THE RELATIONSHIP BETWEEN
ORGANIZATIONAL WORK PRACTICES
AND
EMPLOYEE PERFORMANCE:
THROUGH THE LENS OF ADULT DEVELOPMENT

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ABSTRACT

The Relationship Between Organizational Work Practices
and Employee Development
by
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This study explores the relationship between the cognitive development manifested in employee performance relative to the complexity of the work environment associated with high performance work practices (U. S. Department of Labor, 1993).   Ten shop employees in each of two manufacturing organizations, similar except for the type of work practices utilized, were interviewed regarding problem solving, roles and responsibilities, and sense of influence.   The interviews were analyzed for developmental stage of performance and stage of environment using the General Stage Scoring System (Commons, Johnstone, Straughn, Meaney, Weaver, Lichtenbaum & Krause, 1992)**.**

The organization using high performance work practices was characterized by a developmentally more complex atmosphere than the traditional organization not using those practices.   Concomitantly, the employees in the high performance organization performed at a higher developmental stage than employees in the traditional organization. Employees in the traditional organization show a modest tendency to prefer a more complex environment and are slightly less satisfied with their work environment.   The study suggests that implementation of high performance work practices may affect the development of employees through increased complexity of organizational contingencies.

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CHAPTER 1

INTRODUCTION

Many businesses in the United States are undertaking large-scale organizational change, usually in order to improve quality and reduce cost. These change strategies are driven by global competition emphasizing product or service value. Total quality management (Deming, 1986) and reengineering (Hammer & Champy, 1993) are often the featured operational change strategies and, in effect, necessitate significant change in the organizational culture.

Cultural change, from a whole systems view, affects every aspect of the organization, altering the relationships, rewards, accountabilities, norms, communication patterns, and decision-making within the organization (Jones, 1981). Schein (1990, p.117) noted that cultural change can involve "the replacement of a large number of people" because change operates at a level comparable to "individual therapy," suggesting that employee adaptation to transformed work environments is a personal and deep process. Some employees successfully adapt to the cultural change, and some do not. Somehow organizational employees must navigate the turbulence of change and learn to contribute in the new cultural context, or be replaced.

If employees do not successfully adapt to cultural changes, short-term consequences include loss of "knowledge-of-the-business" expertise in the workforce, costly to the organization, and loss of worker employability, costly to the employee. Over the long term, as more organizations reengineer and implement total quality management, the unemployability of some workers will depreciate individual quality of life and encumber society. These consequences associated with employee adaptation to organizational change emphasize the importance of understanding the mechanisms underlying employee performance relative to the work environment.

What kind of change in behavior is generally expected of employees in restructured organizational cultures? Lawler, Mohrman, and Ledford (1992) reported that many of the new behaviors are participatory in nature. The organizational development literature describes the desired contemporary employee as multiskilled, adaptable to change, independent thinking, risk-taking, willing to participate in decision-making and problem-solving, and able to reflect and act upon processes that impact quality (Kanter, 1983; Weisbord, 1989; Lawler, Mohrman, & Ledford, 1992). Such employee characteristics are advocated in total quality management and reengineering literature (Walton, 1986; Hammer & Champy, 1993).

If employees do not demonstrate the desired characteristics prior to a cultural change, what is the process that brings their work behavior into accord with the characteristics expected in the new organizational culture? What accounts for some employees adjusting to the new culture, while others do not appear to adjust (Lavoie & Culbert, 1978)?

The interactionist model of psychology acknowledges the dynamic nature of employee performance relative to a particular work environment by assuming interdependence of internal and external factors accounting for organizational behavior (Schneider, 1983). Examination of employee performance from the interactionist view requires understanding the work environment experienced by the employee, as well as characteristics of the employee. Work practices, the tactics supporting achievement of strategic management goals, represent the rewards and contingencies regarding work methods that employees experience as the work environment. Work practices change with the establishment of new management systems such as total quality or reengineering, altering the employee - work environment dynamic. Innovative contemporary work practices, such as gainsharing, have been shown to correlate with

improved organizational productivity (U. S. Department of Labor, 1993, August).   The productivity gains sought by organizations instituting new management systems is partly contingent upon employee performance, and employee performance is shaped by organizational work practices.

One way to examine employee performance is through the lens of the cognitive psychologist.   Warr and Conner (1992) acknowledged a relationship between the cognitive demands of a job and the thought processes of the employee.   If work demands in contemporary organizations are becoming more complex, then it is reasonable to assert that employee reasoning in the workplace must also become more complex.   So, it is not surprising to find a relationship between cognitive functioning in the workplace and cognitive development (Streufert & Swezey, 1986; Vogt & Murrell, 1990; Demick & Miller, 1993).   Furthermore, much of this literature supports the notion that employee cognitive development is related to the employee-work environment interaction.

Purpose of the study

This study explores the relationship between the cognitive development manifest in employee performance relative to the complexity of the work environment.   The exploration requires a methodology that allows for analysis of both the environment and the person in comparable developmental language.   The General Stage Model (Commons & Richards, 1984a) provides a suitable set of measures for linking employee cognitive development and the work environment.   This study is designed to measure the complexity of the organizational environment relative to complexity of employee reasoning in performing work   tasks in an organization using work practices associated with improved organizational productivity.   The relationship between complexity of organizational environment and complexity of reasoning during task performance is compared to the relationship found in an organization that does not use these practices.   The study contributes insights into the nature of organizational work environments and the related employee work task performance.

Summary

Chapter 1 provides an overview of this study about the relationship between employee performance and the work environment.   Understanding the nature of this relationship contributes to achieving successful employee performance and to achieving organizational improvement goals.   Chapter 2 will bring together theories and literature describing organizational work practices, employee performance, cognitive development and the research methodologies used to study their relationships.

CHAPTER 2
Understanding Employee Performance In High Performance Work
Environments From the Perspective of Cognitive Development
High Performance Work Practices

In pursuit of enhanced competitiveness, many contemporary organizations are adopting new models of participatory management   (Lawler, Mohrman, & Ledford, 1992; Oregon Economic Development Department (OEDD), 1993; Osterman,1994).   As evidence of this pursuit, Lawler, Mohrman, and Ledford's survey of the Fortune 1000 organizations revealed that, in 1990, 41% of the 313 firms responding ranked themselves as average to high users of employee involvement work practices, such as survey feedback, job enrichment, employee participation groups, and self-managed teams.   In addition, 77% of the respondents had at least some employees involved in total quality programs.   A survey of Oregon businesses found that between 3 and 17% of private employers use high performance work practices (to be described shortly).   Osterman's survey of   875 nonagricultural business locations with 50 or more employees revealed that 36.6% had at least two team or quality related work practices in place involving over 50% of employees during 1992.

Data from the Lawler, Mohrman, and Ledford study corroborates the anticipated positive association between participatory management systems, such as employee involvement or total quality, and improved organizational performance.   Between 60% and 70% of the respondents indicated that employee involvement was positively associated with improved productivity, quality, service, and worker satisfaction.   Profitability had improved for 45% of the responding firms.   Most firms pursuing total quality management reported improvement in their operating indicators.   If such supportive evidence continues to grow, organizations can be expected to move ahead in the exploration of participative management systems.   Understanding the mechanisms underlying the association between management models and organizational performance will inform this exploration.

There is no general agreement in the literature concerning the criteria that differentiate work practices from management systems for the purpose of investigation.   For Lawler, Mohrman, and Ledford, work practices that bring power, information, knowledge, and reward to the occupational employee constitute a system of employee involvement.   Total quality management work practices include employee exposure to the customer, self-inspection, work simplification, cost of quality monitoring, and collaboration with suppliers.   Work practices emphasizing rule adherence and top-down decision making make up a more traditional system of management.   For the purposes of this study, a complement of work practices aggregated in pursuit of an organizational goal, such as quality or optimum productivity, constitute a management system.   Work practices are defined as particular tactical components (e.g., work teams or compensation practices) comprising the management system.

Viewing the work practices within a management system allows us to explore the factors underlying the associated organizational performance.   In an extensive review of research concerning the relationship between work practices and organizational performance, the U. S. Department of Labor (1993, August) found that "high performance" work practices are usually associated with elevated organizational productivity.   For example, Ichniowski, Shaw, and Prennushi (1993) identified four distinct management systems within the steel industry in the United States.   System 1 employed more high performance practices than system 4 (Table 1).   Systems 2 and 3 were positioned between these poles.   Higher productivity, measured in terms of line uptime, was associated with the presence of high performance work practices.

Table 1.

Comparison of Management System Work Practices

Work Practices	System 1	System 4
Problem solving skills training	Common	Uncommon
Worker-management discussions	Frequent	Infrequent
Problem solving teams used	Often	Seldom
Job Classifications	Few	Many
Gain sharing compensation	Used	Not used
Selection procedures	Extensive	Minimal
Employment security	High	Low

(U.S. Department of Labor, 1993, August, p.7)

The practices examined in the Department of Labor study were usually associated with total quality and employee involvement management systems. Research has focused on the high performance work practices of employee involvement in decision making, performance contingent compensation, and training programs. The Department of Labor study posits that systems of high performance work practices, rather than a particular practice, appear to associate with improved organizational productivity and financial performance. This finding is consistent with Hackman and Oldham's (1980) finding that job enrichment alone does not relate to productivity results.

Productivity tends to be higher in firms using a complement of high performance work practices than in firms within the same industry that do not. Ichniowski, Shaw and Prennushi's study of the steel industry found that the magnitude of effect on productivity (line uptime) from any specific work practice depended on the presence of a systemic approach, such as System 1 (Table 1). Similarly, MacDuffie and Krafcik (1992), in their study of 62 automobile plants, found that work practices associated with flexible production have the greatest impact on reduced production time and defect rates when bundled into systems. Not surprisingly, the flexible production work practices included training, contingent compensation, work teams, and problem solving groups.

Firm productivity (Drucker, 1954) can be defined as the utilization of resources. Within this definition, employees are seen as both a primary resource and a key influence on the use of other resources. For W. Edwards Deming, a key instigator of the corporate emphasis on product and service quality, improved productivity is the direct result of less rework, fewer mistakes, fewer delays, and better use of time and materials (1986). It is reasonable to argue that improved utilization of employee resources is one of the principal explanations for improved organizational productivity when high performance management systems are instituted. How do work practices affect the individual employee, so that productivity improves? The work practice of training means that employees learn effective task team participation, problem solving skills, and knowledge of business processes (Bartel, cited in U.S. Department of Labor, August, 1993). The work practice of performance contingent compensation, such as profit-sharing, means that the employees receive an incentive for effectively achieving organizational goals. Finally, the work practice of employee involvement in decision making gives employees at least some authority over their work processes. These work practices, especially when aggregated as a system, convey something to the employees so that performance is affected.

Defining key work practices does not itself explain why employee productivity is higher in work environments using high performance practices than in work environments not using them. However,

the employee performance literature provides some information concerning the productivity aspect of the work practice-productivity relationship.

Employee Performance

Employee performance is a central theme within the study of organizational behavior. Employee behavior is thought to be a function of capacity to perform and motivation to act (Hackman, Lawler, & Porter, 1977; Mitchell & Larson, 1987). Personal variables critical to performance capacity and motive to perform have generally been classified in terms of personality variables, attitudes toward work, level of cognitive function, and level of motivation. All of these variables are construed as intrinsic to the employee.

Intrinsic variables have been examined at length in literature regarding the predictor constructs for personnel selection, especially personality traits (Schmitt, Borman, & Associates, 1993). Performance evaluation of existing employees is usually not based on such factors for legal and ethical reasons. To insure and/or maintain the performance of existing employees, setting clear and attainable goals is typically recommended (Locke & Latham, 1984). Individuals who achieve the goals are perceived as desirable employees. Goal setting is grounded in the motivational context of understanding employee performance (Locke, 1968; Bandura, 1977; Locke, 1978; Evans, 1986). Performance research commonly assumes adequate overall capability of the employee to satisfactorily perform the work task with appropriate job skill training. For existing employees, then, the accepted belief is "if you train them and give them a goal, they will perform."

Hammer and Champy (1993) and Deming agreed that high performance work environments seem to require a change in how the employee functions and that traditional training is not sufficient to effect the change. In their book concerning corporate reengineering, Hammer and Champy have emphasized that jobs in a reengineered work environment are more complex, requiring smart employees who can think independently, make their own rules, make decisions, and generally be self-directed. Hammer and Champy focused on the employee hiring process, mentioned four times in their discussion of employee capability, rather than the development of existing employees. It is implied that existing employees will develop the skills required by the reengineered environment through a process of education focused on insight and understanding of job responsibilities, rather than solely on training task skills. Employee development in the reengineering process is not thoughtfully addressed. Two of Deming's 14 points of quality management focus on building employee skills (Walton, 1986). Employees must not only be effectively trained to perform their tasks, but also educated in teamwork and quality techniques. Even with the prescribed training, the survey of Oregon businesses (OEDD, 1993) found that employers who use high performance work practices have experienced employee skill deficiencies when implementing the work practices. The question of how to assess and develop the capability of employees to perform successfully in a high performance work environment is not yet adequately addressed.

The Cognitive View of Employee Performance

Cognitive research concerning job competence provides some insight into employee capability. Warr and Conner (1992) posited a relationship between the cognitive demands of job activities and the thought processes of the employee. Job competence is defined as a "set of behaviors, knowledge, thought processes, and/or attitudes, which is likely to be reflected in job performance that reaches a defined elementary, basic, or high-performance standard" (p.99). They recognized that jobs increasingly require the processing of information, and it is necessary to attend to "required forms of cognition at work" (p.92).

Warr and Conner, along with Streufert and Swezey (1986), attempted to integrate research concerning cognitive complexity with predictive behavioral applications in the workplace. The key defining aspects of cognitive complexity include discrimination along a dimension, the number of dimensions used when thinking about something, and how information is integrated (Warr & Conner, 1992). Cognitive complexity is thought to increase with hierarchical management rank because decisions require the integration of increasingly varied and numerous situations and factors.

Research reveals that cognitive complexity is predictive of performance on applied problem solving tasks (Streufert & Swezey, 1986). For example, individuals exhibiting less cognitive complexity in problem solving took more time to solve a problem than individuals employing more. In a simulated organizational setting, subjects demonstrating more cognitive complexity applied more strategy and planning to their decision making process. Performance differences between individuals characterized as high or low in cognitive complexity become more pronounced as environmental complexity increases. High performance work environments probably have more complex demands than work environments not distinguished by high performance work practices, and it is likely that the cognitive complexity of employees accounts for some of the variation in performance adaptation to high performance work practices. For example, high performance work practices may be similar to the environmental demands Kohn and Schooler (1983) found related to adult cognitive functioning in their study of the psychological effects of work conditions. Analysis of longitudinal data from a sample of employed American men revealed that "job conditions that promote occupational self-direction (i.e., the use of initiative, thought, and independent judgment) increase men's intellectual flexibility, whereas jobs that limit occupational self-direction decrease men's intellectual flexibility" (Schooler, 1990, p. 349). Intellectual flexibility is the aspect of cognitive functioning characterized by the variety of approaches and perspectives used in approaching cognitive problems. It is logical that organizations considering high performance work practices be aware of the cognitive complexity of employees.

Streufert and Swezey have noted that cognitive complexity may be related to cognitive development as described by Jean Piaget (Flavell, 1963). However, the measurement of cognitive complexity, usually based on the number of bits of information used in completing a task, does not yield the dynamic implications of a developmental approach. If cognitive development and cognitive complexity are intertwined, then it is likely that the relationship found between cognitive complexity and employee performance will be sustained in a developmental analysis of performance.

The organizational literature concerning change and empowerment provides other clues that cognitive development is related to employee performance. For instance, Lavoie and Culbert (1978) have argued that some organizational change interventions fail because the target change is outside the reach of the current level of development, in terms of human development, present in the organization. Vogt and Murrell (1990) in their exploration of employee empowerment cited a study by Dow Chemical (pp. 58-61) that describes employee reactions to a continuum of popular participative work practices if "time and opportunity were given to work groups to move through these stages at an appropriate pace--one permitting critical issues to be resolved before moving on to the next major concern." This remark is reminiscent of the human development process described by structuralist developmental theorists, suggesting a developmental aspect to the employee behavior associated with successful participative work practices. In fact, Vogt and Murrell advocated training employees about human development during the transition to empowerment. Recently researchers interested in adult development have begun to inquire about the relationship between adult development and the workplace (Demick & Miller, 1993).

Employee Performance From the Human Development View

Development During Adulthood

Piaget's seminal study of the development of reasoning in children (Flavell, 1963) inspired the investigation of related life span development during the 1980s. Researchers began to explore the possibility that cognitive structural development continues into adulthood and beyond Piaget's formal operations (Richards & Commons, 1984; Alexander & Langer, 1990). This area of inquiry has generally been referred to as postformal development and has sprouted in various domains such as moral judgment (Kohlberg, 1984), ego development (Loevinger, 1976), ethical reasoning (Armon, 1993), and the development of faith (Fowler, 1981). In the cognitive domain, a variety of descriptions of development have emerged--for example, dialectical thinking (Basseches, 1984), relativistic postformal thought (Sinnott, 1984), and the general stage model (Commons & Richards, 1984a)--and continue to be debated (Mines & Kitchener, 1986; Alexander & Langer, 1990).

The fundamental differences between various researchers studying postformal cognitive development are related to why they believe postformal operations exist in the first place. For example, Sinnott (1989) argued for the existence of postformal operations by describing problem solving strategies that cannot be explained by formal operations. Benack & Basseches (1989) argued that postformal dialectical thinking is required to explain the emergence of relativistic epistemological structures from the dualism of pre-postformal thinking. Richards, Armon, & Commons (1984) posited that the very nature of the developmental process supports change beyond formal operations. A limit to development is not inherent in Piaget's description of developmental stages,-- sequential, qualitatively distinct structures of reasoning that emerge from, and are a transformation of, the previous stage (Miller, 1993). This study assumes, following the reasoning of Richards, Armon, and Commons, that postformal cognitive development does occur in adulthood.

Development in the Workplace

Exploration of the relationship between adult development and organizational issues has focused on the individual, the group, and the organizational environment. Research topics have included development and choice of professions, moral reasoning in the workplace, leadership-ego development, intragroup conflict, and stage of work environment (see Demick and Miller, 1993). Developmental research that offers insight into understanding employee performance, development, and work practices include Armon's (1993) examination of reasoning about *good work*, Rulon's (1993) study of the relationship between workers' moral reasoning, sociomoral complexity of jobs, and ability to resolve workplace dilemmas, and Commons, Krause, Fayer, and Meaney's (1993) investigation of the relationship between moral development and the stage of workplace environment.

Armon's examination of stages of reasoning about good work is excerpted from her broad longitudinal study that explores conceptions of what constitutes the good life. The intent of the study was to investigate the nature of life span structural development. Structural analysis examines thinking in terms of its organization and changes in the pattern of that organization. Evaluative reasoning about the domains of the good life, good work, good friend, and good person was assessed over a period of 12 years. Armon identified five stages of reasoning in her analysis of good work and argued that hierarchical development of reasoning about good work does occur for adults over time. The study also suggested a positive relationship between general work role complexity and stage of reasoning about good work.

Rulon, in an experimental design, found developmental interventions in the sociomoral domain to stimulate moral development in health care professionals, creating a better match with job complexity. Planned discussions of sociomoral dilemmas served as the intervention strategy. Analysis of pretest to posttest results of Kohlberg's moral judgment interview provided evidence of developmental change.

Rulon also found an increase in action-taking to resolve workplace dilemmas after the intervention, a finding related to performance.

Commons, Krause, Fayer and Meaney (1993) explored the relationship between moral development in the workplace and workplace "atmosphere." Atmosphere is created by the dynamic between the organization and the persons employed in the organization, including the contingencies affecting employee behavior and how the contingencies are set. The authors found evidence suggesting that atmosphere can influence individual moral development through the activities it reinforces. For example, a university "threatening those who don't [support the university's goals] in some official way" is described by a student subject as "[making] us not critics, but ralliers, followers, enthusiasts" (p. 209). Rallying around organizational goals is classified at a hierarchically lower developmental stage than, for example, the integration of individual and organizational goals that might be encouraged in an environment accepting of criticism and change.

All of the above studies strongly suggest a relationship between the development of reasoning in the moral domain and the work environment, with the environment represented as work role (Armon), intervention (Rulon), or atmosphere (Commons, Krause, Fayer & Meaney). In fact, the interaction between the person and environment plays a pivotal role the study of human development, interactionist psychology, and organizational behavior.

Environment and employee performance

The interactionist model of psychology assumes interdependence of internal and external factors accounting for organizational behavior. From this view, employee behavior is not the result of purely situational variables, as behavioral motivation programs would lead one to believe. Nor is employee behavior the result of only intrinsic variables, such as leadership trait theory implies. Interactionists, like Schneider (1983), have viewed the personality and the situation as inseparable. Schneider argued that organizational behavior research following a strict trait approach (Weiss & Adler, 1984) or a purely situational perspective (Salancik & Pfeffer, 1977) provides only partial evidence about the topic of study and cannot be generalized because one-way causal inferences do not adequately represent the dynamic between work environment and employee. Employee performance is thought to be a function of the employee's active construction of the situation through perceptual processes and experience. Both personal and environmental factors must be considered. From this perspective, it is possible for an environmental intervention, such as change in work practices, to result in employee performance outcomes of varying directions and strength, depending upon employee attributes, such as cognitive complexity. In turn, the characteristics of work practices may be modified over time in response to employee behavioral response.

Organizational behavior literature from researchers conversant with theories of cognition provides evidence for the person-environment developmental interaction. For example, Kohn and Schooler's (1983) 25-year study of the effects of job conditions on employed men demonstrated that, at least for men, increased job complexity was associated with improved cognitive ability in terms of problem solving, while limiting jobs were linked with lessened ability. Driver (1987, p.71) referred to the influence of environment on cognitive development in positing that "long-term exposure to an environment of different complexity could shift a person from one [complexity of information use relative to environmental load] curve to another." For example, if a person's job expands to include more complex, multidimensional tasks, the person could, over time, become a more effective and efficient information-processor. Streufert and Swezey (1986, p.57) believed that "given that a ... potential exists, complexity can develop in a person if he/she is frequently presented with clear and directed evidence about the existence of multiple dimensions."

The contemporary interpretation of Piaget's theory of cognitive development takes an interactionist view, arguing that psychological processes are influenced by both innate and experiential factors (Miller, 1993).   Cognitive adaptation is said to occur through the processes of assimilation and accommodation, terms that directly reflect interaction between the person and the environment.   Employee experience can either fit into, thus reinforcing, the existing cognitive structure (assimilation), or serve to stimulate a qualitative adjustment to that structure (accommodation).   Accommodation occurs through the mechanism of action in the environment.   The environment provides the frame within which a person acts *and* the action is the operator by which the person changes the environment (McGuinness, Pribram, & Pirnazar,1990).

Following this conceptualization, the general stage model (GSM) describes the mechanisms of interaction between the environment and stage of cognition.   Cognitive development occurs when environmental cues are detected that challenge the old way of thinking, forcing experimentation with new, more complex, ways (Commons, Grotzer, & Davidson, 1991).   The cues are related to environmental contingencies: what behavior is reinforced and what behavior is not.   If the environment suddenly ceases to reinforce behaviors related to particular ways of reasoning, a person will tend to experiment with alternative ways of reasoning.   Experimentation increases the probability that some behavior will eventually be   reinforced.   The relationship is interactive in that persons influence the environment by how they behave in it.   Organizational transition to participative work practices changes the patterns of reinforcement in the workplace.   During a work practice transition, it is expected that employees will experiment with new performance behaviors, ultimately organizing behavior according to the new reinforcement patterns in the work environment.

Clearly, the   person and environment engage in an interdependent interaction.   This means that each variable can be measured independently, but the effects may only be understood in relation to each other. Employee performance can be understood only relative to the work situation in which the behavior occurs.   The persistent problem for interaction research, including this study, is the development of methods capable of examining the presence and level of personal and situational variables in behavior (Chatman, 1989).

Cognitive researchers Kohn and Schooler (1983) addressed the influence of organizational environment on cognition by rating interview answers regarding closeness of supervision, the substance of the work (data, things, people), and the structural complexity of the work task.   Cognitive effort is tied to environmental complexity, the environment's stimulus characteristic, and the reinforcement available for cognitive effort.   Studies by Streufert and Swezey (1986) measure task load   (e.g., quantity of information per time period) to represent environmental complexity that determines use of cognitive potential in task performance.   In contrast with the cognitive tradition, developmental research relates task environment to Kohlberg's (1985) "moral atmosphere."   For example, Higgins and Gordon (1985), in their study of work climate   and socio-moral development in worker- owned companies, posited that work related norms can be assigned moral stage depicting work environment when "most members offer a commonly understood and shared reason" for the norms (p. 250).   Commons et al. (1993), building on Kohlberg,   posited that environmental influence on behavior can be described "in terms of   contingent relations among events" that, coupled with their justifications, can be assigned a developmental stage of reasoning according to the GSM.   The authors called the relationship between employee behavior and contingent consequences in the work environment ***institutional atmosphere.***   Atmosphere can either constrain or motivate the development of the individual or the organization.

Cognitive and developmental theorists have agreed that work environments characterized by high performance work practices consist of a different set of performance expectations than environments not

using such practices.   The choice of environmental measure, cognitive or developmental, depends upon how work task demands are most usefully defined in terms of valid representation of the environmental elements influencing behavior and constructs supporting the analysis of the person-environment relationship.   The Commons et al. (1993) method of assessing institutional atmosphere is intended to characterize the person-environment relationship and is not domain specific.   High performance task demands may require not only more complex information processing skills, but more complex reasoning in a variety of domains.   For example, Rulon (1993) has argued that the quality and quantity of perspective-taking, complexity of conflicts, level of responsibility, and participation define the socio-moral complexity of a job.   Adult development theory offers a powerful way to understand the interactive relationship between the work environment and employee performance.

The GSM (Commons & Richards, 1984a) provides a means of exploring the relationship between work environment, defined by work practices, and cognitive development across domains.   I turn to the general stage model (GSM)   of development to link the work environment, employee task performance, and employee cognitive development.

The General Stage Model

The GSM posits that stage of development can be measured in terms of the organization of a person's response to a task.   It is an analytic tool applicable to any developmental domain and predicts development beyond Piaget's formal operations.   The GSM is founded in behavior-analytic theory.

The GSM defines a developmental stage according to the hierarchy of measurable tasks that a person within a stage can successfully do (Commons, Trudeau, Stein, Richards, & Krause, 1994), rather than in Piagetian terms of what cognitive structures are implied in task success (Kohlberg & Armon, 1984).   In other words, a researcher using the GSM to understand performance on a task would first analyze the task to determine the complexity of task demand, representative of stage.   Individual task performance would then be observed, permitting inferences about the individual's complexity of performance relative to task demand.   If this assessment occurs over the full range of hierarchically ordered tasks, the highest stage of task successfully performed is said to represent the stage of individual functioning.   Hierarchy is represented by the number of times the output of one level becomes input at the next level--the hierarchical complexity of reasoning.

Commons et al. (1994) maintained that many domain specific models of postformal development, such as Loevinger's ego development, represent *soft* stages, conditioned by particular experiences.   The GSM, following the *hard* definition of stage, subscribes to the rules of universal sequential development and describes the structure of tasks *in any domain* that a person at a particular stage can do (Commons & Richards, 1984b).   It is possible that employee performance is linked with development in several experiential domains, including logical reasoning, socio-moral reasoning, and ethical reasoning.   The GSM provides a means to explore employee performance without preliminary limiting of assumptions concerning what domains may be salient.

Analysis of a completed task provides definitive evidence for stage. This task analysis focuses on how the task is understood and conducted when successfully performed.   The greater the number of recursions of "coordinating actions on a set of primary elements" evidenced in a person's response to task, the higher the stage of development (Commons, Krause, Fayer, & Meaney, 1993, p.202).   For example, employees considered successful in a traditional organization might focus on the completion of only their own workload.   In a high performance organization, successful employees   probably balance their workload along with the work inputs of the entire office or team.   The latter work task is hierarchically

more complex since it integrates the situation where the employees focus only on completion of their individual work.

The output of one stage, representing one level of coordination of elements, becomes the input for the next level of coordination and produces a new order that could not occur within the preceding stage. Hierarchical complexity thus becomes the basis for stage definition.   The GSM posits that stage can only be assessed through analysis of performance on tasks (Commons, Trudeau, Stein, Richards, & Krause, 1994).   For this study,   the term *stage of performance* represents the stage of cognition associated with successful task performance.

The GSM appends the postformal stages of systematic, metasystematic, paradigmatic, and metaparadigmatic operations to the traditional Piagetian stages of development.   A study of 110 undergraduate and graduate students' reasoning on problems of comparison and contrast between four stories representing systems of relations (Richards & Commons,1984) shows that task-performance, scored according to the GSM, occurs in discrete and sequential stages from concrete through metasystematic as expected by the model.   Table 2 describes and exemplifies the GSM stages.

Table 2.
Description of GSM Stages of Adult Development

Stage Name	Description	Example
Concrete (3b)	Detect sets of elements based on a special property. No generalization outside of situation.	Something(one) is good if specific outcome is good. Elements are specific, thus not generalizable.
Abstract (4a)	Detect variables. Can use abstract concepts, but not reason about them.	Something(one) is good if meet set of criteria describing goodness.
	Rules applied across variables, but rules can't contain variables.	Stereotyping.
Formal (4b)	Detect relations between variables. Can use logic chains and reason about abstractions.	Statements of causality. If *x*, then *y*. Rules more important than situation.
	Relations applied to single and combinations of variables. Entire system not recognized.	
Systematic (5a)	Detect systems. System examined as	Individual is important in relation to fit in system.

whole. Intrasystemic.   Personal perspective

Coordinate (4b) variables defines system.
into an input.   Awareness of context.
                             Organization is a system.

Meta-   Detect relations   Taking others
systematic   between systems   perspective. Self
  (5b)   Intersystemic.   and system.   Able to
        Coordinate (5a).   compare systems.

*(Adapted from Commons, Richards, & Armon, 1984; Commons, Johnstone, Straughn, Meaney, Weaver, Lichtenbaum, & Krause, 1992;   Commons, Trudeau, Stein, Richards, & Krause, 1994)

Commons, et al. (1993) contended that three stages predominate adult development: formal, systematic, and metasystematic.   Studies of undergraduate and graduate students (Richards & Commons, 1984) and of non-literate Mexican adults (Commons, Galaz-Fontes, & Hernandez-Morelos, 1992) have demonstrated most adult reasoning can be scored in the range from concrete through systematic operations.   Also, Neimark (in Commons, Grotzer, & Davidson, 1991) found many adults testing below formal operations.   Because this study examines performance of occupational employees with high school and perhaps some college education and from a variety of experiential backgrounds, the stage distribution is expected to range from concrete operations through systematic operations.

Further, the modal stage of employee performance is expected to be higher in work environments with established high performance work practices than in work environments without the high performance practices.   This hypothesis is based on the role of the environment in Commons' analysis of how behavioral development occurs, described below.

Commons, Grotzer, and Davidson's (1991) model of stage transition is based on the Piagetian model of cognitive equilibrium and learning theory. When one's current behavior does not produce the expected results, disequilibrium occurs, a prerequisite for stage change.   In behavioral terms, patterns of environmental reinforcement extinguish lower stage responses that have been successful in the past, increasing overall variability of response.   This step constitutes the *deconstruction* of performance at a particular stage.

Construction of performance at the succeeding stage, described from Commons' behavioral viewpoint, begins when an incentive (operant reinforcer) to detect an event representing the next stage of hierarchical reasoning is present.   Such an incentive might be successful performance of a task at the next stage of hierarchical reasoning.   The incentive, that may become important for either intrinsic or extrinsic reasons, increases the likelihood that the event representing the next stage is detected.   The detection must be strong enough to influence behavior at the new stage (the operant response) that may be reinforced.   Reinforcement of successful behaviors results in the establishment of a new level of organizing responses, a stage change.

Commons, Grotzer, & Davidson (1991) provide empirical support for the constructive influence of environment, represented by reinforcement, on cognitive development in their study of young students learning to solve formal operational problems.   Three groups of students were presented with problems requiring them to detect causes.   Each group received either no feedback, feedback, or feedback and reinforcement, pertaining to their performance.   Results support the idea that reinforcement of formal

operational reasoning with concrete (3b) and abstract (4a) operational subjects induces the development of formal operations. The study found formal operations to generalize and transfer over tasks.

Because of the incremental nature of development, the GSM predicts a low probability for the occurrence of successful task performance in a situation reinforcing behavior based on reasoning more than one stage of complexity beyond a person's current stage of development. If the situation reinforces behavior at a level below the person's stage of reasoning in other domains or below potential stage of reasoning, stage of performance is likely to be constrained to the stage reinforced in the environment (Commons, Krause, Fayer, & Meaney, 1993).

If the stage reinforced in the high performance environment is more complex than in the traditional environment, then employee performance will tend to be more complex. The reinforcements, or contingencies, in the environment, along with how the contingencies are set, constitute the organization atmosphere (Commons et al., 1993). Organizational atmosphere can be classified by GSM stage of development. Systems of work practices help to shape the patterns of contingencies characterizing organizational atmosphere. The fundamental work task remains similar, but how employees are expected to go about accomplishing the task is more complex in the high performance organization. Table 3 depicts the GSM stage of task demand complexity that is likely for each work practice associated with organizational performance.

Table 3.

Comparison of Work Practice Systems by GSM Stage of Task Demand

Work Practices	System 1	Stage	System 4	Stage
Problem solving skills training	Common	4b+	Uncommon	3b/4a
Worker-management discussions	Frequent	5a	Infrequent	3b/4a
Problem solving teams used	Often	4b+	Seldom	3b/4a
Job Classifications	Few	5a/5b	Many	3b/4a
Gain sharing compensation	Used	5a	Not used	4a
Selection procedures	Extensive	na	Minimal	na
Employment security	High	na	Low	na

(Adaptation of data from U.S. Department of Labor, 1993, p.7)

The figures in Table 3 were generated by assessing the probable impact of each work practice on work task complexity. The task complexity associated with each work practice was then evaluated according to the GSM and an appropriate stage assigned. This process is outlined below

Problem solving training and team participation require at least the cause- and-effect reasoning of stage 4b (please refer to Table 2). If an employee does not participate in problem solving, stage 3b/4a reasoning based on outcomes or some set of externally established criteria is probably reinforced.

Substantial worker-management discussion calls for the employee to function at least at a systematic, stage 5a, understanding of their relationship to the organizational system. This means they can reason about whole workgroup performance rather than just the variables influencing performance results. Again, few management-employee discussions implies rule-following and externally generated performance criteria.

Few job classifications implies multi-functional job responsibilities. Making appropriate work task choices depends upon the employees understanding their role relative to the organization, if not the merging of self and organization that occurs in metasystematic reasoning (stage 5b). Many job classifications imply task simplification. The employee is focused on a limited number of variables and, therefore, probably not reasoning above stage 4a. Gain sharing reinforces reasoning about employee behavior relative to the performance of the whole organization, stage 5a. Stage 4b reasoning is not sufficient because the simple additive effects of performance over several variables may not result in a successful organization (e.g., if each employee performs designated work tasks successfully, the entire group will be successful). Successful organizational performance requires the coordination of all task performance information into a whole that is situationally responsive. No gain sharing means that employee performance evaluation is based on a set of criteria isolated from other variables. Finally, selection criteria and employment security do not directly influence task demand and their influence on task is probably highly dependent on the status of the other work practices.

Overall, this analysis suggests that the atmosphere of organizations using high performance work practices presents task demands classified at stages 4b/5a, and organizations not using these practices are characterized by task demands no higher than stage 4a. The second hypothesis is, then, that the atmosphere is hierarchically more complex in organizations using high performance work practices than in organizations that do not.

It is likely that when a particular complexity of reasoning is achieved in one domain, such as in family life or community involvement, the probability of its occurrence in other domains will increase. Kegan (1994) presented a convincing argument that the demands of modern life are at an order of complexity equivalent to GSM stage 5a. If his argument is accurate, then individuals successfully meeting life task demands tend to perform at stage 5a, thus increasing the probability of stage 5a behavior in all domains. Increased occurrences of behaviors that are more complex than those reinforced in an environment may serve to stimulate the environment toward more complex contingencies. If task demands are less complex in organizations using traditional work practices than in other life domains, tension toward increasingly complex work practices will tend to be present in the traditional organization because employees are probably capable of reasoning at higher stages in non-work situations. Complexity of work tasks in organizations using high performance work practices will tend to match those in other life domains. This leads to the third hypothesis that employees in the traditional organization will tend to express a preference for more changes in work practices than employees in high performance organizations. The employees in the traditional organization may also be less satisfied with their work environment.

The GSM is chosen as the vehicle through which to study the relationship between organizational work practices and employee stage of cognitive development primarily because the complexity of the task is distinguished from the individual's stage of task performance. Additional reasons include: 1) Stage of cognitive development is understood as an *ability* to perform tasks present in the environment, rather than a particular trait (Richards & Commons, 1984). Task performance is analogous to employee performance capability in the work environment. 2) The GSM explicitly acknowledges the role of environment in understanding human performance through the construct of organizational atmosphere. The environment is interpreted in terms of the stage of cognitive development required for successful interaction with it. Work practices serve to shape the organizational atmosphere and can be classified by stage of cognitive development. 3) The GSM applies across domains. Therefore, the examination of employee task performance need not be prematurely limited to particular domains thought to influence performance. 4) The influence of employee development on the work environment is acknowledged. Employee stage of performance may influence the effectiveness of work practices in terms of the level of performance that is immediately attainable.

Summary and Statement of Problem

In this chapter, it was argued that exploring employee performance and organizational work practices from the perspective of cognitive development will reveal useful insights concerning their relationship. Of specific interest is the stage of reasoning requisite in work environments characterized by the presence or absence of high performance work practices.   Most organizational literature defines employee performance as contingent upon employee capability and motivation to perform relative to performance standards, and focuses on motivational aspects of employee performance.   With the advance of high performance work practices, I believe employee capability is an increasingly important determinant of employee performance.   Capability appears to be related to stage of employee cognitive development. Employee performance depends, in part, upon the relationship between the stage of employee cognition and the complexity inherent in the work practices.

The GSM offers a way to assess both organizational work practices and employee performance from the standpoint of stage of cognitive development.   The theoretical underpinnings of the GSM lead to the following hypotheses concerning the interaction between work practices and employee performance.

(1)   The work environments, institutional atmosphere, in organizations using high performance work practices are hierarchically more complex than the environments in organizations not using high performance work practices.

(2)   The stage of employee performance, thought to represent cognitive stage, in organizations using high performance work practices will be higher than the stage of employee performance in organizations not using high performance work practices.

(3)   Employees in organizations not using high performance work practices will be more likely to express preferences for an increase in the hierarchical complexity of   organizational atmosphere than employees in organizations using high performance work practices.

Chapter 3 presents the research methodology used to explore the relationship between organizational work practices and employee cognitive development.

CHAPTER 3

Research Design and Methodology
Introduction

The research design is a comparative study of two organizations, similar except for the type of work practices utilized. The variables of interest are stage of work environment and stage of employee work task performance. The selection of participant organizations and employees is initially discussed. Next, the selection of assessment tactics and scoring technique are explained. Finally, the study procedure is described in detail.

Participant Selection

Participant Organizations

Participant organizations were selected based on their utilization of high performance work practices. Table 4 summarizes the selection criteria based on the work practices most commonly the focus of work practice--organizational productivity research (U. S. Department of Labor, 1993, August). If an association is found between these work practices and stage of atmosphere and employee performance, then the notion that higher stage employee performance contributes to organizational productivity is supported.

Table 4.

***Participant Organization Selection Criteria**

*

Work Practice	Organization Using High Performance Practices	Organization not Using High Performance Practices	Assessment
*Training	Team Skills Problem Solving Business Processes	Initial Job Training	Training curriculum and how training is initiated
*Compensation	Wages and form of profit-sharing	Wages	Policy
*Employee Involvement in Decision-making	Employee groups have authority to make decisions concerning work issues	Suggestion plans or no involvement	# of teams in place and level of authority per documentation (Employee input or recommendation is Intermediate stage)

*

*

The high performance organization informs occupational employees of business issues and trains task team membership skills and   problem-solving models.   Employee participation in groups that have substantive decision making authority at the work group level is usual and a portion of employee compensation is contingent upon work group or organizational performance results.   The traditional organization limits training to initial job training and task-related updates.   Wages comprise the formal compensation package.   Finally, employee input regarding the work task is, at most, consultative, confined to suggestion box style feedback.

The high performance organization was identified through professional contacts.   The traditional organization was selected   based on equivalence to the high performance organization in terms of industry type, work location size, sophistication of technology use, and geographic location.

Participant Employees

Ten participants in the high performance organization were solicited by written invitation through the team leaders.   Participants were solicited across all teams to minimize impact on organizational production processes.   Participation was voluntary and contingent upon satisfactory performance and employment of 3 years or more. It is assumed that task skills and patterns of interaction with the work environment have been established within 3 years.   Each team agreed upon the team member(s) to be interviewed.

Ten participants in the traditional organization were solicited by written invitation through the Manufacturing Manager/Personnel.   Participants were solicited across all groups to minimize impact on production.   Participation was voluntary and contingent upon satisfactory performance and employment of a year or more.   Because of high employee turnover,   the 3 year employment criterion was not feasible.   The Manufacturing Manager/ Personnel and researcher selected participants from among volunteers in each group based on maximizing sample tenure.

<div align="center">Date Collection and Measures</div>

Data were collected from the analysis of job descriptions, organization structure charts, and from a semi-structured 1-hour interview with 10 non-management employees from each organization. Additionally, each participant rated her/his satisfaction with the work environment and sense of job security on a 5-point scale, ranging from *extremely dissatisfied* to *extremely satisfied*.

The Interview

Interview questions (Table 5) elicited statements describing work task performance, the employee's perception of   the organization's expectations concerning performance, and preferred work task in terms of problem solving, roles and responsibilities, and influence in the workplace.   The interview questions are designed to reveal the stage of work task performance, organizational atmosphere, and the ideal work task for each participant.

Table 5.
Interview Logic

PARTICIPATIVE ELEMENTS

QUESTION SEGMENTS	**Decision-making & problem-solving**	**Employee-manager roles & responsibilities**	**Personal Influence**
Task Performance	Examples of problems or issues you deal with in this workgroup; how handle & why	What is your role and the mgr role? What issues belong to each? Why thing that?	What influence do you think you have in the workgroup? Why think that?
Task performance supported by work environment	How do you think the organization wants you to handle this matter? Evidence and why this way.	What breakdown of roles and responsibilities do you think the organization wants? Evidence and why this way.	What influence do you think the organization wants you to have? Evidence and why this way.
Preferred performance and work environment	What would be a more effective approach to dealing with the issue? What keeps that from happening now? Probe: "perfect work environment."	What do you think is the most effective arrangement of roles & responsibilities? What keeps that from happening now? Probe: positive assertions Perfect work environment.	How much influence would you like to have? What keeps that from happening now? Probe: positive assertions "perfect work environment."

Analysis of Work Environment

Hierarchical complexity of the work environment can be inferred from the performance behavior reinforced in the organizational environment. Two types of contingencies are examined to understand what performance behaviors are reinforced. The first, explicit task demands, are expressed contingencies linking behavior with the task. Job descriptions were examined for task components and performance expectations, providing information reflecting the *explicit* task demands. Explicit task demands, however, do not address the universe of contingencies perceived by the employee, the *implicit* task demands.

Implicit task demands were extracted from interview statements (Table 5) about the employee's perception of the organization's expectations concerning performance. Participants were probed for justifications regarding their conclusions and why the organization came to be the way it is. Probing for

justification is used to elicit underlying reasoning (Kohlberg, 1985; Colby & Kohlberg, 1987), in this case concerning why the organization operates in a particular way. According to Weick (1987), individuals construct justifications to explain actions and what will happen if the actions occur again. Justifications, then, reveal environmental contingencies.

Participant statements regarding the organizational work environment were assessed, using the General Stage Scoring System (GSSS) (Commons, Johnstone, Straughn, Meaney, Weaver, Lichtenbaum & Krause, 1992), for stage of hierarchical complexity. Types of statements (with paraphrased examples) categorized as atmosphere, rather than task performance, included:

1. Justification for organizational behavior, including particular work practices. "The organization will fire anyone disrespectful of customers because a satisfied customer will do business with us again." Contrast with task performance statement of "I treat customers with respect because I'll get fired if I don't."

2. How organization would behave relative to a particular stimulus. "If a part is out of spec, then the organization will send someone to sort the bad parts from a delivery."

3. Team leader and owner behavior. "Our team leader will make overtime mandatory if we don't handle the production process."

4. A contingency described in general terms, not a particular case of task Performance by an employee. "If the leader sits in a separate area, then the team is expected to be accountable for production." Task performance would be, "I took steps to ensure we met production goals because the leader was not on the floor."

Employee Task Performance

Statements describing employee work task performance were assessed, using the GSSS, for stage of reasoning used. Participants were asked to describe their usual approach to a typical situation demanding problem solving and decision making, their understanding of manager-employee roles and responsibilities, and their perceived influence in the workplace (Table 5). Probing questions took the form of "why did you choose to handle the situation that way?" and "why do you think that?"

Preferred Work Atmosphere

Finally, each participant was asked to describe the most effective or ideal approach to problem solving, manager-employee roles, and personal influence. Probes delineating the improvements associated with the ideal draw out statements reflecting the preferred organizational atmosphere.

The interview, conducted by the researcher, was audiotaped. The transcribed interview was scored using the General Stage Scoring System described below.

The General Stage Scoring System

The General Stage Scoring System (Commons, Johnstone, Straughn, Meaney, Weaver, Lichtenbaum & Krause, 1992) is derived from the GSM. In contrast with standard issue scoring systems, such as Colby and Kohlberg (1987), the GSSS focuses on analysis of the complexity of statements rather than their content. For example, if an employee states that a particular work activity is performed because the

team benefits, the logical construction of "if I perform this activity, then the team benefits" determines stage, rather than whether the idea of benefitting the team implies a particular developmental stage.

Because the application of the GSSS is not limited to a particular domain, work task performance can be examined regardless of the domain of justification for a task activity. Commons and Grotzer (1990) found GSSS stage scores of responses are usually equivalent to those obtained through other scoring procedures, including Armon (1984), Colby & Kohlberg (1987), and Perry (1981), substantiating construct validity.

Applying the GSSS. The GSSS measures stage of performance according to the highest-order task that is performed adequately and consistently. Stage of performance indicates the most complex discrimination the participant regularly makes on a task in a particular stimulus situation (Commons, 1994).

To determine the highest-order task performed, interview content is divided into individual statements about an issue. A statement is scoreable if it consists of an assertion. Assertions can be positive, affirming the presence of particular events, or negative, claiming that particular events are not present. Interview questions are constructed to elicit both positive and negative assertion types to facilitate scoring.

Scoring is based upon choice theory and signal detection theory, analyzing "how individuals construct a choice from complex sensory information" (Commons, Johnston, Straughn, Meaney, Weaver, Lichtenbaum, & Krause, 1992, p. 6). Positive and negative assertions are compared with the ideal logical performance described by the GSM for each stage scored. The scoring method is similar to the scoring scheme used by Lam (1994) and illustrated by Commons, Sonnert, and Lam (1995). Scorer judgment has demonstrated a reliability coefficient of .95 (Commons, 1994). Positive assertions are considered "hits" if they match logic representative of a given stage and "misses" if they do not. Negative assertions are classed as "correct rejections" if they include logic typical of a particular stage and "false alarms" if not. Appendix A provides a detailed example of the scoring methodology.

All scoreable statements categorized as task performance, work atmosphere, or preferred atmosphere were scored and aggregated by category. In order to assign a stage of performance for each category, the most complex discrimination the participant *regularly* makes on a task is operationalized as the highest stage of response employed in 20% or more of the statements in that category unless the stage of response is employed once. Total hits and correct rejections for a stage are corrected for miss and false alarm responses at that stage. These criteria were chosen because the highest stage of response a participant regularly makes usually falls between a lower stage that inherently tends to occur more frequently than higher stages and the highest stage used that may occur by chance.

Data Analysis

Scoring yields a distribution of stage assignments over each interview category for each organization. Because the small sample size of 10 in each group and because the stage scores do not lend themselves to the assumption of normal distribution, directionality of results was extracted through the application of several statistical techniques. Stage score distributions for task performance, work atmosphere, and preferred atmosphere were compared between organizations using the one-tailed Fisher's exact test , the chi-square, one-way analysis of variance (ANOVA), and calculation of the ϕ, λ, and Cramer's v coefficients. The chi-square tests the hypothesis that there is no association between distributions. The small sample size results in a questionable approximation of the actual probabilities . The Fisher's exact test overcomes the problem of small cell frequency found in calculating the chi-square statistic. This

statistic tests the hypothesis that the cell arrangement is the result of chance. The Fisher's exact test assumption of fixed table marginals seems appropriate, but stage difference information is lost because stages are collapsed to achieve the two-by-two contingency table. Finally, the one-way ANOVA tests the idea that both organizations are characterized by the same average stage of performance. The ANOVA requires that the samples be from a normal population with equal variance. These assumptions may not be met, but the ANOVA provides a quantitative analysis of the study results. All statistics showing similar results provide certainty that the results are robust. Pearson's r is used to examine the relationship of stage classification with age.

Along with analysis of job descriptions, the modal stage of work environment extracted from each organization's employee interviews represents the work atmosphere characterizing that organization. The modal stage, rather than highest stage (Commons et al., 1993), is thought to represent the work atmosphere, in agreement with Higgins and Gordon's (1985) conception of work environment as generally accepted norms and because one instance of higher stage reasoning may reflect a set of contingencies particular to the individual, such as preparation for promotion.

Procedure

Several organizations reporting high performance work practices were identified from recent business literature, personal contacts, and the Oregon Quality Initiative. After initial telephone contact, a letter introducing the study (Appendix B) was sent to the leading high performance organization candidate. Upon its agreement to participate, work practices in use were validated through an in-person interview with a human resources manager, non-management and supervisory job descriptions were obtained, organizational vision and mission statements gathered, history of organizational performance collected, and process of soliciting volunteers and scheduling interviews negotiated.

Organizations comparable to the high performance participant, in terms of industry, size, and use of technology, were identified through business indices and networking. The work practices used by these organizations were investigated through telephone calls, and organizations appearing to use a traditional approach were solicited for participation. A letter introducing the study (Appendix C) was sent to the organization candidate expressing interest in the study. Upon their agreement to participate, work practices in use were validated through an in-person interview with a human resources manager, and data gathered as previously described.

Once the candidate organizations were selected, a memo introducing the study and asking for volunteer participants was distributed to all employees in the target workgroups (Appendix D and E). One or two volunteers meeting the selection criteria were solicited per work team in the high performance organization, or functional group in the traditional one. Volunteers in the high performance organization totaled 10. Ten volunteers in the traditional organization were selected based on balanced functional group representation and to maximize years of experience in the organization. The interviews were scheduled through administrative support personnel in the high performance organization and through the Manufacturing Manager/Personnel Manager in the traditional organization and were conducted in on-site conference facilities. Participant questions were answered and the consent form reviewed (Appendix F) prior to the interview. When the participant confirmed agreement to participate, the interview (Table 5) was conducted. The researcher audiotaped the interview. Interview transcriptions were scored by the researcher and a random sample validated by an independent scorer. Scorer reliability was assessed. Chapter 4 describes the participants and examines the data extracted by the study procedure.

CHAPTER 4

Results
The Participants

Participant Organizations

The high performance organization (HPO) of approximately 525 employees manufactures 4-wheel drive hubs, winches, and bed liners. It is privately held, with annual sales exceeding $100 million and annual revenue growth ranging from 10.5 to 19.5% over the last 3 years. The organizational structure is comprised of three layers--the owner, business unit management, and the teams, ranging in size from 6 to 75--including a team leader and team members. Each business unit focuses on a particular customer group and each team is responsible for a specific product or service, such as receiving, that supports the product teams. The organizations stated values include honesty, exceeding customer expectations, commitment, teamwork, and continuous improvement. The mission statement is "Proud Of It."

A high performance management system was instituted in 1990. Monthly sales per employee has increased to $16,400 in 1994 from $14,700 in 1991. The organization attributes most of the improvement to efficiencies associated with the high performance management system.

In terms of high performance work practices, the teams have varying degrees of decision-making authority concerning production scheduling, ordering supplies, customer service, and day-to-day operation. Information concerning business results and planning is regularly shared with all employees. Compensation beyond hourly wages includes increments of wage increase based on completion of skill-based classes and quarterly profit-sharing. Employees are offered on-site skill training of up to two hours per week, including quality tools and communication skills. Training is delivered through a local community college, the employees receive college credit, and the organization offers tuition reimbursement for any courses successfully completed on employee personal time. Based on the analysis of work practice systems (Table 3), this set of work practices is categorized as GSM stage 5a.

The traditional organization (TO) of approximately 155 employees primarily manufactures kitchen ventilators and air handling systems. In spite of the smaller size, this manufacturer was deemed an acceptable participant because a smaller organization will tend to have a more complex atmosphere than a larger organization that is similar in other respects. The size difference, then, exerts an influence counter to the hypothesis of less complexity associated with a traditionally run organization. The firm is privately held, with sales approaching $13 million and annual revenue growth of 25% in 1994 and 19% projected for 1995. The organizational structure consists of five layers, the owner, vice presidents, managers, supervisors, and nonmanagement employees in groups ranging in size from 9 to 28. The nonmanagement groups are hierarchically layered, including workers, crew chiefs, and leadmen. The vice-presidents head functional organizations, such as manufacturing and sales. The organization's literature describes the firm as an engineering and service oriented company. The philosophy is to design kitchen ventilation systems based on sound engineering, performance and operational requirements, to provide the highest quality fabrication and to give customers the best possible service.

In terms of high performance work practices, authority over day-to-day work operations resides in the leadman and supervisory positions. A newsletter summarizing business issues is provided quarterly. The organization has recently instituted a new pay structure based on skill progression. Discretionary profit-sharing occurs annually and the amount distributed is not based on a standard formula. Training focuses on functional task skills and a percentage of tuition reimbursement is available for job-related

classes.   Based on the analysis of   work practice systems (Table 3),   this set of work practices is categorized as GSM stage 4a.

Monthly sales per employee has improved to $43,000 for the first 5 months of 1995 from $35,000 for the same period during 1994.   The improvement is attributed to the stabilization of manufacturing processes for the new product line of air handling equipment.   Another productivity measure, ventilator footage per employee, has remained flat over the last 3 years, ranging from 160 feet to 178 feet.

Participant employees

Length of employment for the participants in the HPO ranged from 5 to 18 years with an average of 10.3 years.   The volunteers included 4 machinists, 3 assemblers, 2 employees in receiving, and 1 shipping clerk.   They ranged in age from 29 to 51 years with an average age of   39 years.   The group consisted of 5 women and 5 men, and, with the exception of 1 GED recipient, all had completed high school.   All participants have received some additional work related college course work.

Length of employment in the TO ranged from 1 to 18 years with an average of 4.8 years.   The volunteers included 4 assemblers, 3 welders, 2 metal cutters, and 1 in plumbing and closure production. Three of the participants were leadmen.   They ranged in age from 22 to 41 years with an average age of 31.5 years.   Because the organization employs only one woman in the manufacturing function, the group consisted of 10 men.   Seven of the participants completed high school, 3 of whom pursued 1 to 2 years of college course work, and 3 participants received the GED.

The Relationship Between Work Practices and Organizational Atmosphere

Analysis of   sample employee job descriptions for GSM stage of explicit task demand revealed a complement of 3b and 4a job responsibilities in the TO and a range of 4a to 5a responsibilities in the HPO, providing support for the hypothesis that the HPO has a more complex atmosphere.   The GSM stage analysis detail can be found in Appendix G.   In the HPO, one job description served all manufacturing and assembly team member positions.   In contrast, the TO provided a detailed individual job description for each employee position.

The implicit task demands characterizing organizational atmosphere are represented by the GSM stage analysis of interview data.   Because developmental stage is probably not normally distributed and due to small sample size ($N = 20$), the chi-square and Fisher's exact test are the principal data-analytic techniques.   Table 6 presents the results of the crosstabulation of organizational work practices with stage of organizational atmosphere.   Appendix H summarizes the data extracted from the interview.

Table 6.
Crosstabulation of the Relationship Between Organizational Work Practices and Stage of Organizational Atmosphere

(χ^2 (20) = 16.5, df = 2, p < .001, one-tailed

Sixty-seven percent of the employees in the TO described the atmosphere at GSM stage 4b and none at 5a, while 90% of the employees in the HPO described its atmosphere at GSM state 5a.   The differences between expected and observed cell frequencies are statistically significant and are characterized by a sturdy effect (χ^2 (20) = 16.50, df = 2, p < .001, one-tailed, Cramer's v = .91).   The null hypothesis that there is no association between work practices in use and stage of atmosphere is rejected.

Further, Goodman and Kruskal's λ (lambda), a measure of association, indicates a 64% reduction in error when type of work practices in use is used to predict stage of atmosphere.

Because the (χ^2 statistic applied to a small sample is suspect, the 2 x 3 table was collapsed over GSM stages 4a and 4b and stages 5a and 5b, resulting in the 2 x 2 contingency table presented in Table 7. Stages 4a and 4b are considered to be Piagetian early and late Formal operations, respectively, so the breakpoint becomes between Formal and Postformal operations.

Table 7.
2 x 2 Crosstabulation of the Relationship Between Organizational Work Practices and Stage of Organizational Atmosphere

Fisher's Exact (20) $p < .00006$, one-tailed, $\phi = .90$

According to the Fisher's exact statistic, the one-tailed probability is less than .00006 that a sample would produce by chance an association this systematic or more so, reinforcing the notion that organizational work practices and atmosphere are associated.   The ϕ of .90 indicates that the strength of association is substantial between organizational work practices and atmosphere.

Finally, to further define the association between work practices and stage of atmosphere, the qualitative data were quantified based on the ordering inherent in hierarchical stage results (Cochran, 1950), e.g., stage 4a became one, stage 4b became two, and an one way ANOVA applied.   Table 8 presents the ANOVA results.

Table 8.
One-way Analysis of Variance of Stage of Atmosphere by Organizational Work Practices

Work Practice	Mean	*SS*	DFMS	*F*
High Performance	2.9			
Traditional	1.7			
ANOVA	7.20	1	7.20	43.20**

Note.   Stage 4a = 1; 4b = 2; 5a = 3; 5b =4.

**$p<.001$.

The Levene statistic of   5.68 ($p = .028$) does lead to the rejection of a key assumption that the variances in each group are equal, not lending support to the suitability of ANOVA for this analysis.   The F ratio of 43.20 ($p < .001$) indicates that organizational work practices do not result in the same average stage of atmosphere and the direction of the difference is indicated by the high performance group mean of 2.9 relative to the 1.7 mean of the traditional group.

Ultimately, the HPO is categorized as having a 5a atmosphere and the TO as having a 4b atmosphere.

The Relationship Between Organizational Work Practices and Employee Performance

The chi-square, Fisher's exact, and one-way ANOVA are repeated for analysis of the relationship between work practices and task performance, with the following results.

Table 9.

Crosstabulation of the Relationship Between Organizational

Work Practices and Stage of Employee Performance

$\chi^2 (20) = 7.77$, $df = 2$, $p < .003$, one-tailed

Eighty percent of the employees in the TO described their performance at GSM stage 4b, while 70% of the employees in the HPO described their performance at GSM stage 5a, and 30% at 4b. The differences between expected and observed cell frequencies are statistically significant and are characterized by a moderate effect ($\chi^2 (20) = 7.77$, $df = 2$, $p < .05$, one-tailed, Cramer's $v = .62$). The null hypothesis that there is no association between work practices in use and stage of performance is rejected. Further, Goodman and Kruskal's lambda, a measure of association, indicates a 44% reduction in error when type of work practices in use is used to predict stage of performance.

Table 10.
2 x 2 Crosstabulation of the Relationship Between Organizational Work Practices and Stage of Employee Performance

Fisher's Exact (20) $p < .01$, one-tailed, $\phi = .61$

According to the Fisher's exact statistic, the one-tailed probability is less than .01 that a sample would produce by chance an association this systematic or more so, reinforcing the notion that organizational work practices and stage of employee performance are associated. The <u>phi</u> of .61 indicates that the strength of association is substantial.

Table 11.
One way Analysis of Variance of Stage of Employee Performance   by Organizational Work Practices

Work Practice	Mean	SS	DF	MS	F
High Performance	2.7				
Traditional	2.0				
ANOVA	2.45	1		2.45	10.76*

Note.   Stage 4a = 1; 4b = 2; 5a = 3; 5b =4.   *$p<.01$.

The Levene statistic of   2.25 ($p = .15$) does not lead to the rejection of a key assumption that the variances in each group are equal, lending support to the suitability of ANOVA for this analysis. The *F* ratio of 10.76 ($p < .01$) indicates that organizational work practices do not result in the same average stage of performance and the direction of the difference is indicated by the high performance group mean of 2.7 relative to the 2.0 mean of the traditional group.

Employee performance and organizational atmosphere are highly correlated ($r = .72$, $p < .001$).

The Relationship Between Organizational Work Practices and Employee Preferred Atmosphere

The Fisher's exact test is used to test the hypothesis that employees in the organization not using high performance work practices will be more likely to express preferences for an increase in the hierarchical complexity of their work task than employees in the organization using high performance practices.

Table 12.
Crosstabulation of the Relationship Between Organizational Work Practices and Preference for a More Complex Work Atmosphere

Organization Work Practices		Preference for Change	
	No Increase	Change Toward Complexity	
High Performance	10 100%		10
Traditional	7 70%	3 30%	10
	17	3	

Fisher's exact $p = .11$, one-tailed.

The null hypothesis that the proportion of employees expressing a preference for increased work task complexity is the same for both organizations is weakly supported ($p = .11$, one-tailed). The strength of the association, $\phi = .42$, suggests that type of work practices may have a modest effect on change preference and the fact that TO employees provided the only three examples of preference for increased work task complexity suggests that an effect may be present. Cohen's (1988) power tables indicate a 52% chance of not overlooking an effect at $\alpha = .05$ for a sample of 20. The marginal detection of effect may be due to small sample size.

In addition to the 3 participants from the TO who preferred an atmosphere of more complexity than the atmosphere characterizing the organization, 2 participants from the HPO expressed a preference for an atmosphere *less* complex than that found in the HPO.

Table 13.
Crosstabulation of the Relationship Between Organizational Work Practices and Preference for a Less Complex Work Atmosphere

Organization Work Practices	Preference for Change		
	No Decrease	Change Toward Less Complexity	

	8	2	10
High Performance	80%	20%	
Traditional	10		10
	100%		
	18	2	

Fisher's exact *p* = .24, one-tailed.

The Fisher's exact *p* of .24 moderately supports the notion that the proportion of employees expressing a preference for decreased work task complexity is the same for both organizations. The strength of the association, ϕ = .33, suggests that type of work practices may have a very modest effect on change preference.

Summary

Table 14 presents the summary of the data analysis concerning organizational work practices and the three categories of interest. Differences between the HPO and TO toward a higher stage in the former is supported, as hypothesized.

Table 14.
Summary of the Relationship Between Organizational Work Practices and Organizational Atmosphere, Employee Performance, and Preferred Atmosphere

	$\chi 2$	Cramer's *v*	λ	Fisher's exact *p*	ϕ	ANOVA *F*
Atmosphere	16.50***	.91	.64	.00006	.90	43.20***
Performance	7.77**	.62.44		.01	.61	10.76**
Change Preference: More Complex				.11	.42	
Change Preference: Less Complex				.24	.33	

** *p* < .01; *** *p* < .001.

A random sample of 38 scorable statements extracted from all interviews was scored by an independent scorer resulting in an interrater reliability of 63%. Analysis of the rater differences revealed that the study reflects a slightly lower estimation of statement stage scores over both organizations. The researcher and independent scorer agree on the overall systematic stage of the HPO atmosphere and the formal stage of the TO atmosphere.

The Relationship Between Employee Age and Stage of Performance

The mean age of 39 years in the HPO and 31.5 years in the TO are significantly different (t (18) = 2.42, *p* = .03). If age is significantly different between organizations, then some of the association between performance and organizational work practices may be attributable to age of participant employees. The correlation between employee age and stage of performance indicates that older

employees did not tend to perform at higher stages (r (19) = .10, p = .35).   Years of employment is also not strongly correlated with stage of performance (r = .27, p = .26).   Because age and tenure do not appear associated with stage of performance, the likelihood that stage of employee performance is primarily associated with work practices is strengthened.

<center>Job Satisfaction</center>

The mean job satisfaction of 4.3 in the HPO is moderately higher than the mean of 3.6 (t = .46, p = .05) in the TO.   Satisfaction was not significantly correlated with age (r = .38, p = .10), but is significantly correlated with years of employment in the organization (r = .58, p < .01).   The mean years of employment, 10.3, in the HPO is significantly higher than the mean of 4.8 in the TO (t = 2.59, p = .02). It is likely that the higher satisfaction score in the HPO is related to years of employment, and work practices may not critically influence employee satisfaction in this sample.

CHAPTER 5

Discussion and Conclusions

Through the lens of adult structural development, the high performance organization (HPO) indeed appears to be characterized by a more complex atmosphere than the traditional organization (TO). Concomitantly, HPO employees perform at a higher stage than TO employees. Finally, little support was found for the notion that TO employees tend to express, more than HPO employees, a preference for increased complexity of atmosphere. In this chapter, each of these findings will be examined, along with additional considerations concerning related theories and methodology.

Atmosphere and Work Practices

It is helpful to recall that the construct of organizational atmosphere is intended to represent the environmental influence on employee performance. High performance work practices provide a more complex set of contingencies (atmosphere) than traditional work practices. The powerful association between organizational work practices and stage of atmosphere supports this notion. Ultimately, a more complex stage of employee performance is reinforced.

The GSM stages thought to characterize system 1 and system 4 sets of work practices, adapted from the U S. Department of Labor research review and delineated in Table 3, appear to be generally accurate. The HPO systematic atmosphere relates to the system 1 set of practices, and the TO formal atmosphere is one stage higher than the abstract operations assigned to system 4. Because the systems of work practices reflect a continuum of possibilities, rather than intact sets, probably few organizations actually fit one particular system. In this study, the HPO did not reflect a pure work practice system 1. For example, the "pay-for-knowledge" compensation practice elicited formal operational logic (4b) such as "If they go take this class, they can make 2, 3, 4 dollars more than they were making before." The intent of the work practice is to increase the skills and cross-functionality of the employees to improve organizational flexibility and productivity, as well as advancing the general employability of the employee. If this intent was evident to the employees, their justification for the practice would be at least systematic (5a). For example, one can imagine a statement like: "If I take this class, I not only make more per hour, I can do more of the job functions. That means I am able to do whatever needs to be done to meet our production goals (and I deserve the higher wage, because I add more value)." The contingencies employees did associate with the work practice, however, do not reflect the 5a justification: "two people have the same knowledge. One produces 100 parts per hour and another produces 10 parts per hour. They still get paid the same."

The TO did approach a pure work practice system 4, with the only exception being a form of occasional profit-sharing. Unlike the HPO interviews, the profit-sharing was not mentioned by TO employees. Why did seven participants describe the TO atmosphere as formal (4b) rather than abstract (4a)? Most of the formal operational statements related to the hierarchical power structure in the TO. Example statements include, "I gotta let him [supervisor] know [what is going on], so he can say 'This is why' [to his manager]", and "If I make a mistake, it is my supervisor's fault," (describing roles). According to Commons et al. (1993, p. 214), "power is the behavioral control of contingencies that distribute reinforcement and reinforcement opportunity." The rules that are followed in this distribution of reinforcement and how they are set constitute atmosphere. In this case, the positional power structure is a formal operations phenomenon and that is reflected in the study results. Apparently, work practices provide surface evidence of the underlying atmosphere; they serve as clues to the rules of reinforcement characterizing the organization.

GSM stage analysis offers insight concerning why systems of high performance work practices have been found to improve organizational performance more that specific work practices. High performance work practices taken individually can be categorized as stage 4b. For example, simple profit sharing can be interpreted as reinforcement for each employee to maximize personal productivity and minimize waste. More complex stages of performance become evident through the synergistic influence of several practices. For example, profit sharing coupled with team accountability results in 5a logic, such as:

Instead of the leader watching over them, it would go better, if somebody wasn't doing their job, if it was somebody who is working with them. It gives me more responsibility. In the past, maybe I wouldn't have said anything. I would get my wage increase on my performance. Now it's everybody on our [profit sharing] award. If somebody is spending more money that they should be, then it comes out of my [profit sharing] award. They [HPO] want people to do that [say something].

The explicit task demands distinguishing each organizational atmosphere are evidenced in the employee job description (Appendix G). An instructive contrast in explicit task demands is revealed in how each organization characterizes quality management in the employee job function. The HPO expects employee participation in developing strategy, reviewing results, and implementing change to improve quality. These are at least stage 4b and 5a tasks. For the TO employee, involvement in quality practices pertains to meeting specifications for particular task steps. These are 3b to 4b tasks.

How might understanding the stage of atmosphere be useful to organizations? First, atmosphere provides one avenue for the evaluation of existing work practices. Since work practices are evidence of the underlying atmosphere, it is reasonable to expect them to consistently reflect the same GSM stage. Work practices representative of a stage different from the general atmosphere might cause confusion and dissatisfaction in organizational employees. The stage 4b pay-for-knowledge practice in the stage 5a HPO is a good example of stage inconsistency among work practices. Nine of the HPO participants stated that they were not satisfied with the pay-for-knowledge practice.

Second, atmosphere offers a way to gauge incremental change in complexity of work practices. Change in work practices reflecting increments of extension in complexity of no more than one stage helps to increase the probability that employees will succeed in the associated performance. For example, if the TO becomes convinced that increasing the complexity of its atmosphere will benefit organizational performance, they might begin by adopting a set of practices defined by formal operations, such as a consistent training process and formalized personal accountability at the worker level.

Performance and Work Practices

Stage of performance represents the stage of reasoning used in successful completion of the work task. Stage of performance is associated with organizational work practices, but not as definitely as atmosphere. Stage of employee performance in the HPO is predominantly systematic (5a), while stage of performance in the TO is primarily formal operations (4b). Successful performance in the HPO appears to require a higher stage of reasoning than successful performance in the TO.

The difference in stage of performance is demonstrated in the perspectives the TO and HPO employees tend to take regarding quality. Commons et al. (1993, p. 212) contended that individuals in "organizations in which decision making is grounded in lower stage perspective-taking" (i.e., stage), are likely to express interest only in how the decision affects them personally. Such a perspective is expressed by the TO employee statement:

[I'd like them to] be a little more careful on their part.   I know we do.   When we put it on the floor, and the people in front of us start bitching   about our work, we don't want to hear it, so we're making it better.   Sometimes you do get bad parts and you can't make that [product] look good or right, so you just compromise and give it to them and they go through the pain, too.

Higher stage perspective-taking is expressed in the HPO employee statement:

We're assuring we make a quality part.   Say if something did happen and all of a sudden somebody took apart the [product] and had somebody inspect it and all of a sudden [the organization] has a lawsuit because [we] shipped parts out of print ... we'd hear about it.   That could be the end of the company, or it could affect everybody.   We don't want to do that.   We need to keep a good relationship with [the customer], because if we don't,   they won't want any new products.

The results sustain the relationship between cognitive development and employee performance proposed by cognitive researchers.   The relationship between the cognitive demands of the job and thought processes of employees found by Warr and Conner (1992) is supported.   Work practices represent the cognitive demands of the task and stage of performance represents thought processes .   The relationship between cognitive complexity and performance found by Streufert and Swezey (1986) is also supported, but not in the sense that cognitive complexity predicts performance.   Rather, a more intricate relationship is suggested, associating successful performance with the presence of the stage of reasoning demanded by the particular work environment.   The following section examines this interaction.

<p align="center">Atmosphere and Performance</p>

Following the interactionist tradition, one would expect the stage of employee performance and the stage of employee interpretation of the organizational atmosphere to correspond.   Study results indicate a strong, but not perfect, association.   Acknowledging that differences found in the study may be due to chance, nevertheless, it is informative to examine the factors that might cause employee performance to deviate from the associated atmosphere.

The two instances of stage of atmosphere exceeding stage of performance occur in the HPO.   The employees perform at the formal operational stage (4b), while grasping the systematic elements of the organizational atmosphere.   In one case, the employee strongly expressed a desire for the success of the systematic atmosphere in terms of individual employees pulling together to achieve team performance goals.   He believed that this success was not possible because "There's still people out there that basically say, 'What have you done for me lately?' "   Other HPO employees, performing at the systematic stage (5a), tended to describe 5a stage solutions for similar problems: "The more we meet, the more they see the different changes [good ones] that are happening ... if you do it this way.   It's coming along."   The conflict expressed by the employee performing at stage 4b might serve to catalyze stage development as described by the structuralist tradition.   This analysis suggests that lag in stage of development of performance may contribute to performance--atmosphere inconsistency.

The second HPO employee having inconsistent performance and atmosphere stage scores described her task, such as customer contact, with formal operational logic, but described the team aspects of task performance with systematic logic.   Her position was clerical in nature, rather than in the manufacturing shop team environment, perhaps resulting in a unique set of contingencies.   This analysis suggests that performance subdomains may contribute to performance--atmosphere inconsistency in this study.

In the TO, three employees described performance at a higher stage than atmosphere.   One employee performed at stage 5a, but described the organizational atmosphere at 4b.   This employee had worked for

a national organization known for its team orientation and, with only a little more that 1 year's employment at the TO, retained the logic learned in the team environment. Statements, such as "If we can't work together, we can't learn together. We've got to work as a team," were incongruent with those expressed in all other TO interviews. This employee also preferred a 5a stage atmosphere. Analysis of this interview suggests that recent previous work experience in an atmosphere more complex than that of the present work environment plays a role in performance-- atmosphere inconsistency.

Because of the interactive relationship between performance and organizational atmosphere, this employee will probably either learn to adapt his performance to the current atmosphere if he cannot influence it, leave the TO, or help to influence the atmosphere toward his systematic preference. Because employee action is the operator by which the person changes the environment (McGuinness, Pribram, & Pirnazar,1990) and because atmosphere includes the developmental influence of the individual on the organization (Commons et al., 1993), it is likely that traditional atmospheres will be perturbed toward more complex work practices through the influx of employees with work experience in the growing number of organizations using high performance systems. Alternatively, organizations may become increasingly differentiated according to atmosphere and tend to attract and retain only compatible employees.

Finally, two employees, who characterized the TO atmosphere at 4a, described their performance at 4b. When asked to explain "why things happen like this around here" (to elicit statements reflecting atmosphere), neither employee identified clear justifications. One employee tended to answer "I don't know" and offer indiscriminate guesses, while the responses of the other employee revealed no apparent formal operational rules underlying organizational practices, noting that things "just happen."   The former employee's performance only marginally met the criteria for stage 4b, diminishing the meaningfulness of the difference between performance and atmosphere. The latter employee's responses regarding atmosphere, uniformly 4a, may have been influenced by animosity expressed toward the organization, while his pride in task accomplishment influenced responses regarding performance, uniformly 4b. The employee stated that, when his personal life permits change, he will leave the organization unless the environment offers him increased opportunity.

Information regarding the constraining effect of atmosphere on performance proposed by Commons et al. (1993) can be examined from two perspectives. First, if stage of performance is higher than the stage of atmosphere, then the performance would not be considered constrained. This condition occurred in 3 of the TO interviews and none of the HPO interviews. Interview analysis suggests that prior higher stage experience in the work domain overcomes constraining effects of atmosphere, at least over the short run. Over the long run, performance that is more complex than atmosphere may continue if the performance is based on personally important intrinsic variables. Despite the described exceptions, the notion of atmosphere constraining the development of performance is supported because of the strong association between atmosphere and performance.

If stage of performance is constrained by atmosphere, is the untapped stage of performance already developmentally available, or is development of higher stage performance stalled at the stage of atmosphere? Constraint on stage of performance that is available would be suggested if employees expressed a preference for an atmosphere more complex than existing atmosphere and performance, implying comfort with the higher stage of complexity. Because results did not strongly support this notion, atmosphere does not appear to constrain available stage of performance in this study.   The ceiling on performance relates to the developmental process.

The interactive relationship between performance and atmosphere was conspicuous in performance statements, consonant with interactionist expectations. For example, the hierarchical structure of the TO

is clear in the performance description, "If it's something totally wrong [with the part], then we got to figure out what to do.   That goes back to the supervisor, and he has to figure it out."   The participative atmosphere of the HPO is evident in the performance statement, "The decision was made by everybody, so everybody knew what was going on and we didn't have to repeat it."

Preferred Atmosphere

The idea that other life domains demand higher stage performance than the TO atmosphere, resulting in a preference for a higher stage work atmosphere than the existing one, is tenuously supported.   Three TO employees preferred an atmosphere at a higher stage than their interpretation of the existing atmosphere.   It has already been noted that the one preference for 5a atmosphere appears to be associated with previous 5a work experience.   Aside from this employee and 1 employee preferring 4a atmosphere, all TO participants preferred a 4b atmosphere and 2 of these perceived it to be an increase in complexity of atmosphere.   For the TO employee population, the predominant stage of development is clearly formal operations, consistent with the findings of Neimark (in Commons, Grotzer, & Davidson, 1991) and Commons, Galaz-Fontes, and Hernandez-Morelos (1992).

In alignment with Kegan's (1994) assertion that the demands of modern life are at a 5a order of complexity, the predominant stage of preferred atmosphere in the HPO is systematic operations.   It is postulated that the demands of high performance work practices correspond with "demands of modern life."   Three HPO participants prefer a 4b atmosphere, two of whom were characterized by 5a stage performance and atmosphere.   All cases were marked by a low incidence of statements reflecting preferred atmosphere,   increasing the likelilhood that stage score relates to insufficient probing at the moment of eliciting these statements. Consequently I forgo conjecture concerning the 4b preference.

It was expected that TO participants would prefer a higher stage atmosphere because they are comfortable with systematic operations in other life domains.   The gap between actual and preferred atmosphere would represent untapped work performance potential in the TO.   This was not found.   In contrast with the presupposition, the results lead to the argument that the HPO systematic atmosphere represents the developmental edge in the participant's life experience.

Implications and Conclusions

This study suggests that high performance work practices may affect the development of employees through increased complexity of organizational contingencies.   For manufacturing shop employees, including welders and assemblers, this development involves at least a one-stage transition to systematic from abstract or formal operations.

The methodology cannot support causal interpretation because it provides only a snapshot of the dynamic relationship between employee performance and the work environment.   The longitudinal effects of the individual and the environment on each other, reflective of an interactive model, are not addressed.   The developmental comparison of organizational atmosphere and employee performance between organizations with contrasting work practices is intended to suggest some characteristics of the employee performance--work environment relationship.   All determinants of employee performance are not addressed by this methodology, including social factors and changes in cognitive functioning associated with aging.   The effect of variation in employee literacy and ethnic diversity on performance, both issues in many manufacturing organizations, also remain untapped by this study.

Because the TO population did not include women, the influence of gender is not assessed.   No gender differences emerge from examination of the HPO participants results, so gender probably did not contribute to the differences found between the HPO and TO.   Gender might influence differences in

performance and atmosphere preference between men and women in a traditional organization because of gender specific experience and tasks outside the workplace in this population. For example, women might be more or less likely than men to express a preference for higher stage organizational atmosphere.

The findings may not generalize to other industry classifications and job functions, however, the study results suggest direction for future research. Clearly, a longitudinal study of the planning, execution, and fruition of a high performance management system implementation would serve to further the understanding of the relationship between organizational work practices and the associated employee performance. The GSM provides useful framework for analysis of the person--environment relationship. Research providing broader and more detailed understanding of business organizational atmosphere may provide practical insights for organizational professionals interested in optimizing employee performance. For example, research regarding atmosphere may help us understand what contingencies do and do not nurture the emergence of the most effective organizational performance, including performance flexibility over changing conditions.

Because of improved productivity associated with high performance work practices, it is enticing to assume that higher stage, more complexity, is better. Each organization is responsible for identifying a suitable system of work practices to achieve their objectives. If an organization is interested in moving toward high performance, I suggest that initially the stage of organizational contingencies be made uniform and stabilized at the highest extant stage. Adjustments to the organizational management system, that may include quality management or reengineering, could then be implemented through thoughtful construction of appropriate work practices. Thoughtful construction includes evaluation of congruence between organizational strategy and the performance reinforced by work practice contingencies and acknowledgment of employee developmental readiness to meet performance expectations. Acknowledgment of developmental matters includes a one-stage limit to changes in complexity--a transition from abstract to systematic operations would probably not succeed--and a program to provide the information, feedback, and reinforcement required for stage development of performance (Commons Grotzer, & Davidson, 1991). GSM analysis of this process would disclose vital longitudinal information concerning the developmental interaction between organizational work practices and employee performance.

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APPENDIX A

An Example of Applying the General Stage Model

An example of applying the General Stage Model to the Influence section of high performance and traditional employee interviews.

   This appendix illustrates the scoring methodology used in this dissertation.   The methodology is an adaptation of the General Stage Scoring System (Commons, Johnstone, Straughn, Meaney, Weaver, Lichtenbaum, & Krause, 1992) similar to the scoring scheme used by Lam (1994) and delineated by Commons, Sonnert, & Lam (1995).   The examples describe a GSM stage 5a response for the high performance interview and GSM stage 4b response for the traditional interview, reflecting the stages generally found in each type of organization.   Both examples are drawn from the scoring category concerning performance.   Statements in the categories of atmosphere and preferred atmosphere are similarly scored.

The High Performance Example

Participant #hp930 -- GSM Stage 5a

What influence do you have here?

>   *We have to go to meetings all the time to share our ideas.   Be sharp on our machines, how the machine operates and makes the parts--really know and understand that so when we do have a meeting about a new part, we can say this is what the machine can do and can't do.   How I can influence change is through doing that, my knowledge of the machine.   No body else knows as good as I do.   The quality technician doesn't know, the team leader doesn't know.   What they know is how it operates.   They don't know the little techniques that go along with it.   That's how we can influence the most--through our machine knowledge.   That, and getting educated. We gotta always keep up on blueprint reading classes, in-house, and sometimes we gotta go to community college machine schools.   That basically ... how we can influence change in the company is get more educated, understand our role here at [organization].   The more I get involved, I know I need to get educated.*

Overall Score

GSM Stage 5a (Systematic)

The participant successfully builds one system of influence based on machine knowledge and the consequent power of that information in the decision-making process.   A second system of influence based on education is not successfully completed.

GSM Stage 4a Analysis (Abstract)

Abstract propositions are general statements, usually linking together variables with a predicate. Propositions often state one value of a variable.

Propositions
a.   We have to go to meetings all the time to share our ideas.

b. (We have to) be sharp on our machines,
c. (be sharp on) how the machine operates and
d. (be sharp on how the machine) makes the parts--
e. really know and understand that
f. so when we do have a meeting about a new part,
g. we can say this is what the machine can do
h. and can't do.
i. How I can influence change is through doing that,
j. my knowledge of the machine.
k. Nobody else knows as good as I do.
l. The quality technician doesn't know,
m. the team leader doesn't know.
n. What they know is how it operates.
o. They don't know the little techniques that go along with it.
p. That's how we can influence the most--
q. through our machine knowledge.
r. That, and getting educated.
s. We gotta always keep up on blueprint reading classes,
t. in-house,
u. and sometimes we gotta go to community college machine schools.
v. That basically how we can influence change in the company is get   more educated,
w. understand our role here at (organization).
x. The more I get involved,
y. I know I need to get educated.

GSM 4b Stage Analysis (Formal)

In formal operations, propositions are linked through relational words (if ... then).   Reasoning is about concepts and justifications are based on rules.

*Relation a_1.b > f, g   (If) we are sharp on our machines, (then) when we have a meeting about a new part, we can say this is what the machine can do.
*Relation a_2.b > f, h   (If) we are sharp on our machines, (then) when we have a meeting about a new part, we can say this is what the machine can't do.

Propositions c, d, and e further describe proposition b, so do not result in new relations.

Relation b.   q > p Through our machine knowledge, that's how we can influence the most.
Relation c.   r > p Getting educated, that's how we can influence the most.
Relation d.   x > y (If) I get involved more, (then the more) I know I need to get educated.

GSM 5a Stage Analysis (Systematic)

In systematic operations, statements reveal interactions among variables forming a system. References are to systems and relationships between formal relations.

System 1.   (b > f, g) & (b > f, h) > i

   (If) we are sharp on our machines, (then) when we have a meeting about a new part, we can say this is what the machine can and can't do, (resulting in) how I can influence change.

*System 2.   Link between education and understanding role not clear, nor is how the two variables interact to lead to influence. Logic not successfully completed.

If we get more educated, then we understand our role here at (organization), leading to how we can influence change.

GSM 5b Stage Analysis (Metasystematic)

In metasystematic operations, systems are coordinated with rules common to both.   Systems are compared.   The participant did not complete this logic.

Using the variables in this example, metasystematic operations might be reflected in statements relating the system of organizational involvement with the system of education, resulting in a continuum of increasing influence

The Traditional Example

Participant #t216 -- GSM Stage 4b

What influence do you have ... what difference do you make around here?

I don't know if I really make a difference.   If I were gone for a week or two, they'd miss the skill part--someone putting out that footage.   I took some time off in June.   They were busy.   I think it was more strain on my co-workers than it was on the company, because they had to pick up what I ... because I wasn't there...   I don't think the company really missed <u>me</u>.   I know the guys out on the floor did because they're the ones that had to pick up what I didn't do.   I know when they take off, I feel like I have to fill in for them.*

Overall Score

GSM Stage 4b.

The participant builds several formal relations describing why he is missed by his co-workers, but probably not by the company.   The participant does not clearly associate the relations with making a difference.

GSM Stage 4a Analysis (Abstract)

Propositions
a.   I don't know if I really make a difference.
b. If I were gone for a week or two,
c. they'd miss the skill part--
d.   someone putting out that footage.
e. I took some time off in June.
f. They were busy.
g.   I think it was more strain on my co-workers
h.   than it was on the company,
i. because they had to pick up what I ...
j. because I wasn't there...

k.   I don't think the company really missed <u>me</u>.
l.   I know the guys out on the floor did
m.   because they're the ones that had to pick up what I didn't do.
n.   I know when they take off,
o.   I feel like I have to fill in for them.

GSM 4b Stage Analysis (Formal)

Relation a. $b > c$ If I were gone for a week or two, they'd miss the skill part.
Relation b. $b > d$ If I were gone for a week or two, they'd miss someone putting out that footage [of product].
Relation c_1. $i > g$ Because they had to pick up what I [wasn't there to do], it was more strain on my co-workers.
Relation c_2. $i > h$ Because they had to pick up what I [wasn't there to do], it was [less strain] on the company than on co-workers.
Relation d. $m > l$ Because they're the ones that had to pick up what I didn't   do, I know the guys out on the floor did [miss me as an   individual].
Relation e. $n > o$ I know when they take off, [then] I feel like I have to fill in   for them.

APPENDIX G

GSM Analysis of Job Descriptions
GSM Stage Analysis of Job Descriptions

High Performance Organization

GSM Stage

4a   Implements the Quality Policy and Procedures in all aspects of daily duties and responsibilities.

5a   Participates in defining strategies to meet quality objectives and participates in system reviews within the team as necessary.

4a   Participates in Pay-for-Knowledge compensation program.   Satisfactorily completes organization classes as required.

5a   Participates in team meetings as necessary (safety, problem solving, etc.).

*4b   Rotates into other positions within the team as necessary to meet production requirements.

*5a   Participates in organization's selection process as necessary.

5a   Suggests process and procedure improvements when appropriate.

4a   Works in accordance with organization's policies and procedures.

*4b   Works with Team Leader to determine training and development needs and, if appropriate, develop a training plan.

*

Traditional Organization

4a   Position follows procedure set by ventilator leadman.   Supervised by ventilator leadman.

3b   Position is not supervisory.

*3b   Direct communication with ventilator leadman.   Responds to input from Quality Assurance Inspector or Department Head.

*4a   Must be able to weld and finish staining steel maintaining a high degree of quality.

4a   Job requires the ability to read and work off blueprints using both fabrication and basic wiring skills.

4a   Must be able to channel product from staging, to inspection, completing all necessary steps.   Operate shear, notcher, and hand brake.

Microsoft Word 10.0.6612;

APPENDIX H

Summary of Data

APPENDIX H

Summary of Data

#	Age	Gender	Tenure	Educ.	Satis.	Security	Perf.	Atmos.Pref.	Grp
W1	35	Male	12	12	4	5	4b	5a	5a	HPO
W2	37	Female	5	12	4	5	5a	5a	4b	HPO
W3	41	Female	16	12	4	4	5a	5a	5a	HPO
W4	51	Female	11	12	5	4	4b	5a	5a	HPO
W5	49	Female	18	14	5	5	5a	5a	5a	HPO
W6	37	Male	7	12	3	5	5a	5a	5a	HPO
W7	32	Male	6	12	4	4	5a	5a	5a	HPO
W8	37	Female	11	12	5	5	5a	5a	4b	HPO
W9	29	Male	7	10	5	5	5a	5a	5a	HPO
W10	42	Male	10	12	4	3	4b	4b	4b	HPO
G1	24	Male	6	12	4	4	4b	4b	4b	Trad.
G2	24	Male	3	10	2	3	4b	4b	4b	Trad.
G3	37	Male	1	12	3	5	4b	4b	4b	Trad.
G4	34	Male	3	14	4	5	4b	4a	4a	Trad.
G5	32	Male	6	12	4	4	4b	4b	4b	Trad.
G6	27	Male	1	12	4	5	5a	4b	5a	Trad.
G7	41	Male	18	14	5	3	4b	4b	4b	Trad.
G8	34	Male	2	10	3	4	4a	4a	4b	Trad.
G9	22	Male	1	10	4	4	4b	4b	4b	Trad.
G10	40	Male	7	13	3	5	4b	4a	4b	Trad.