. The first step is to eliminate cases where there are missing data on objective measures or single-item measures. For example, it is not viable to impute a value for someone who did not respond to whether they smoke or not, or who refused to specify the likelihood that they may leave the organization in the next 12 months. In other words, items that are best candidates for imputation are items from multi-item scales where all items are required to operationalize the construct (i.e. the total item set represents the content domain of the construct). This assumes of course that the scale begins with strong validity and reliability. In the present study, this first step indicated that 3063 cases out of the 3930 had responses on all single-item and objective measures used in the current study.

The second step requires an examination of the remaining cases to determine whether there are systematic vs. random patterns to missing responses. Unfortunately, no firm rules exist as to what constitutes one or the other pattern. An obvious "systematic case" would be a person who refused to answer any items of a particular scale. Thus, the data were examined for such cases, but none were found. Less obvious, though, is determining how many items have to have missing values to define a systematic pattern of "missingness" for a particular scale. Experts recommend a conservative 2/3rds rule (Roth, 1994). That is, a case is not considered missing at random if the respondent answered less than 2/3rds of the item set for a scale. In the current study, none of the 3063 respondents fell into that category.

The third and final step is to apply an imputation method to the missing values. It is beyond the scope of this manuscript to discuss the advantages and disadvantages of the different methods (excellent treatments may be found in Little & Schenker, 1995; Muthén et al., 1987; Roth, 1994). Given that our model was ultimately examined using structural equation modeling procedures, the expected maximization (full information maximum likelihood) multiple imputation procedure (LISREL Version 8.5; Du Toit & Du Toit, 2001) was applied to impute missing values.

Test of the model. The model in Fig. 4 was tested using a structural equation modeling approach. Again, only a brief overview of the technique is presented here, but a more detailed explanation is available upon request from the authors. Referring to Fig. 4, all of the variables listed in association with a model component were represented at the item level. "Involvement policies," for example, was actually a 1st-order latent variable defined through its respective 10 items. Similarly, and again for illustration, organizational commitment was construed as a 1st-order latent variable defined through its nine items.

Collectively, therefore, 31 1st-order latent variables (all of the variables listed with the model components except health and well being outcomes and worker behavior) were specified using 194 items. In turn, the 31 1st-order variables were used to define six 2nd- or higher order variables. For example, the 2nd-order "psychological outcomes" latent variable was defined through the 1st-order variables, depression, anger and somatic stress. Similarly, the 2nd-order "job future" variable was represented through its five 1st-order variables, job security, learning opportunities, communication, workplace health, participation with others, and participation with supervisors. Thus, excluding health and well being and work behavior outcomes for the moment, the hypothesized associations between ellipses on Fig. 4 were examined between these higher-order constructs.

Given no compelling conceptual reason to expect a 2nd-order latent variable to underlie the work behavior and health and well being outcomes, we treated each of the variables for those components as independent entities. As a result and for example, there were in reality six additional paths emanating respectively from the 2nd-order work adjustment latent variable and the 2nd-order psychological outcomes latent variable to the six worker behavior variables. There were an additional five paths from each of those 2nd-order constructs to each of the variables characterizing the health and well being component. Finally, there were 30 paths emanating from the health and well being component representing the hypothesized associations between worker behavior and health and well being.

Inferring support for the hypotheses was a two-step process. The first step was to examine the overall fit of the model to the data. This is an omnibus test that in practical terms asks whether or not the specification of the paths as conceptually supported is a reasonable reflection of the theoretical process underlying the variables. Assuming that it is, then the second step is to examine the statistical significance of each of the hypothesized paths to infer direct support for each expectation. It does not make sense to infer the statistical significance of the hypothesized paths without first asking whether the model itself is reasonable.

The issue of overall model fit, however, is itself complex and opinions vary (Lance & Vandenberg, 2001). While there are hosts of available fit measures, no single index of fit exists which unequivocally results in a clear fit/no fit interpretation. This is due to the fact that each fit index is characterized by its own strengths and weaknesses that in turn vary as a function of the characteristics of the model itself (e.g. sample size, model complexity, degrees of freedom, etc.). As a consequence, researchers typically select a number of different fit indices that accommodate the characteristics of their particular study, and judge overall fit on the pattern of outcomes across all of those indices. The primary characteristics of the current study were sample size, and model complexity with correspondingly

large degrees of freedom. While sample size was obvious, model complexity refers to the fact that the model test included almost 200 items representing 31 1st-order variables, six 2nd-order variables, and the 11 single-item responses making up the health and well being outcomes and worker behavior component. This meant that there was over 15,000 degrees of freedom in the model test. Taking this into consideration, six fit indices were selected. The first index was the traditional chi-square goodness of fit test – the only true statistical test of fit. In an ideal world, strong fit is reflected in a non-significant chi-square. However, the chi-square test is rarely statistically non-significant with large samples and complex models even when all of other fit indices indicate strong fit (Bollen & Long, 1993). Therefore, some have suggested calculating the chi-square to degrees-of-freedom ratio as a supplement to chi-square test. While no set standard exists as to what constitutes an appropriate (i.e. to infer fit) ratio, ratios of five have been viewed as a lower bound limit, and ratios of three or less as indicators of excellent fit (Wheaton, Muthén & Summers, 1977). In fact, a chi-square value less than 3.84 and with one degree of freedom is statistically non-significant.

The third and fourth fit indices examined the residuals (i.e. the difference between the observed covariance matrix and the one predicted on the basis of the model parameters). The standardized root mean square residual (SRMSR) is a sample-based index reflecting the average squared difference between the observed and predicted matrices. Ideally, it should be 0, but acceptable fit may inferred with values up to 0.10. Since the SRMSR doesn't adjust for model parsimony, it cannot get any better as model complexity increases, but it should also not get any worse. The fourth measure of fit was the root mean square error of approximation (RMSEA). Unlike the other indices, the RMSEA does not require a null model in its calculation and does not conflict with the requirements for parsimony (Browne & Cudeck, 1993). The RMSEA addresses how well a model would fit the population covariance matrix if it were available and with optimally chosen parameter values (Browne & Cudeck, 1993). Ideally, this index should reflect that there is no model error, but values up to 0.08 are considered acceptable errors of approximation in the population with values of 0.05 or less indicating excellent fit.

The fifth and sixth indices were the Tucker-Lewis Index (TLI) and the Relative Noncentrality Index (RNI). The TLI and RNI are not systematically related to sample size, and both reflect systematic variation in model misspecification. While good fit is inferred when values are 0.90 or greater (excellent fit is indicated by values of 0.94 or greater), it is reasonable to expect that this value could drop somewhat below 0.90 for complex models with high degrees of freedom, due to the fact that these indices heavily penalize model complexity and reward model parsimony.

Finally, it should be noted that adding tremendously to the model complexity was the inclusion of several covariates into the analysis. Specifically, variables representing individuals' ages, organizational tenure, hours worked per week, whether or not they had supervisory responsibility, education level, marital status, gender and race were included as controls. All variance due to these variables in association with all of the 1st-order variables, and the 11 single item measures constituting the worker behavior component and the health and well being outcomes was controlled for simultaneously while estimating the hypothesized paths in Fig. 4. Therefore, we could preface each of the inferences regarding the hypothesized outcomes with the statement, "all else being equal in terms of age, race, etc." Controlling for these variables was particularly important for the outcome components given that, for example, education is positively correlated with engagement in preventive behaviors, or that younger individuals have higher turnover intentions than older people. Overall, we could simply be more confident that the observed results are representing true associations between the constructs and are less likely due to extraneous sources.

Results

Turning first to overall fit of the model, the fit indices indicated strong support for the healthy work organization model in Fig. 4. While the chi-square goodness-of-fit test was statistically significant ($\chi^2 = 63077.7$, d.f. = 17994, $p < 0.0001$), the chi-square to degree of freedom ratio was quite small (3.51) and within the limits associated with strong fit. Further, both the SRMSR (0.06) and RMSEA (0.03) values were well below the maximum thresholds for inferring good fit (0.10 and 0.05, respectively). In contrast, the TLI (0.87) and RNI (0.88) were somewhat below the 0.90 standard to infer strong fit. The values for the TLI and RNI were not wholly unexpected as these indices heavily penalize complex models. However, the research literature on fit indices provides no agreed upon standards for how much of a drop in those two indices is required before observing true model misspecification (the aspect these indices are purportedly sensitive to) vs. a sensitivity of these indices to anomalous study characteristics (model complexity in this case). Given that the drop was not dramatic (perhaps less than 0.85), and that the other fit indices indicated strong model fit, we felt confident that the model fit the data quite well, and we could proceed with the interpretation of the specific findings.

Once more for the sake of conserving space, the results associated with the 1st-order measurement models are not presented here, but are available upon request from the authors. In general, however, the measurement model associating item-level data to the 1st-order constructs was strongly supported. The results for the measurement model representing the higher-order constructs are presented in Table 2.

Table 2. Measurement Model for the 2nd-Order Latent Variables.

Parameter	Estimate (Standard Error)	*t*-value
Standardized Factor Loadings of the 2nd-Order Latent to 1st-Order Latent Constructs		
Attributes to Values	0.84 (RI)	
Attributes to Beliefs	0.29 (0.02)	13.28
Attributes to Involvement Policies	0.93 (0.04)	31.48
Attributes to Balance Policies	0.83 (0.04)	29.53
Attributes to Safety Policies	0.71 (0.03)	27.82
DOS to Organizational Support	0.91 (RI)	
DOS to Coworker Support	0.62 (0.02)	27.70
DOS to Involvement with Others	0.60 (0.03)	28.63
DOS to Involvement with Supervision	0.67 (0.03)	28.29
DOS to Communication	0.83 (0.03)	33.01
DOS to Health/Safety	0.71 (0.02)	28.45
Job Design to Job Content	0.84 (RI)	
Job Design to Autonomy	0.68 (0.03)	29.65
Job Design to Work Schedule	0.62 (0.03)	26.19
Job Design to Role Clarity	0.68 (0.03)	27.74
Job Design to Workload	-0.42 (0.03)	-18.40
Job Design to Physical Demands	-0.26 (0.03)	-12.71
Job Design to Environmental Conditions	-0.55 (0.03)	-20.08
Job Future to Job Security	0.61 (RI)	
Job Future to Procedural Equity	0.76 (0.06)	22.77
Job Future to Distributive Equity	0.74 (0.07)	23.57
Job Future to Learning Opportunities	0.84 (0.06)	23.84
Job Future to Flexible Work Arrangements	0.53 (0.05)	18.94
Work Adjustment to Job Satisfaction	0.96 (RI)	
Work Adjustment to Org. Commitment	0.85 (0.02)	28.40
Work Adjustment to Self-Efficacy	0.27 (0.01)	13.54
Work Adjustment to Impact	0.56 (0.02)	27.00
Work Adjustment to Stress	–0.65 (0.02)	–32.48
Psychological Out. to Somatic Symptoms	0.66 (RI)	
Psychological Out. to Depression	0.81 (0.05)	22.73
Psychological Out. to Anger	0.81 (0.04)	22.47

Note: RI = reference indicator; DOS = domains of support; Psychological Out. = psychological outcomes; *t*-values exceeding 1.96 are statistically significant.

As evident in Table 2, all of the hypothesized associations from the higher-order constructs to each of their respective component 1st-order constructs were statistically significant and in the appropriate direction. Thus, there was clear

support for our expectation that the six sets of 1st-order dimensions have a common higher-order element that is over and above the uniqueness of each of those dimensions. Given this support meant as well that the associations from one higher-order construct to the next (and representing the substantive tests), and from them to the individual outcome measures could be meaningfully tested. These results are summarized in Tables 3 and 4. As a reminder, the results should be interpreted with a prefacing statement somewhat like, "all else being equal with respect to respondents age, education, race, marital status, hours worked, supervisory responsibility and gender."

Looking first at the top half of Table 3, clear support is indicated for the associations among the higher-order constructs. As expected, organizational

Table 3. Hypothesized Outcomes With the 1st-Order Health and Well Being Outcomes Associations Between the 2nd-Order Latent Variables and Between the 2nd-Order Work Adjustment and Psychological

Parameter	Estimate (Standard Error)	*t*-value
Standardized Path Coefficients Between the 2nd-Order Constructs		
Attributes to Domains of Support	0.92 (0.04)	31.42
Domains of Support to Job Design	0.91 (0.02)	33.89
Domains of Support to Job Future	0.97 (0.03)	23.84
Job Design to Work Adjustment	0.63 (0.06)	13.20
Job Future to Work Adjustment	0.31 (0.08)	7.56
Work Adjustment to Psychological Outcomes	–0.46 (0.01)	–17.53
Standardized Path Coefficients from Work Adjustment and Psychological Outcomes to the 1st-order Health and Well-Being Outcomes		
Work Adjustment to Alcohol Use	–0.02 (1.1)	ns
Psychological Outcomes to Alcohol Use	0.14 (2.3)	5.75
Work Adjustment to High Risk Status	0.03 (0.01)	ns
Psychological Outcomes to High Risk Status	0.16 (0.01)	7.30
Work Adjustment to Preventive Behaviors	–0.01 (0.02)	ns
Psychological Outcomes to Preventive Behaviors	–0.16 (0.05)	–5.00
Work Adjustment to Perceived Health	–0.02 (0.03)	ns
Psychological Outcomes to Perceived Health	0.01 (0.06)	ns
Work Adjustment to Perceived Work Safety	0.43 (0.02)	20.40
Psychological Outcomes to Perceived Work Safety	–0.08 (0.05)	–3.11

Note: ns = statistically non-significant; *t*-values equal to or greater than absolute values of 1.96 are statistically significant at $p < 0.05$ or lower.

Table 4. Effects of Work Adjustment, Psychological Outcomes and Health and Well Being Outcomes on Worker Behaviors.

	Predictor Variables													
	Work Adjustment		Psychological Outcomes		Alcohol Use		High Risk Status		Preventive Behaviors		Perceived Health		Perceived Safety	
Criterion Variables	Est. (se)	*t*-value	Est. (se)	*t*-value	Est. (se)	*t*-value	Est. (se)	*t*-value	Est. (se)	*t*-value	Est. (se)	*t*-value	Est. (se)	*t*-value
Turnover Intention	–0.60 (0.03)	-27.11	0.00 (0.06)	ns	0.05 (0.00)	2.70	–0.03 (0.08)	ns	–0.03 (0.02)	ns	0.01 (0.02)	ns	0.05 (0.02)	3.27
Absences	–0.05 (0.03)	–2.49	0.27 (0.06)	8.39	0.01 (0.00)	ns	–0.02 (0.08)	ns	–0.03 (0.02)	ns	0.00 (0.02)	ns	–0.01 (0.02)	ns
Lateness	–0.02 (0.02)	ns	0.24 (0.05)	7.84	0.04 (0.00)	2.51	–0.07 (0.06)	–2.19	–0.11 (0.02)	–3.63	0.03 (0.01)	ns	–0.02 (0.02)	ns
Performance	0.26 (0.03)	10.54	–0.02 (0.05)	ns	–0.01 (0.00)	ns	–0.03 (0.07)	ns	0.01 (0.02)	ns	–0.01 (0.02)	ns	–0.01 (0.02)	ns
Accidents	0.00 (0.01)	ns	0.13 (0.03)	4.78	–0.01 (0.00)	ns	0.02 (0.04)	ns	–0.01 (0.01)	ns	–0.02 (0.01)	ns	–0.11 (0.01)	–5.24
Work Limitations	–0.04 (0.02)	ns	0.18 (0.03)	6.00	–0.03 (0.00)	ns	0.02 (0.05)	ns	0.05 (0.01)	ns	–0.02 (0.01)	ns	–0.05 (0.01)	–2.81

Note: Est. (se) = standardized parameter estimates (standard error); *t*-values greater than or equal to 1.96 are statistically significant at the $p < 0.05$ level or lower.

attributes were positively associated with the domains of social support, which in turn had positive associations with both the job design and job future components. In turn, both job design and job future had positive associations with the work adjustment component. The association from the job future component to work adjustment was much weaker, though, than that for job design. Further, as expected, the negative relationship between work adjustment and psychological outcomes indicated that the stronger individuals' adjustment to the workplace, the less likely they are at psychological risk for depression, anger and somatic stress.

Turning now to the bottom half of Table 3, much clearer support was obtained for the hypothesized paths between psychological outcomes and health and well being than between work adjustment and health and well being. That is, the greater individuals' psychological risks for depression, anger and somatic stress: (a) the greater their use of alcohol (unstandardized coefficient was approximately 13 more drinks per month); (b) the higher their health risk status; (c) the less likely they are to engage in preventive behaviors; and (d) the more likely they are to perceive their well being as threatened by exposure in the workplace to safety and health hazards. In contrast, work adjustment possessed only its expected positive association with perceived exposure to safety and health hazards (i.e. the more adjusted individuals are, the safer they perceived the work environment). Given, though, the very strong association between work adjustment and psychological outcomes meant that the work adjustment component had indirect effects on the other health and well being outcomes through the psychological outcomes. Indeed, the unstandardized indirect effect from work adjustment to alcohol use was –8, meaning that work adjustment could reduce alcohol use through its influence on psychological outcomes.

Attending now to Table 4, it should be noted first that not a single worker behavior outcome was left unaccounted for by the set of predictors embodied through work adjustment, psychological outcomes, and the set of health and well being measures. Specifically, turnover intention was, as expected, negatively influenced by work adjustment, and appeared to be promoted through increasing levels of alcohol use. Similarly, while lower levels were associated with work adjustment, absences appeared to increase with increasing psychological risks for depression, anger and somatic stress. Lateness was also similarly associated with the psychological outcomes, but in addition, appeared to increase with increasing use of alcohol. Also, as expected, work adjustment had strong positive associations with individuals' perceptions as to how their supervisors rated their job performance. Finally, incidents of accidents and whether a person's work capacity was limited appeared to increase with increasing psychological risks for depression, anger and somatic stress. However, offsetting the

latter associations was the fact that accidents and work limitations decreased as individuals' perceived well being in the workplace was not threatened by safety and work hazards.

Somewhat disappointing in Tables 3 and 4 were the results around perceived health. It was neither predicted by work adjustment and psychological outcomes (Table 3) nor was predictive of any outcome in Table 4. Similarly, while high-risk status and preventive behaviors were predicted by psychological outcomes (Table 3), neither variable had a very strong presence as predictors of work behaviors. Given that the common theme in all three variables is health, perhaps the selected predictors and outcomes were not sensitive to their variability. For example, all three might be expected to predict health claims, or behaviors associated with exercise.

DISCUSSION AND CONCLUSIONS

Collectively, the results were very supportive of the healthy work organization model. The omnibus test of fit indicated that the specification of the parameters as presented in Fig. 4 were reasonable and representative of the data. Further, the results for the specification of the high-order constructs indicated that many of the variables used in tests of occupational stress frameworks, and other frameworks such as work adjustment models have a common element. Most important is the fact that the hypothesized associations among the higher-order constructs or common elements were strongly supported adding criterion-related validity to the model specification. In addition, the set of individual behaviors, which we know collectively influences organizational objective performance (Vandenberg et al., 1999), was successfully predicted through the model.

In as much as the model test represents an omnibus examination, it does not inform us, however, as to what specific variables of each of the higher-order components was driving the associations at the higher-levels. Such information may be useful, for example, if there was interest in designing targeted interventions for this specific sample. The term "specific" in the last sentence is important to recognize because it concedes that a different application of the healthy work organization model may yield similar higher-order results, but a different pattern of results when it comes to examining the associations among the specific variables. In this analysis, another model was specified, but there were no 2nd-order variables (the covariates were included). Rather, all of the paths from all of the variables in one component to all of the variables in another component were freely and simultaneously estimated. For example, there were now 30 paths representing the associations between the five organizational attribute variables and the 6 variables for domains of social support. Similarly,

66 paths were specified representing the associations between the variables for domains of social support and the 11 variables making up job design and job future. It should also be noted that the fit of this model was poorer than that obtained for the omnibus test ($\chi^2 = 68717.15$, $d.f. = 17888$; $\chi^2/d.f. = 3.86$; $SRMSR = 0.08$; $RMSEA = 0.03$; $TLI = 0.85$; $RNI = 0.86$). Further, using the Akaike information criterion to compare the two models indicates that the omnibus model utilized the information in the database (AIC = 64919.7) better than did the current model test (AIC = 70971.2). However, we contend that model fit in the current test is not entirely relevant given that strong model fit was obtained in the omnibus test, and that the goal of the current analysis was to explore what was driving the omnibus test – not to confirm a set of expected associations.

The results from these analyses are organized in Tables 5 through 10. Given that the purpose of the supplementary analyses helps sharpen and clarify the results, the following discussion will work backwards through the model starting with the outcome variables.

We will leave it to the individual reader to struggle with the specifics of the information in Tables 5 through 10. While one may perhaps weave several stories from the results, we believe the most representative one underlying the omnibus test is as follows, and as summarized in Fig. 5. Simply put, we identified those dimensions within each component that were the strongest drivers of, most frequently associated with, dimensions in the adjoining components. For example, between the two, job satisfaction and anger had associations with *all* six of the worker behavior variables (our most distal outcomes) (Table 5), job stress was significantly associated with all three psychological dimensions (Table 7), and so forth.

Further, as seen in Fig. 5, the pattern of positive and negative (+ and –) signs between the variables are completely consistent with what one would expect. For example, job satisfaction was negatively associated with turnover intentions and frequency of job-related accidents. In contrast, generalized anger was positively associated with the frequency of job-related accidents and the degree to which the individual had work limitations. Interestingly, anger also was positively associated with the per-month frequency of alcohol use which in turn promoted levels of turnover intentions and how often individuals were late for work. In addition to the direct effects of job satisfaction (negative) and anger (positive) on accidents and work limitations, both variables also had indirect effects on those outcomes through their positive (job satisfaction) and negative (anger) associations with the degree to which employees felt their well being was protected from safety and health hazards in the workplace. The latter variable, in turn was negatively associated with accidents and work limitations.

Table 5. Summary of Effects of the 1st-Order Health/Well-Being Outcomes, Psychological Outcomes and Work Adjustment Dimensions on the 1st-Order Worker Behavior Dimensions.

	Outcome Variables: Worker Behaviors					
Predictor Variables	Turnover Intentions	Absences	Lateness	Performance	Accidents	Work Limitations
Health/Well-Being Outcomes						
Alcohol Use	0.05		0.04			
High Risk Status						
Preventive Behaviors			–0.07			
Perceived Health						
Perceived Work Safety	0.04				–0.10	–0.05
Psychological Outcomes						
Depression	0.05				–0.05	
Anger		0.08	0.18		0.03	0.05
Somatic Stress		0.14			0.10	0.17
Work Adjustment						
Job Satisfaction	-0.31			0.12	-0.07	–0.10
Organizational Commitment	–0.32				0.06	0.07
Job Stress			–0.07			
Self-Efficacy at Work	0.10		–0.05	0.07		
Personal Impact on Work Group	0.05			0.12		–0.04

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

Table 6. Summary of Effects of the 1st-Order Psychological Outcomes and Work Adjustment Dimensions on the 1st-Order Health and Well Being Outcomes.

	Outcome Variables: Health and Well Being Outcomes				
Predictor Variables	Alcohol Use	High Risk Status	Preventive Behaviors	Perceived Health	Perceived Work Safety
Psychological Outcomes					
Depression	–0.05		–0.05		0.07
Anger	0.13		–0.07		–0.09
Somatic Stress		0.11			
Work Adjustment					
Job Satisfaction			–0.06		0.28
Organizational Commitment			0.10		0.05
Job Stress			–0.03		–0.11
Self-Efficacy at Work	–0.07	–0.05			
Personal Impact on Work Group	0.04		–0.05		

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

Table 7. Summary of Effects of the 1st-Order Work Adjustment Dimensions on the 1st-Order Psychological Outcomes.

	Criterion Variable		
Predictor Variables	Depression	Anger	Somatic Stress
Psychological Outcomes			
Job Satisfaction	-0.04		
Organizational Commitment			0.06
Job Stress	0.40	0.53	0.40
Self-Efficacy at Work	-0.07		-0.11
Personal Impact on Work Group			

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

Also of interest is the fact that job stress was positively associated with anger. Job stress was itself negatively influenced by individuals' feelings of job security and job content, which in turn, had positive associations with job satisfaction. The two primary positive drivers from the domains of social support for job content and job security were organizational support and the level of participation with the supervisor (Table 9). Finally, among the organizational attributes, the degree to which high involvement work policies were perceived and the amount the organization values the individual had positive associations with both organizational support and participation with the supervisor (Table 10).

Lest we become bogged down in the details of the latter findings, the goal of the chapter was to present a model of healthy work organization, and empirical data supporting (at least initially) its validity. The healthy work organization model represents an integrative perspective utilizing some of the strongest attributes from the many frameworks proposed over the decades which have used many of the same variables. However, it should be apparent at this point that the core of the healthy work organization model draws heavily from an occupational stress frame of reference. This is due to the fact that the major occupational stress frameworks, as with the current model, have as their central focus the health and well being of the individual. In doing so, they have been quite successful in linking a configuration (albeit narrow) of work environment characteristics to actual physiological and psychological indicants of individual well being – something the other core perspectives do not do. However, the occupational stress frameworks have not taken advantage of thinking and findings in these other areas to expand the frameworks.

Table 8. Summary of Effects of the 1st-Order Job Design and Job Future Dimensions on the 1st-Order Work Adjustment Dimensions.

	Outcome Variables: Work Adjustment Dimensions				
Predictor Variables	Job Satisfaction	Organizational Commitment	Job Stress	Self-Efficacy at Work	Personal Impact on Work Group
Job Design					
Autonomy		–0.05		–0.06	0.24
Role Clarity				0.12	0.10
Job Content	0.47	0.43	–0.15	0.17	0.09
Workload	–0.04		0.33		0.10
Work Schedule	0.17	0.08	–0.07		0.05
Physical Work Demands		0.07	–0.04	0.07	
Environmental Stressors	–0.07	–0.05	0.16		
Job Future					
Job Security	0.16	0.20	–0.15	0.18	0.14
Learning Opportunities	0.11	0.16		0.05	
Work Arrangements	0.09		–0.09		0.09
Procedural Equity				–0.09	0.05
Distributive Equity	0.14	0.07	–0.10	–0.09	0.06

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

Table 9. Summary of Effects of the 1st-Order Dimensions for Domains of Support With the 1st-Order Dimensions for Job Design and Job Future.

	Criterion Variables											
	Job Design Dimensions							*Job Future Dimensions*				
Predictor Variables	Autonomy/ Control	Role Clarity	Job Content	Workload	Work Schedule	Physical Work Demands	Environ-mental Stressors	Job Security	Learning Oppor-tunities	Work Arrange-ments	Procedural Equity	Distrib-utive Equity
Coworker Support	–0.06	0.07		–0.13		–0.06	–0.07	–0.05				0.06
Organizational Support	0.35	0.26	0.57	–0.15	0.33	–0.07	–0.15	0.24	0.45	0.17	0.35	0.44
Communication		0.17		–0.17	0.10		–0.11		0.19	0.20	0.29	0.16
Workplace Health		0.09	0.09		–0.04		–0.19	0.09	0.14		0.04	–0.05
Participation With Others	0.21	0.09	0.10	0.17	0.08	0.07	0.10			0.06		
Participation With Supervisor	0.25	0.12	0.13	–0.15	0.17	–0.17	–0.15	0.23	0.13	0.17	0.10	0.17

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

Table 10. Summary of Effects of the 1st-Order Organizational Attributes Dimensions on the 1st-Order Dimensions for Domains of Support.

	Criterion Variables					
Predictor Variables: Organizational Attributes	Coworker Support	Organizational Support	Communication	Workplace Health	Participation With Others	Participation With Supervisor
Involvement Policies	0.37	0.53	0.55	0.21	0.43	0.42
Quality of Work Life Policies		0.11	0.05			0.08
Safety and Health Attributes	0.08	-0.04	0.11	0.49		
Organizational Values Regarding People	0.27	0.52	0.39	0.35	0.23	0.37
Organizational Beliefs Regarding Safety and Health			-0.05	0.09		

Note: All coefficients are standardized values, and only those that were statistically significant, $p < 0.05$ or less, are reported; blank cells = not statistically significant.

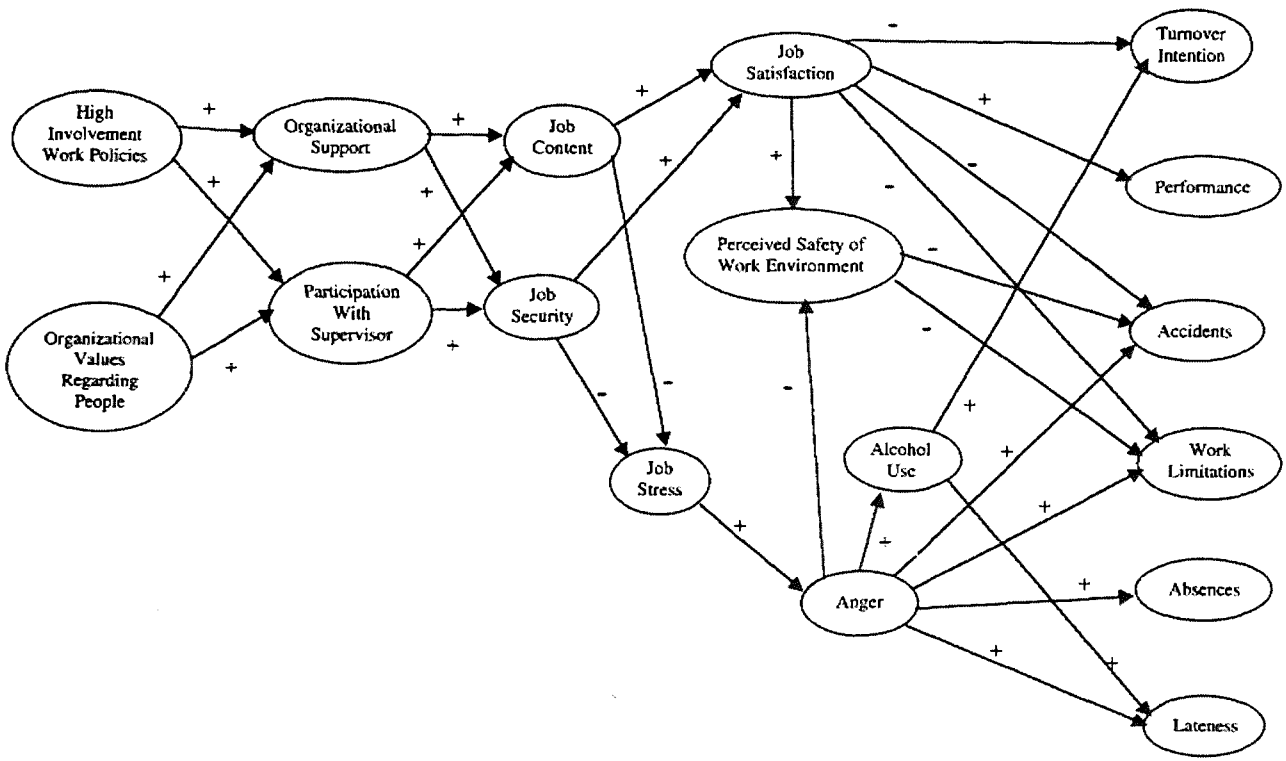

Fig. 5. A Variable Level View of the Healthy Work Organization.

The healthy work organization model is an attempt to do so. Included among the extensions is a recognition that much of what gets done in an organization, and how work is organized, is driven by the core attributes of the organization, and what support is available. These antecedent components were clearly supported in the current study. Also, supported was the fact that while researchers have variously operationalized the same components using different variables, there is a common, higher-order element among those variables that possess meaningful associations with one another. It was also shown, though, that this more omnibus view may be driven by a specific pattern of associations among the variables underlying the higher-order elements, and that this specific pattern may vary from sample-to-sample. The latter observation may also be the reason why researchers have not always obtained the same patterns of findings when using the same sets of variables in tests of occupational stress and other frameworks. Finally, the healthy work organization model was anchored to a set of individual behaviors that are commonly recognized as being ones that have an impact on objective measures of organizational effectiveness (e.g. financial performance).

The current test was not without some recognized limitations. For one, it was cross-sectional. However, we quickly point out that by including so many covariates and by conducting the tests at the higher-order level (and thereby controlling also for each individual variable), many of the concerns with cross-sectional data were probably mitigated. The second limitation was the fact that many model components have an "organizational perspective." This is particularly true for the two antecedents, organizational attributes and domains of social support. The third limitation is that we did not include any organizational-level effectiveness indices such as financial performance or turnover. Both of the latter limitations imply the need to address the model through a multilevel perspective. Data currently being collected in this project will eventually enable us to do just that. In the meantime, encouraging is the fact that as a preliminary analysis, hierarchical linear modeling supported that there is significant between unit differences on all of the variables underlying all six of the 2nd-order components in Fig. 4. Despite these limitations, the healthy work organization model was strongly supported and provides a viable framework for framing our research questions.

The concept of healthy work organization, particularly as delineated in the proposed model, has several implications for how organizations view and approach the welfare of their employees and the enterprises themselves. With leaner organizations and more aggressively competitive markets, the end effects have been to increase employee workloads, decrease workforce size, and reduce job security. These factors are just examples of occupational stress that continue

to grow and be mounting problems facing American workers in an ever-changing work environment. Taking a more proactive approach to addressing the organizational stress process would tend to require that organizations engage in some form of systematic self-analysis in order to address such work conditions and job stressors. Thus, ongoing, critical analysis is central to our working definition of healthy work organization. The proposed model requires organizations to examine their innermost workings; specifically, how work processes are structured and managed and how employees are viewed and treated in the course of day to day operations. Via this diagnostic audit, not only can work conditions and stressors be identified but organizations may use this information as a springboard to identify and determine the most appropriate interventions needed to address those issues. The healthy work organization model presented in this chapter not only represents an integrative perspective employing salient attributes from various frameworks utilized over the past few decades but also appears to be conceptually supported based on our own research findings.

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