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GRASSROOTS CHANGE: VARIABLES AFFECTING ROLE INNOVATION

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ABSTRACT

GRASSROOTS CHANGE: VARIABLES AFFECTING ROLE INNOVATION

By

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This study provided a construct definition and a conceptual model involving the predictors and outcomes of role innovation. The study considered the impact of climate for innovation and goal focus on role innovation. The process of role innovation was also assessed by studying the impact and contribution of horizontal member exchange and role negotiation. The effect of mastery and performance learning orientation as well as individualism/ collectivism and two final outcomes, performance and task satisfaction, were also investigated. The participants were 228 undergraduates who worked in dyads on a Tinker Toy building task. Coders later assessed videotapes of the production sessions to determine whether or not certain role innovations had occurred. The results indicated that climate for innovation affected role innovation, but few of the other primary hypotheses were supported.

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INTRODUCTION

In today's dynamic, unpredictable environment, businesses and organizations cannot just proceed "as usual." As the realities of the changing workforce, worldwide economy, foreign trade and cut-throat competition begin to impact the marketplace, organizations need to find innovative ways to survive the fray. Kiernan (1993) said it succinctly, "In a world of ceaseless turbulence and discontinuous change, innovation has become one of a handful of critical preconditions for survival, as the rapidly shrinking half-lives of many Fortune 500 companies bear ample testimony." (p. 11)

Innovation is critical for organizational survival today, yet true innovative power lies within individuals. Kanter (1983) noted, "...individuals actually need to count for more, because it is people within the organization who come up with new ideas, who develop creative responses, and who push for change before opportunities disappear or minor irritations turn into catastrophes." (p. 18) In order for organizations to gain competitiveness through innovation, individuals need the freedom to create and innovate.

The current business environment rarely supports creativity and innovation. Organizations often try to control the behavior of their employees - including innovative behavior. The nature of the creative process makes it difficult for organizations to control innovation; employees cannot innovate upon command (Farr & Ford, 1990). Furthermore, many organizations have internal controls that maintain the status quo and discourage creativity and innovation. For example, most organizational socialization programs teach newcomers to conform to traditional practices and norms, not to develop new and different ideas (Van Maanen, 1978).

Demanding innovative behavior from employees might prove to be an impossible task. However, many employees already perform unobtrusive but useful innovations in their current positions. This grassroots innovation occurs as employees change or modify their personal roles and tasks and are initiated by the employee without organizational intervention. This grassroots form of innovation, called role innovation, is initiated by the individual and is not directly controlled by the organization. Role innovation encompasses many behaviors including an employee changing his or her tasks, work situations and interpersonal interactions in the workplace (West 1987b; Farr & Ford, 1990). Workers develop new strategies for completing their tasks, re-negotiate their position with co-workers and even develop new goals. Role innovation is often overlooked as a value-added activity, probably because it is not as startling or dramatic as other forms of innovation - such as unveiling a new product (Ettlie & Reza, 1992).

Although the immediate impact of role innovation may be small and focused on the employee's role, the effects are likely to aggregate and make an impact at the organizational level. By role innovating, employees may improve their own productivity, performance and satisfaction. Employees who role innovate are also might find new and better ways to do their jobs. Eventually, these improvements could be spread to the rest of the organization. It is time to recognize the grassroots innovation that is already occurring in the workplace and recognize its potential benefits.

Structure of Paper

In this research, I tried to contribute to the role innovation literature by providing empirical data exploring the predictors and outcomes of role innovation. I hoped to make

the following contributions. First, I provided a construct definition of role innovation. Second, I reviewed and discussed existing research on role innovation. Third, I presented a laboratory study based on a conceptual model that addressed two primary research questions surrounding role innovation. The first research question was: Will the organizational factors of climate for innovation and goal focus (group versus individual goals) affect role innovation? The second question was: How do HMX and role negotiation contribute to the role innovation process in interdependent workgroups?

In order to answer these questions, I used the following structure for the paper. I started by developing a new definition of role innovation that pulled from existing research and added neglected elements. I highlighted the important features of the new definition and distinguished it from related constructs. Next, I discussed climate and goal focus, two organizational factors expected to influence role innovation. In order to investigate the role innovation process, I used the Horizontal -Member Exchange (HMX) construct (Nason, 1995) and role negotiation to explore the interaction element of role innovation. After discussing the central constructs, I presented the model and hypotheses that guided my study. After discussing the theory, I presented the method, results and discussion of the study.

CONSTRUCT DEFINITION

When approaching a relatively fuzzy construct such as role innovation, the vital step was to develop a conceptually distinct and bounded definition. It was important to answer the question: What is role innovation? In this section, I defined the process of role innovation. Since employees differ in their roles, situations and needs, it was a challenge to define role innovation in a way that captured the variety of possible innovative behaviors. Researchers studying role innovation seem to have an implicit understanding of the concept, yet few provide explicit, measurable definitions.

Jobs versus roles

Role innovation is a complex construct that is difficult to define. However, the role and role-making literature (e.g. Katz & Kahn, 1978) offer a good starting place. The role literature provides a foundation for defining role innovation. An important step is to realize that roles are distinct constructs from jobs. Ilgen and Hollenbeck (1991) provided a thorough comparison of jobs and roles. They defined a job as a set of task elements grouped together under one job title and designed to be performed by one individual. A job can be described by its tasks, goals, skill requirements and boundaries. This objective, bureaucratic feature of jobs makes them quasi-static and establishes them as a basic unit of the organization.

Although they include the elements of jobs, roles encompass a broader set of elements such as social relationships. Ilgen & Hollenbeck (1991) wrote, "Roles are larger sets containing emergent task elements plus those elements of the jobs that are communicated to the job incumbent through the social system and maintained in that

system" (174). This definition of roles highlighted two important points. The first point is that roles contain emergent task elements which are responsibilities and duties that develop over time for an employee. Emergent task elements may become expected duties for the employee, but they are not included in the formal job description. The second point is that roles are based in, and maintained by, the social system. Roles are not objective, they are based on interpersonal relationships and social influences in the workgroup. Essentially they are the interconnections among jobs and the people who occupy them. In summary, roles have less precise boundaries than jobs, include formal and informal task elements and are part of the social system of organizational structure.

Role theory

One of the important characteristics of roles is their social nature. Katz and Kahn (1978) discussed the importance of the social system and it's influence on individual behavior. They described organizations as being a contrived system of roles. Roles are more than a set of tasks, because roles differ based on social elements. Roles are not defined in an objective vacuum; they are dependent on the interaction and input of other people. The other people in an organization who affect an employee's role are termed the role-set (Katz & Kahn, 1978). The role set consists of interrelated individuals in a social system usually bound by workflow or official sanction. Although Katz and Kahn (1978) recognized the existence of many types of roles and groups in organizations, this paper will focus on workgroups (supervisors and co-workers) connected by interrelated tasks. Members of the role-set develop role expectations (expected patterns of behavior and

responsibility) for each member of the role-set based on each one's needs, skills and interactions.

Katz and Kahn (1978) described the process of a role episode in a social system. The role episode is a cyclic, on-going process that involves role-sending and role-receiving. Role-sending involves one person sending a message with certain intentions. The sender can intend the message to merely inform the receiver or to actually influence, direct or control (Katz & Kahn, 1978). The message reflects the sender's perceptions of the receiver's role in the group. Role-receiving occurs when the other person receives the message and interprets it. Every individual has subjective perceptions of the organization and his or her place in it.

People can interpret messages in very different ways. This leads to the development of different roles and expectations (Katz & Kahn, 1978). The messages and intent of the messages interact with perceptions of the message to develop roles for people. Role taking reflects the interaction between the focal person (employee) and other members of the role set (workgroup). For example, a member of the role-set, such as a supervisor, could request that the focal person perform a task. In the role episode, the focal person receives the role from the sender and determines how to respond based on the content and attitude of the request. The same role sent from the supervisor could be interpreted differently by different focal people. This interpretation is influenced by each focal person's role expectations, personal attributes and interpersonal factors (Katz & Kahn, 1978). Roles are largely based on perceptions of different people in the organization.

The role-set perceives each employee within it as an individual with varying strengths, weakness and relationships. For instance, employees have differing latitudes to make mistakes or unusual suggestions. In 1958, Hollander suggested that workers earn idiosyncratic credits when they are good, contributing members to the group or organization. As they accumulate these credits, employees can exchange them for the opportunity to exhibit unusual behavior without incurring sanctions for violating norms. He also indicated that workers must establish credibility before implementing changes or exhibiting unusual behavior (Hollander, 1958). This is one example of employees having different roles, expectations and demands.

More recent research has focused on how roles develop between supervisors and employees (Graen & Scandura, 1987) and between same-level team members (Seers, 1989). This research will be discussed later in the paper as part of the description of the new construct of Horizontal Team Member (HMX) exchange. The key ideas presented by the role literature is that roles are socially determined, encompass task elements of jobs and vary between members of the role-set.

Defining Role Innovation

In order to effectively study role innovation, a solid definition of it was needed. The definition had to explain the construct in a thorough, concrete and researchable manner and distinguish role innovation from related constructs. The previous discussion of roles pointed to two critical factors that needed to be incorporated into a definition of role innovation. The first factor was the idea that roles include the elements of a job (Ilgen & Hollenbeck, 1991), therefore role innovation needed to incorporate job elements

by being task-focused. The second factor was that roles are socially determined (Katz & Kahn, 1978), and therefore role innovation needed a social element. I examined the definitions of role innovation in the current literature and tried to demonstrate how they fail to include one or both of these important elements.

Existing definitions

Past researchers provided definitions of role innovation that contained different elements and levels of detail. Van Maanen and Schein (1979) discussed role innovation as one possible outcome of socialization. They conceptually defined role innovation as the rejection and redefinition of the major premises concerning the missions and strategies that were followed by the majority of role occupants to both practice and justify their present role. This definition focused on strategic, occupational-level aspects such as changes in missions and goals. It is not task-focused and does not explicitly include a social element. The definition reflects some of Schein's earlier interest in role innovation at the professional-organization level (Schein, 1971). Schein (1971) described role innovation in the case of a professional who wanted to redefine the norms of his or her profession.

West (1987b) presented a more simplistic definition. He defined role innovation as the introduction of significant new behaviors into a role. This definition did not specify that role innovation should be task-focused and contain a social element. The lack of specificity in the definition would make it hard to operationalize. Farr and Ford (1990) defined role innovation as "the intentional introduction within one's work role of new and useful ideas, processes, products or procedures." (63) This definition does

provide one important distinction. It distinguishes between role innovation and the emergent elements included in the definition of roles. Role innovation behaviors are intentional, whereas the emergent elements pertaining to roles often develop rather haphazardly. This definition also dictates that the individual must initiate role innovation; it is not a organizationally imposed event. This definition focuses on the active involvement of the individual and the outcomes of role innovation such as ideas, processes, products or procedures.

Nicholson (1984) also presented a definition of role innovation, but he labeled it role development. He defined role development as a proactive strategy in which a person tries to change role requirements to better match his or her needs, abilities and identity. This definition captures the proactive nature of role innovation and the motivation for it. However, the definition neglects to identify a level of focus (task-focus) or the importance of social influence.

Construct Definition

A definition of role innovation should incorporate traditional elements of the definition as well as be task-focused and include social elements. For the purposes of this paper, role innovation was defined as:

> "A job holder's proactive process of changing role expectations and interaction within a workgroup with the intention to introduce new and useful ideas, processes or procedures for completing tasks."

With this definition, I have tried to make six key points. The definition captured the two critical elements of role innovation: task-focus and social influence. The first key

element of the definition is that role innovation is task-focused. Role innovation occurs as the employee is trying to find a better way to do the job. Role innovation would result in changes to the job tasks through behaviors such as reorganizing processes, introducing new ideas and re-defining work relationships with other people. Second, the social nature of role innovation indicates that it can also influence interactions with the workgroup (role-set). The social influence is reflected by changes such as re-defined interpersonal interactions, shifts in responsibility, and related role innovations by others in order to coordinate an interrelated process.

The third key point is that role innovation is a voluntary behavior initiated by the individual, not one dictated by the organization. This is the "grassroots" nature of role innovation. Role innovation springs from the fundamental unit of the organization - the individual employee. Fourth, role innovation is an intentional behavior. The intentionality of role innovation helps distinguish it from the emergent elements included in the basic definition of roles. The fifth point is that the intent of role innovation should be to improve or benefit the job or work situation. Sometimes changes have unexpected negative outcomes, but role innovation must be distinguished from negatively-intentioned role changes such as sabotage or withholding effort (Kidwell & Bennett, 1993). Finally, it is important to note that role innovation is a process.

Distinction from related constructs

When defining a construct it is also important to set boundaries that distinguish it from related concepts. Though many similarities exist, I will argue that role innovation is

a distinct concept from the standard treatments of the three following concepts: extra-role behavior, job design (job enlargement), and product innovation.

Extra-role behaviors (ERBs) are positive, discretionary behaviors which are not included within a formal job description (Van Dyne, Cummings and Parks, 1995). ERBs are usually defined as positive, helping behaviors which are directed at another person or the organization. ERBs include non-required behavior such as helping co-workers, maintaining positive attitudes, keeping workgroups members informed, and participating in company politics and events. Because role innovation focuses on task changes, not helping behaviors, it is distinct from extra-role behaviors. The recipient of the behavior also differs. Role innovation is focused on the individual's own job. People role innovate in order to improve their own position, relationships or job tasks. Extra-role behavior is focused outwardly at co-workers or the work group (Van Dyne et al., 1995).

Since role innovation adds and/ or changes the tasks of a job, it is similar to job design efforts focused on job enlargement. Based on job design principles (Hackman & Oldham, 1980), job enlargement involves combining jobs and adding ancillary duties to jobs (Campion & McClelland, 1991). Role innovation differs from job enlargement in three distinct ways. First, job enlargement is usually a change that is designed and implemented by management (e.g. Campion & McClelland, 1991). This formal, top-down implementation is strikingly different than the grassroots, informal nature of role innovation. Second, job enlargement means adding new tasks to a job, whereas role innovation sometimes just involves altering existing tasks. Third, the job design concepts

focus on single jobs or a class of jobs. Role innovation focuses on tasks and creates a link among roles.

The study of individual innovation often centers on product invention or development (e.g. Scott & Bruce, 1994; Ettlie & Reza, 1992). Research and development laboratories create new technological marvels and products. Product innovation is generally limited to a few research and design and manufacturing organizations (e.g. Galbraith, 1982; Van De Ven, 1986). Role innovation can potentially occur in all types of organizations within all job categories. Another fundamental difference is that product innovation is initiated by the organization and is often someone's assigned job (Staw, 1990). The definition of role innovation stresses that it is a grassroots effort initiated by the individual which is outside of the job description.

Though I have tried to show that role innovation is distinct from these three concepts, I recognize that some similarities exist. Role innovation and extra-role behavior both concern behaviors that are not a formal part of the job. People do not engage in them with the expectation of a formal reward. It is possible that people who engage in extra-role behaviors will also role innovate when they are dissatisfied with their role. Job design and role innovation both focus on improving the job. Product innovation and role innovation both involve the introduction of something new into the organization.

LITERATURE REVIEW OF ROLE INNOVATION

When studying role innovation, the critical question is: Why would an employee role innovate? Why would an employee expend extra effort, thought and time in order to change his or her work role when no formal reward was attached? This study does not presume to account for all sources of motivation for role innovation. Undiscussed, additional motivations for role innovation might include avoiding task interaction with poor performers (Farr & Ford, 1990; West, 1987b), minimizing interpersonal conflict and desiring to implement a new technology or technique.

However, much of the literature on role innovation focused on issues of poor task design and altering the method of accomplishing tasks. Therefore, I will discuss most of the literature by linking it to the concept of task frustration. Task frustration occurs when a worker experiences distress about performing the tasks of his or her job. Task frustration can be caused by poorly defined tasks, outdated procedures, time-consuming interactions, blockages toward goals and many other circumstances. All of these task frustrations could encourage a worker to role innovate. By role innovating, the worker would hope to reduce frustration and improve his or her job situation. Since I am focusing on role innovation in the workplace, task frustration is a major theme in this paper and in the role innovation literature.

Poor job design can quite easily lead to task frustration. Many existing jobs were not developed using formal job design techniques. On the contrary, jobs often develop and stabilize for arbitrary reasons (Ilgen & Hollenbeck, 1991). Since little planning occurred, jobs often have unproductive idiosyncrasies and illogical processes or demands.

Even jobs that originally received job design planning exist in a business environment with rapidly changing demands (Kiernan, 1993). The job design often does not keep pace with the changing demands. Consequently, most jobs have some poorly designed, unmotivating features (Hackman & Oldham, 1980). Logically, the person best qualified to recognize frustrating problems is the person closest to them - the employee.

Changing task design was the primary focus of some of the first research done on role innovation (West, 1987b). West (1987b) conducted a longitudinal field study of 1700 male and female British managers to measure changes in work-roles and outcomes such as satisfaction and personal change. West (1987b) sent the managers a survey that asked them to indicate how differently they perform the job than the previous job holder did. This study found a positive correlation between role innovation and satisfaction and also with personal change. However, the key fact here is that West (1987a) perceived role innovation essentially as 'making a change to a task' and divided it into six categories of behavior. The six role innovation categories were: (1) Setting new work targets/ objectives; (2) Deciding the methods used to achieve work targets/ objectives; (3) Deciding the order in which different parts of the job are done; (4) Choosing whom you work with in order to carry out your work duties; (5) Initiating new procedures or information systems; (6) Developing innovative ways of accomplishing targets/ objectives (West, 1987a).

West (1987a) found strong reliability and validity for the measure of role innovation containing these six behaviors. This work contributed significantly to the role innovation literature by defining task change behaviors and providing a measure.

However, the self-report surveys assessed role innovation by comparing the current employee with the previous job holder (West, 1987b). My conceptualization of role innovation considers it as a personal process in which the employee changes his or her own role. Of course, the personal change occurs within a social context, so the impact on co-workers must be considered. Since I define role innovation to be task-focused, task frustration should encourage an employee to role innovate. Following many traditional models, I believe that task frustration is a major catalyst of role innovation.

Staw & Boettger (1990) researched a task-focused construct called task revision, under the construct of counter-role behavior, that has many similarities to role innovation. "Counter-role" behavior was defined as behavior that differs from expectations (Staw & Boettger, 1990). Counter-role behavior included a range of actions including deviance, dissent, role innovation and task revision. Each of these behaviors can be appropriate in certain situations. The researchers indicated that when a role is incorrectly specified, then counter-role behavior (role innovation/ task revision) can result in excellent performance (Staw & Boettger, 1990). Role innovation was used by employees to fix a frustrating task and improve their performance. This is another example of the link between role innovation and task frustration.

Staw & Boettger (1990) defined the construct of task revision as, "...taking action to correct a faulty procedure, inaccurate job description, or dysfunctional role expectation." (537) This definition of task revision captures the task-focus of my role innovation definition, but does not explicitly encompass the social element. Staw & Boettger (1990) tested their task revision construct in two laboratory studies. They used a

communications officer exercise in which subjects were instructed to re-write a recruiting brochure with differing types and sources of information. The first study indicated that subjects did more task revision when alternative solutions were highly salient and when goals were general rather than specific (Staw & Boettger, 1990).

In the second study, the researchers delved deeper into their finding that specific goals, such as those advocated by the goal setting literature (e.g. Locke & Latham, 1990), can operate as a control mechanism to suppress useful forms of counter-role behavior (Staw & Boettger, 1990). They supported their previous findings in that specific goals only encouraged revisions in the target areas whereas 'do your best' goals encouraged revisions in all areas. One of the general findings of the research was that there was a low base rate of task revision, and control mechanisms such as goal setting and conformity, to norms restricted it even further (Staw & Boettger, 1990).

Along with task frustration concepts, other reasons for role innovation have been investigated. Role innovation can occur with individuals who wish to have more control over their tasks (West & Rushton, 1989). Higher need for control has been associated with higher self-reports of role innovation (West & Rushton, 1989). Need for control is affected by the amount of discretion in the role. Low discretion roles offer fewer opportunities for the employee to change the role, whereas some high discretion roles almost demand it (Nicholson, 1984). West and Rushton (1989) studied 145 student nurses in a low discretion atmosphere. The low discretion atmosphere did limit role innovation and forced the student nurses to adapt to the environment through personal change (West & Rushton, 1989).

Some of the earliest research investigated the effects of different socialization practices on role innovation. Schein (1968) defined organizational socialization as "the process of 'learning the ropes', the process of being indoctrinated and trained, the process of being taught what is important in an organization..." (p. 2) Van Maanen and Schein (1979) described six structural dimensions of the socialization setting which could foster either conformity or innovation. Each dimension has two polar organizational strategies for socializing newcomers. The six dimensions are: formal-informal, individual-collective, serial-disjunctive, investiture-divestiture, sequential-non-sequential and fixed-variable (Van Maanen & Schein, 1979). An organization can influence the development of it's workers by choosing to use different combinations of these strategies. For example, a socialization process which is individual, informal, disjunctive and involves investiture processes might lead to more innovative behavior. Jones (1986) found that an "institutionalized strategy" consisting of a collective-formal-sequential pattern does lead to poor affective adjustment and less innovative behavior than the individualized approach. A recent empirical study also found that institutionalized socialization (collective, formal, sequential, fixed, serial) led to less attempted and less actual role innovation (Ashforth & Saks, 1996).

The role innovation literature is in its infancy. Researchers are struggling with the boundaries and definition of the construct. Most of the empirical research on role innovation has treated it as one of many outcomes and has not focused on role innovation as a process of its own. This studied investigated two organizational factors expected to influence role innovation as well as investigating the process of role innovation.

ORGANIZATIONAL FACTORS

Using the construct definition of role innovation and the existing literature, this study tried to address two research questions. The first question was: Will the organizational factors of climate for innovation and goal focus (group versus individual goals) affect role innovation?

Climate for Innovation

Organizations differ on the amount of pressure for conformity or for innovation that employees face in the workplace. Although role episodes occur between members of the workgroup, the climate of the organization affects the freedom of these relationships. Climate is often viewed as a mediator between the organizational context and individual response (Kozlowski & Hults, 1987; James & Jones, 1974). Climate links the organization and individual by relaying the norms and expectations of the organization.

Climate at the individual level refers to the person's cognitive interpretation of the organizational situation and has been labeled "psychological climate" (James, James, & Ashe, 1990). Employees use information provided by the psychological climate to determine what behaviors are acceptable and gauge the possible outcomes of actions (Scott & Bruce, 1994). Organizational climate encompasses situational characteristics such as context, structure and processes. The important feature of organizational climate is that it is built through consensus of individual's psychological climate. The consensual nature of organizational climate provides a basis for collective responses (Kozlowski & Hults, 1987). Organizational climate provides a framework for considering motivation at a collective level (Kozlowski & Hults, 1987).

Some organizations have a climate that encourages innovation and which should also encourage role innovation. Climate is a broadly-defined term that does not allow easy conceptualization. It is critical to define the dimension (i.e. climate for safety) that is being studied by the climate measure (Kozlowski & Hults, 1987; Schneider, 1985). This study focused specifically on the climate for innovation.

The climate for innovation has a strong influence on innovative behavior (Kozlowski & Hults; 1987; Kanter, 1983). Kanter (1983) noted that innovative companies have a 'culture of pride, climate of success'. Past research concerning technical innovation and updating indicated that climate can either facilitate or discourage innovative behavior, updating activities and job performance (Kozlowski & Hults, 1987). Without a supportive climate, role innovation becomes an employee's struggle against the organization to make desired changes. In an empirical study of innovation, Scott & Bruce (1994) found a significant correlation between innovative behavior and support for innovation within a research and development laboratory.

Organizations with a climate for innovation create a norm for innovation. Burningham and West (1995) conducted a study to measure predictors of team-level innovation using a sample of oil company workers in the United Kingdom. They determined that support for innovation was one of the principle predictors of group innovation. Other predictors included vision, participative safety and task orientation (Burningham & West, 1995). West (1990) distinguished between articulated and enacted support for innovation. The support included verbal support, cooperation and providing time and resources (West, 1990). Companies must do more than say they support

innovation. They must provide support, resources and encouragement for it. The importance of climate for innovation also applies to role innovation. Employees must feel that change and variation are acceptable within the organization. Organizational norms that encourage change may even encourage members to role innovate in order to be culturally appropriate (Farr & Ford, 1990).

Goal Focus

In addition to climate for innovation, goal focus is an organizational factor that should influence role innovation. In this study, goal focus distinguished between group level goals and individual level goals. Organizations institute a goal focus among workers either by setting individual goals and rewards or by setting group goals and rewards. This study's role innovation definition emphasized both individual task elements and social interaction, and these two distinct aspects of the role innovation definition are partially captured in the dichotomy between individual and group goals. This makes goal focus a uniquely suited context for considering different influences on role innovation. From a task perspective, goals can help focus worker's attention on different job elements (Locke, Durham, Poon & Weldon, in press) and may impact role innovation of job tasks. From a social perspective, group goals inherently have a stronger social element than individual goals.

Before considering the impact of goal focus on role innovation, it is important to consider the current goal literature. Most of the current goal literature focuses on goal-setting tactics and processes. This section should show that goals are important to

performance and that group and individual goals have different impacts on outcomes especially for interdependent tasks.

Considerable work has been done on goals and goal setting in the past decade (see Locke & Latham, 1990 for a discussion). The relationship between goals and performance has been found in many studies which indicates the importance of goals for organizations. Much of this research has focused on goal-setting (Latham & Locke, 1991) which examines the specificity and difficulty of goals as well as the process for setting the goals and following up on them. The main findings of this goal-setting research include: (1) specific, difficult goals lead to higher levels of task performance than "do your best" goals; (2) feedback strengthens the goal-performance relationship; (3) goals impact performance most when commitment to the goal exists; (4) assigned goals are just as effective as participatively set goals if a rationale is given for the goal; (5) self-efficacy effects performance and goal setting (Locke et al., in press).

Although this goal-setting research has contributed significantly to the goal literature, it does have its limitations. Two limitations are that most of the research has been conducted at the individual level and most of the research has been done using independent tasks (Locke et al., in press). It is important to begin conducting more goal studies involving group goals and interdependent tasks. Increased teamwork and interdependence in today's organizations create a need for group level goals. The individual goal-setting literature provides a starting place for research on group goals. However, group and individual level goals should encourage different types of behavior especially with interdependent tasks. The need for group-level research is seen by the

increased use of groups and teams by American organizations. The last decade has seen a shift in organizational structure in the United States to more group-level work and task interdependence. Many organizations today are stressing teamwork, groups and cooperation in the workplace (Guzzo & Shea, 1992; Wagner, 1995; Shamir, 1990, O'Leary-Kelly, Martucchio & Frink, 1994).

Interdependent tasks, such as those faced by most teams, require a different type of goal setting than that of individual, independent tasks. However, the distinction between independent and interdependent tasks and workgroups has not always been clear. Before researching group goals, it is important to decide what type of interdependence the group will have. In the research, the definition of interdependent workgroups has varied (Kernan, Bruning & Miller-Guhde, 1994). In one interdependent task study, participants worked together on group goals but were not allowed to communicate (Mitchell & Silver, 1990). In another study (Weldon & Weingardt, 1988), participants were allowed to communicate and individual contributions and interaction remained anonymous. Mitchell and Silver (1990) made a further distinction between goal interdependence and task interdependence. They described goal interdependence as group members sharing a common goal whether or not they actually work together. Task interdependence occurs when group member must work together to accomplish a group goal. In order to reflect the reality of most groups in organizations, interdependent tasks should have group member interaction and communication (Kernan et al., 1994). This type of interdependent task creates a perfect opportunity to study group level goals. All member of the group should have an investment in the task and goal.

Although less research has been done on group-level goal setting, some progress has been made. Preliminary results indicate that group goals can improve performance on interdependent tasks (Weldon & Weingardt, 1988). Consistent with individual goal setting, studies have shown that groups perform better when they have specific, difficult goals (Weingardt & Weldon, 1991; Locke et al., in press). A meta-analysis that included 26 effect sizes from 10 studies supports the idea that groups with goals perform better than groups without goals (O'Leary-Kelly et al., 1994). Further research indicates that the relationship between group goals and performance is influenced by several variables such as task complexity, group member effort and planning (Weingardt, 1992).

Most of the goal research has focused on goal setting and related issues. Few studies have examined the differential impact of individual versus group goals. However, Mitchell and Silver (1990) examined the interaction between group and individual goals. They found that group goals plus individual goals resulted in high performance on interdependent tasks. However, group goals worked as well as group plus individual goals and both performed better than individual goals. They concluded that individual goals can cause competitive feelings and behavior which can lower performance on an interdependent task (Mitchell & Silver, 1990).

In summary, this section has shown that goals are important to performance. Significant amounts of research have shown the optimal way to design and set individual-level goals. Some of this research has also been translated to work with group-level goals. However, the critical point is that individual and group levels goals should cause people to behave differently. This difference should occur as people with individual

goals should focus primarily on the individual aspect of the task and give only secondary attention to the group-level, interdependent aspect of the task. People with group level goals should focus on the group-level goal but also complete individual tasks since they are necessary to the group-level task.

Since goals affect behavior, they should effect role innovation as well. People given group goals should focus on the group task. If the task is interdependent, people with group goals should be more likely to discuss issues with other group members and to seek solutions to group problems. They would be more likely to make role innovations that improve the task for the group as well as for themselves. However, with an individual goal, people working on interdependent tasks might only role innovate to help themselves and not in order to benefit the group. For interdependent tasks, group goals are likely to encourage more role innovation, since changes could be made to individual as well as group elements of the task.

PROCESS OF ROLE INNOVATION

The second research question is: How do HMX and role negotiation contribute to the role innovation process in interdependent workgroups? This process reflects the social nature of role innovation - other workers should be (but sometimes are not) considered and consulted when a worker makes a task change, especially on an interdependent task. Besides role negotiation, the process of role innovation involves other steps. The first process step occurs when the worker solves the problem and proposes the role innovation idea.

In order to role innovate, the employee must be able to devise a solution for the task frustration that he or she has encountered. The problem solving step in role innovation should be rather simple. All problem solving situations require some ability, but the solutions to most role innovation problems should be fairly obvious (Farr & Ford, 1990). Some researchers (Staw & Boettger, 1990) even believe that role "innovation" is somewhat of a misnomer, since the appropriate behavior is rather obvious and does not always require much creativity. Farr & Ford (1990) recognized that the innovative aspect of role innovation must be considered on a continuous scale. The 'newer' and 'more useful' that the change is; the more innovative it can be considered. Since role innovation solutions are often obvious, most individuals should be capable of initiating them (Farr & Ford, 1990). Other researchers would add that all creativity and innovation result more from hard work than from creative genius (Staw, 1990).

Usually one worker will decide to role innovate and devise a solution. However, the new idea or behavior usually has implications for all members of the workgroup -

especially when an interdependent task is involved. The social nature of role innovation indicates that discussion should accompany proposed changes, since most changes will directly or indirectly impact the entire workgroup. The success of this negotiation depends heavily on the quality of the relationship between the initiator and the others in the workgroup. Role innovation moves from being one worker's idea to being a discussion and negotiation point for the group. The discussion functions as both a "reality check" that keeps changes within organizational norms and a time for the role innovator to persuade others in the workgroup to accept the change.

Negotiation is important since workgroup members are dependent on one another on the job. When jobs are highly interdependent, related activities should be considered before role innovation occurs (Farr & Ford, 1990). Part of the negotiation phase must include support for good ideas and the winnowing of weak ideas (Staw, 1990). In some organizations, proposed ideas must have 'idea champions' that support and promote the idea in order to make it a reality (Kanter, 1983). At the role innovation level, the idea champion would be the role innovator. The key point to remember here is that role innovators usually face some level of opposition, but they must be willing to persevere to get the change implemented (Staw & Boettger, 1990). If the workgroup disputes a proposed role innovation, the employee must decide whether their arguments are valid or not. This decision will help him or her decide whether or not to proceed with the role innovation. The entire negotiation process depends on the relationships that the role innovator has with the workgroup. One way to study the process of role negotiation is to examine the quality of the relationship between the role innovator and workgroup. Role

innovators with positive relationships should have more success in implementing ideas. Members with poor relationships should experience difficulty during the negotiation phase and therefore be less likely to implement their proposed role innovation.

In recent years, researchers have studied relationship quality between workgroup members by using leader-member exchange (LMX; Graen & Scandura, 1987) and team-member exchange (TMX; Seers, 1989). Building on this research, Nason (1995) developed a new construct called horizontal member exchange (HMX) to study the quality of relationship between same-level workgroup members.

LMX and TMX

Recent research indicates that the quality of a role relationship can be defined and measured through leader-member exchange (Graen & Scandura, 1987) and team-member exchange (Seers, 1989). These theories provide an explanation for the potential success and failure of role negotiation attempts. Leader-member exchange (LMX) is a theory that applies role theory to the relationship between supervisors and subordinates. LMX involves the negotiation process which affects the quality of working relationships (Nason, 1995). Leaders exchange resources (i.e. information, assignment, support) with subordinates in order to elicit desired behavior. This exchange process creates a unique relationship between the leader and each subordinate (Dansereau, Graen & Haga, 1975). Subordinates with positive LMX relationships become part of the leader's in-group (preferred members) and receive special attention and responsibilities. Leaders often ask in-group members to perform coveted extra duties that the leader does not have time to

perform (Nason, 1995). On the other hand, leaders usually ask out-group members to perform only the routine tasks contained in the accepted job description (Nason, 1995).

Graen and Scandura (1987) added a role routinization stage to the Katz and Kahn role theory. In the role routinization stage, the LMX interactions become predictable and follow an ordered sequence (Graen and Scandura, 1987). Role innovation would cause a disruption of the role routinization stage as the employee pushes to re-negotiate the role. Early research measured LMX by considering the amount of negotiating latitude that the subordinate had in defining the role (Nason, 1995). Out-group members did not possess much influence with the leader, so their negotiating latitude was low. This low negotiating latitude limited the subordinate's ability to affect his or her role with the leader. In-group members had high negotiating latitude and therefore had more power to define their role with the leader. It is important to note that out-group members may have to be more assertive in order to obtain desired behaviors (Nason, 1995).

Seers (1989) developed the team-member exchange (TMX) construct based on the concept of LMX. TMX does not reflect a dyadic relationship such as that between a supervisor and subordinate. It states that the entire peer group transmits role expectations to the focal team member (Nason, 1995). TMX captures the quality of the relationship between the target member and the rest of the peer group. TMX reflects the relationship between peers with relatively equal status, so the exchange processes should be more balanced (Seers, 1989). It measures the peer group perceptions of the target member's willingness to help and share with other members (Seers, 1989) This same level of information-sharing, help and recognition should also be sent to the target member from

the peers. This type of information sharing and support affects the effectiveness of the member's working relationship with the peer group (Seers, 1989).

An empirical study by Seers (1989) indicated that TMX had differential validity from LMX and that TMX accounted for significant proportions of variance in work, co-worker and general satisfaction beyond the LMX construct (Nason, 1995). The research also showed that the quality of the member's relationship with the peer group accounted for variance in the supervisor's rating of individual performance (Seers, 1989). Nason (1995) stressed that role behavior serves as the primary currency of team-member exchange. Interdependent team members rely on compliant role behavior in order to accomplish their tasks (Nason, 1995). One major limitation of TMX is that it departs from the traditional dyadic framework of role theory to explore the group interaction (Nason, 1995). This limitation impairs the ability to understand team member role behavior and attitudes in the traditional role theory context (Nason, 1995).

Researchers have considered the effect of LMX and TMX on innovative behavior. Scott & Bruce (1994) found that LMX accounted for 39% of the variance in support for innovation through a LISREL goodness-of-fit measure, but they did not find a significant correlation between TMX and innovative behavior. The non-significant TMX results may be due to conceptual problems, since TMX does not reflect a true role relationship. It is based on an average relationship between a focal member and his or her peers (Nason, 1995).

Horizontal Team Member Exchange (HMX)

In response to the limitations inherent in TMX, Nason (1995) developed a new role relationship measure called horizontal team member exchange (HMX) to study dyadic relationships between team-members. These horizontal relationships differ between team-members and can affect team and individual level outcomes (Nason, 1995). HMX has an advantage over TMX in that it follows the traditional boundaries of role theory (Nason, 1995). HMX relationships develop with the same cycle of sending, receiving and responding to role expectations detailed by Katz and Kahn (1978). Since HMX defines the relationship between two people, it retains within-group variance (Nason, 1995). TMX loses much of the within-group variance by aggregating all responses to a peer group level.

Through LMX, leaders have the opportunity to offer institutional rewards (pay, raises, responsibility, information, etc.) in the exchange relationship. HMX relies on cooperation as the exchange currency for the relationship (Nason, 1995). This permits a very balanced exchange situation. HMX is appropriate for considering team relationships, since all members rely on each other to complete an interdependent task - the leader does not necessarily have extra power at the task-level. Cooperation is essential when teams are performing interdependent tasks (Nason, 1995). Although HMX affects the interaction of dyads, the quality of HMX is defined and measured at the individual level (Nason, 1995). The exchange relationship quality "...is an individual-level perception of the quality of a working relationship that develops over a series of dyadic interactions (Nason, 1995 p.41). Nason's (1995) model of HMX shows that team

members indicate their perception of the relationship quality through their communication behaviors.

In summary, HMX provides a means of measuring the quality of the relationship between same-level workgroup members. Since workgroup members work interdependently, their exchange currency is cooperation. Members with better HMX relationships would have more negotiating power for implementing a role innovation than a member with a poor relationship. HMX provides a method for capturing the role negotiation process.

Role Negotiation

HMX provides a good measure of the interaction between co-workers. It can help determine which workers have the high quality relationship necessary to initiate a role innovation. But HMX just gauges the quality of the relationships. It is also critical to consider the actual role negotiation behavior. The process of role negotiation would probably start with the individual presenting the role innovation idea to the workgroup (or some sub-set of the workgroup). After the presentation, the workgroup would discuss the idea in either a formal or informal format. The workgroup would need to consider the impact of the changes on all inter-related tasks or relationships (Farr & Ford, 1990). Final approval decision or rejection of the idea could be made by the group as a whole or by the supervisor. Depending on the situation and the complexity of the change, this process could take minutes, days or longer. The proposed model assumes that the role innovation process begins after a role has been established through the original role making process described by Katz and Kahn (1978). The negotiation that occurs during

the role innovation process is intended to revise the existing role. HMX gauges the quality of the relationships between co-workers and role negotiation refers to the actual discussion behavior that occurs between co-workers.

Although LMX and TMX indicate that some people will be more successful than others at role innovation, the whole issue can be avoided by bypassing the role negotiation stage. Some employees will not consider or consult the workgroup when making a change. This decision might be acceptable if the employee is working in an autonomous position, but interdependent jobs could easily suffer from undiscussed role innovation (Farr & Ford, 1990). By bypassing the scrutiny of workgroup and organizational norms, the employee's un-negotiated role innovation can resemble rebellion (Van Maanen & Schein, 1979). If the employee initiates a role innovation that negatively impacts the workgroup, then serious problems could arise. For example, some role innovations require adjustments by other workgroup members. By not allowing these adjustments, the role innovator could cause confusion and performance problems for the workgroup. Role negotiation should be a critical part of the role negotiation process for interdependent tasks.

RESEARCH MODEL AND HYPOTHESES

Very little empirical research exists on role innovation. As a whole, the topic has not received much attention. Lack of a solid construct definition and research methodology has hindered work in the area. This paper presented a construct definition of role innovation which provided boundaries and guidelines for research and will now present the conceptual model of the influences and process of role innovation (see Figure 1). This model incorporates the organizational variables, HMX and role negotiation discussed in previous sections and also introduces several individual difference variables that might influence role innovation. The model assumes that the role innovation process has been initiated by a catalyst such as task frustration. The model starts with the influence of organizational factors and ends with improved task performance. (See Figure 3 at the end of this section for the model marked with hypotheses).

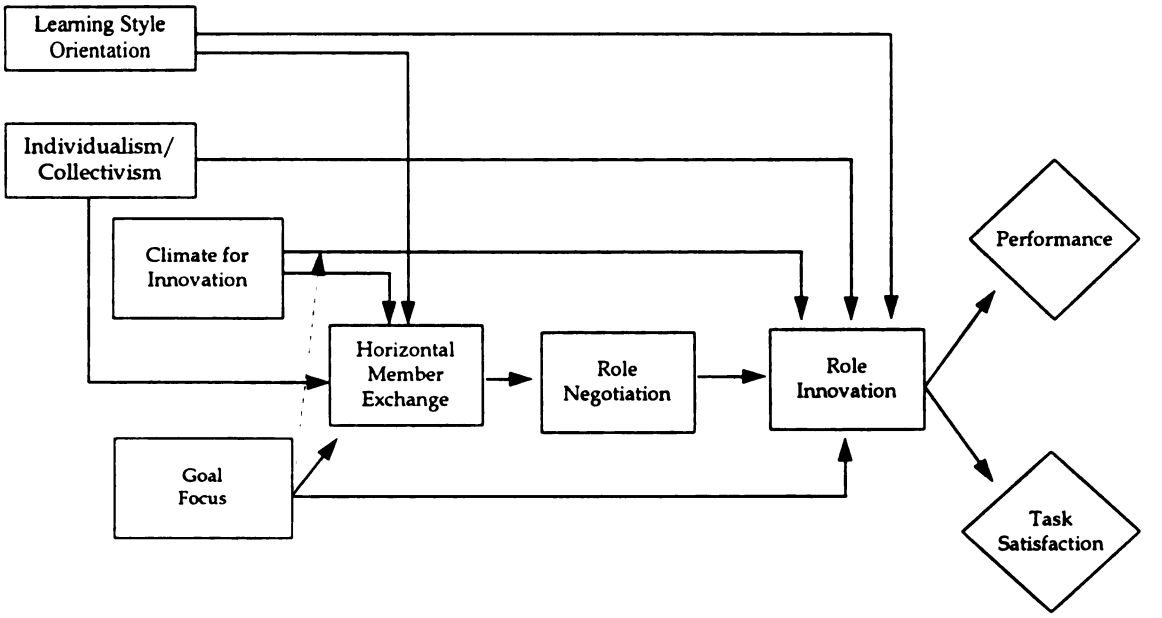


Figure 1: Model of Role Innovation

After the role innovation process is initiated (often with task frustration as a catalyst), the organizational factors of climate for innovation and goal focus should have an effect. Climate for innovation indicates whether or not a workplace will support, encourage and accept role innovations. Goal focus indicates whether or not the organization encourages cooperation and teamwork which affects the social and negotiation aspects of role innovation. When a role innovation idea survives the organizational factors, the model predicts that the worker will negotiate the proposed change with other workgroup members. This is an important process step, especially when workgroups and tasks are highly interdependent. This negotiation is dependent on the quality of the relationship (HMX) between the workers. After negotiation, the role innovation is implemented. Assuming that the role innovation corrected a flaw in the task, performance on the task should improve. Specific hypotheses will be developed for each of these ideas.

Climate for Innovation

In the discussion of climate, I argued that climate for innovation has a strong influence on innovation. Climate relates the norms and values of the organization to individual workers. Climate indicates what behaviors or types of behaviors are acceptable. This impact of climate on innovation should also extend to role innovation. Role innovators face issues of introducing a change into an organizational context, and some organizations will support a worker's role innovation and appreciate the proactive job involvement. Other organizations might perceive role innovation as a threat to the status quo and attempt to block or discourage it. Role innovation is a grassroots, personal

action initiated by the individual. However, all individuals function within organizations that affect their behavior and decisions. Therefore it is expected that climate for innovation will affect role innovation.

Hypothesis 1: Participants in a climate that supports innovation will engage in more role innovation than participants in a climate that does not support innovation.

Goal Focus

My construct definition stresses both the task-focus and social nature of role innovation and goals incorporate both of these elements. As for the task focus, goals have been shown to focus attention on tasks and generate higher performance (Locke et al., in press). Although the social element is a critical part of all roles and role innovation, most earlier researchers did not recognize the social element. The importance of the social elements might be investigated by considering the differential impact of group and individual goals. Research has concluded that individual goals can create competition and detriment performance on interdependent tasks (Mitchell & Silver, 1990). This competitive feeling should cause people to focus only on their own situation and not the social situation. Therefore, workers with individual goals are expected to only role innovate their own specific task and not consider the group needs.

Group goals focus participants on the shared task and should encourage cooperation which should improve performance on interdependent tasks. This interdependence and cooperation should stimulate more role innovation. Workers will have an opportunity to role innovate their own tasks as well as role innovate the group

tasks. Group goals expand the scope for role innovation which should encourage more overall role innovation.

Hypothesis 2: Participants with group goals should role innovate more on the interdependent task than participants with individual goals.

Interaction between Climate and Goal

It is expected that a climate supporting innovation and group goals will result in more role innovation. However, it is also possible that the interaction between climate and focus can affect these findings. This difference is expected to occur due to the control systems inherent in groups. Specifically, groups have considerable power for keeping members within the norms and standards of the group. If climate for innovation can act as a group norm, then groups might expect members to behave in the manner suggested by the climate. This group norm effect is expected to be much stronger in groups assigned group goals.

It is a well-researched fact that groups exert affective and behavioral control over individual group members (see Hackman, 1992 for a discussion). Groups often strive for uniformity among members. This uniformity can be created through socialization (see Fisher, 1986 for review) and through on-going pressure and norms (Hackman, 1992). Role constraints and standard operating procedures can also stifle variation (Brett, 1984). Uniformity can help a group to run smoothly and with minimal conflict (Hackman, 1992). However, the power of group conformity can have negative effects as well. Janis (1982) coined the term "groupthink" to describe how the pressure to conform can keep individuals from voicing critical dissenting opinions. Janis (1982) cited the disastrous

Bay of Pigs decision during the Kennedy administration as an example. In that case, dissension was discouraged during planning meetings and critical objections were never presented (Hackman, 1992).

A classic study by Asch (1951) demonstrated the power of the group to cause individual conformity. In this study, subjects had the simple task of matching the length of a line to one of three presented lines. Subjects had to state their opinion out loud in a roomful of confederate subjects. The subject was often faced with a unanimous majority of "peers" who were all giving the incorrect answer. Approximately one third of the real subjects chose the obviously wrong answer in order to agree with the majority (Hackman, 1992). All of this research demonstrates the power of the group to keep the individual from deviating from the norms or standards. These powerful group norms could have an added impact on the groups with group-level goals.

The research shows that groups create norms which affect the behavior of individuals. However, these norms can affect a variety of behavior. For example, if the organization had a climate for innovation, the group might make innovative behavior a norm. The group might pressure individuals to conform to the norm and encourage creativity, innovation and change. The power of group conformity would be to encourage change instead of maintaining the status quo. Some organizations, such as 3M, do have a climate that support innovation and actively encourage and reward the creativity of employees (Kanter, 1983). Farr and Ford (1990) described this as a norm for innovation. With a norm for innovation, members would role innovate in order to be culturally appropriate. If climate is treated as a norm, it should have a stronger impact on

workers with group level goals. This could create an interesting interaction between the two variables.

As Figure 2 shows, participants with group goals are expected to role innovate less than participants with individual goals when in the traditional setting. However, participants with group goals are expected to role innovate more than participants with individual goals in the innovative climate. This interaction is expected due to the extra control power of group norms among the group goal participants. Workers with group goals would move toward the innovative or traditional norms established by the climate. This would create more extreme changes in role innovative behavior for workers with group goals depending on climate.

Hypothesis 3: Climate for innovation and goal focus should interact. In a climate supporting innovation, participants with group level goals are expected to engage in more role innovation than participants with individual level goals. In a climate that does not support innovation, participants with group level goals are expected to do less role innovation than participants with an individual level goal.

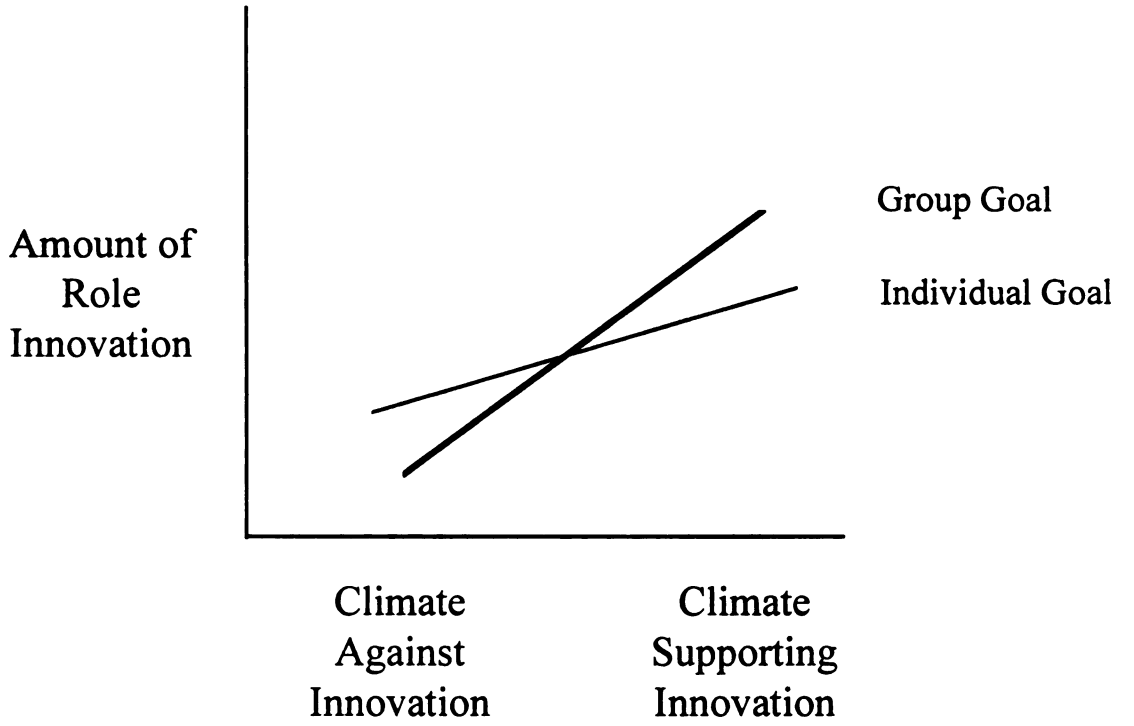


Figure 2: Interaction of Climate and Goal Focus

HMX

As the use of teams and workgroups increases, workers are often finding themselves working on interdependent tasks. This interdependence means that the behavior of one worker will often affect the work of the others in the workgroup. Role innovation occurs within these interdependent situation as is seen by the social element within the construct definition. One method of studying this social element is by considering the quality of the relationship between co-workers. Quality of the relationships can be conceptualized by using horizontal team member exchange (HMX).

Organizational climate should have an impact on HMX, since some organization will encourage help and positive interaction and others will discourage it. Innovative organizations should encourage teamwork and positive interaction. They are more likely to want employees to work together to solve problems and reach the goals of the organization.

Hypothesis 4: Participants in innovative organizations should have better quality relationships (higher HMX scores) than participants in traditional organizations.

HMX impacts the negotiation and decision making, since workers with higher quality relationships and more negotiating power are more likely to find approval for their ideas. Workers with group goals have more incentive to interact, so they should develop better quality relationships. Individual goals have been shown to foster competitive feelings which would lead to poorer quality relationships.

Hypothesis 5: Participants with group goals should have better quality relationships (higher HMX scores) than participants with individual goals.

People with higher quality relationships should be more likely to actually discuss issues with their workgroup. They are more certain of being received well and having their ideas supported. This discussion refers to the actual role negotiation behavior.

Hypothesis 6: Participants with higher HMX scores should role negotiate more than participants with lower HMX scores.

Role Negotiation

When the task is interdependent, a role innovator should discuss and justify a potential change to the other workers. If they agree to the change, the other workers may have to role innovate themselves in order to accommodate the change. Role negotiation can be studied by documenting the amount of discussion or actual role negotiation behavior occurs. Workers with group goals have more opportunity to interact and therefore have more opportunity to discuss issues.

With an interdependent task, people have more opportunity to work together as well as do their own work. This opens up additional opportunities for role innovation. The worker can change their own task as well as change the group task or interaction.

Hypothesis 7: Participants who do more role negotiation should role innovate more than participants who do less role negotiation.

Performance

The final outcomes for the model indicate that task performance should improve after role innovation. This is based on the idea that frustrating tasks are often caused by poor design. When the design is changed (hopefully improved) the employee should encounter fewer roadblocks and therefore perform better. Staw & Boettger (1990) did

indicate that when a role is incorrectly specified, counter-role behavior (i.e. role innovation/ task revision) can result in excellent performance.

Hypothesis 8: Participants who role innovate more on the task should perform better on the task than participants who role innovate less.

Task Satisfaction

If the employee has role innovated a task to suit his or her needs, then the worker should find the changed task to be more satisfying. This is expected to occur if the role innovation process was successful and the new behavior improved the task. The participant has taken control of improving his or her task by role innovating. People who do not role innovate are likely to still be frustrated by the task

Hypothesis 9: Participants who role innovate more should report more task satisfaction than participants who role innovate less.

Individual Differences: Role innovation has been conceptualized in this study as a job holder proactively changing his or her job without direct orders from the organization. Not all people in all situations will be able to role innovate. The main focus of this study was to examine the process and the organizational factors that encourage or discourage role innovation. However, common sense indicates that some people may be naturally more inclined to role innovate than other people. This study explored two individual difference variables that seemed like they might relate to role innovation. The individual differences will deal with two important aspects of role innovation: interaction with other people (individualism-collectivism) and approach to learning the task (mastery versus performance learning style).

Individualism-Collectivism

The first individual difference variable, individualism-collectivism, focuses on the social aspect of role innovation and determines how people interact with others. This could distinguish between people who like to work in groups and people who do not like to work in groups. Individualism-collectivism has many applications in the field of psychology. The tendency toward having an individual or collective orientation often depends on the person's culture (Wagner, 1995), organizational climate and specific task goals and rewards. An individual's personal orientation could influence his or her tendency to role innovate. Role innovation incorporates some individualistic aspects and some collectivist aspects.

Individualism-collectivism is often studied at a cultural level. This cross-cultural research often compares the general tendency of citizens to approach the world with a collective or individualistic viewpoint (see Wagner, 1995 for a review). Some cultures such as the United States and Australia tend to instill individualism in people while countries such as Japan and China tend to encourage collectivism (Wagner, 1995). These cultural values are instilled in people and become ingrained behavioral patterns. However, individualism and collectivism can vary at an individual level, since people adopt different cultural attitudes and vary on basic tendencies.

Many current organizational theories stress individualism. (Wagner, 1995) Wagner and Moch (1986) define individualism as the condition in which personal interests are accorded greater importance than are the needs of groups. A certain level of individualism is required for role innovation, because the employee must be concerned

about his or her situation and engaged enough by the task to make a change when necessary. The construct definition of role innovation provided in this paper encouraged individualistic tendencies. The definition stressed the point that role innovation focuses on the employee's own task and the employee is attempting to improve his or her own situation. The definition also indicated that the individual initiated the change, not the organization or group. When an employee role innovates, he or she is changing the status quo and claiming some autonomy in the organization. Hui and Villareal (1989) surveyed Chinese and American students and found that collectivism was negatively correlated with autonomy and positively correlated with need for affiliation.

However, the last decade has seen a shift in organizational structure in the United States to more team-based work groups and even to organizational interdependence. Some researchers even suggest that highly individualistic orientations may be inappropriate for contemporary organizations (Wagner & Moch, 1986). More organizations are stressing teamwork, groups and cooperation in the workplace (Guzzo & Shea, 1992; Wagner, 1995; Shamir, 1990). One method of fostering cooperation and teamwork within an organization is to instill a collective orientation among employees (Wagner, 1995). Wagner and Moch (1986) define collectivism as occurring when the demands and interests of groups take precedence over the desires and needs of individuals. Wagner (1995) conducted a study to determine the impact of a collective orientation on cooperation and teamwork. He monitored the progress of 492 students working to prepare a group presentation over a period of weeks. The students rated each other on a cooperation scale and completed a individualism-collectivism survey about

themselves. The results indicated that collectivists cooperated more on highly interdependent tasks than individualists did (Wagner, 1995). These results highlight the importance that collectivism can have on encouraging cooperation in today's team-based workplace.

Collectivism addresses two important features of role innovation. First, collectivism captures the social interaction nature of role innovation that is often overlooked by researchers. Second, it highlights the fact that role innovation must be negotiated with members of the role set. Collectivism and individualism both capture unique aspects of the construct definition of role innovation. With interdependent tasks, people with collectivist outlooks should focus on group goals. If people focus on group concerns, then the quality of their interaction should improve as reflected by HMX. This focus on group goals should also encourage more role negotiation and role innovation as workers try to improve their own tasks as well as the tasks of the entire workgroup. This focus on the group should encourage more group discussion (role negotiation) and more focus on improving group performance (role innovation).

Hypothesis 10: Participants with a collectivist outlook will have higher quality relationships (higher HMX scores) than participants with an individualistic outlook.

Hypothesis 11: Participants with a collectivist outlook will role innovate on the interdependent task more than participants with an individualistic outlook.

Learning Styles

Another important individual difference could be how the person perceives, approaches and learns the task. Mastery and performance learning orientations incorporate some of this difference. People with mastery orientations believe that effort leads to successful outcomes and that their ability for a task can be improved (Ames, 1992; Dweck, 1986). They engage in learning activities in order to understand the new task or concept and enjoy the challenge of learning. In contrast, people with performance orientations are less interested in learning the task and more interested in performing better than their comparison group. Performance oriented people believe that successful outcomes come from high ability and that their ability for a task is fixed and cannot be improved (Ames, 1992). Research has indicated that mastery and performance learning orientations are two conceptually and statistically separate dimensions (Button, Mathieu, Zajac, 1996).

Much of the research on learning orientations was conducted in classroom settings. These results indicated that classrooms emphasizing mastery goals encouraged students to use more effective learning strategies, prefer challenging tasks, approach the class more positively and believe that success follows from effort. Furthermore, mastery goals encouraged students to persist when faced with errors or difficulties. In contrast, classrooms emphasizing performance goals encouraged students to focus on their current ability level, evaluate their ability negatively, and attribute their failures to lack of ability. Performance oriented goals lead students to avoid challenging tasks and have less

persistence when dealing with difficulties (Ames & Archer, 1988; Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988).

In the classroom studies, learning orientations were usually manipulated as situational variables (Dweck, 1986). However, the learning orientations can also be considered individual differences. A recent paper classified learning orientation as, "...a somewhat stable individual difference variable that may be influenced by situational characteristics (Button, et al., 1996)." The dispositional learning orientation predisposes people to act a certain way, but the response patterns can also vary across situation. In this paper, learning orientation was treated as an individual difference.

Other research indicated that mastery orientation is related to the belief that success requires interest, effort , and collaboration (Duda & Nicholls, 1992). This indicated that mastery orientation could be related to HMX, since HMX is an indicator of relationship quality. People with mastery orientations should be more interested in working on the task and more likely to work well with their partners. In contrast, people with performance orientations might feel more competitive, show less collaboration with their partners, and not improve the HMX score after interacting. Consistent with previous research, performance orientation is not expected to have a significant relationship with HMX, but mastery orientation is expected to have a relationship.

Hypothesis 12: Mastery learning orientation will be positively related to HMX.

Other researchers have discussed the relevancy of learning orientations to role innovation (Farr, Hoffmann, & Ringenbach, 1993), however this link was not empirically tested. Their proposition was based on research that indicated that a mastery orientation

had caused people to accept more challenging tasks, persist when faced with difficulties, try to understand the task, and increase their level of competency (Ames, 1992; Dweck, 1986). Since people with mastery orientations are more engaged in the task and more interested in challenge, they were expected to role innovate more on the task. However, performance orientation was not expected to relate to role innovation, since people with performance orientation would only role innovate if it made them look good.

Hypothesis 13: Mastery learning orientation will be positively related to role innovation.

Overall Model

As noted earlier, this model presents role innovation as a process. The process should be affected by organizational variables (i.e. climate and goals) and individual differences (i.e. individualism/ collectivism and learning style). The model shows how quality of co-worker relationships (HMX) can influence the role negotiation for interdependent tasks. Therefore HMX and role negotiation both mediate the path to the primary dependent variable - role innovation. Role innovation was also predicted to lead to secondary outcomes of - performance improvement and task satisfaction. In this complex process model, several variables act as dependent variables as well as independent variables. The model itself essentially acts as an overall hypothesis concerning the expected role innovation process and relationships. The overall process model will be tested to see if the proposed model provides a good description of the relationships between the variables.

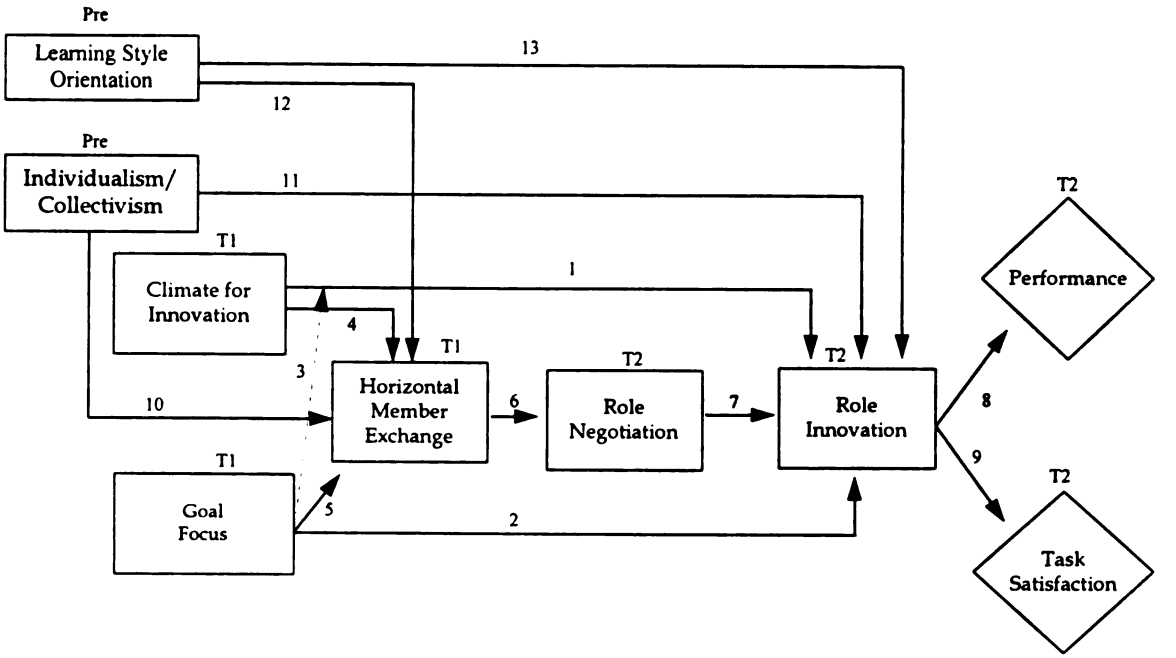


Figure 3: Model of Role Innovation with Hypotheses

METHOD

Participants

The participants were 232 undergraduate students from a large midwestern university who fulfilled a course requirement by being in the study. Four subjects (two dyads) were eliminated from the sample. For one dyad, a research assistant failed to collect all of the necessary scales. For the other dyad, one participant sat through the sessions but refused to perform the task. The final sample used in the analysis consisted of 228 participants with cell sample sizes ranging from 56 participants to 58 participants. Seventy-seven percent of the participants were female, and 54% of the participants were 19 years of age or under.

Design

This research project was designed to study some of the factors that influence role innovation. Participants took part in a manufacturing simulation that used Tinker Toys to approximate an assembly line. Participants used a standard operating procedure manual to build a specified product. The procedure presented for the task was designed to be frustrating and therefore encourage role innovation. The study investigated how two organizational factors, climate for innovation and goal focus, influenced the role innovation process. The design was a 2 x 2, between subjects fully crossed design that crossed climate for innovation and goal focus. Based on the conceptual model presented earlier, this study also incorporated role negotiation, HMX and three individual differences.

The first production session of the study provided the participants with an opportunity to learn the task. The second production session involved an unexpected change to the production schedule that was intended to make role innovation more salient to the participants. The production sessions were videotaped and later coded for pre-determined role innovation behaviors and role negotiation.

A preliminary power analysis was conducted (Cohen & Cohen, 1983) using pilot data to determine the sample size necessary to detect a moderate effect size with a power of .80 and a significance criterion of .05. The analysis was based on an R^2 of .30662 which was determined using pilot data that regressed five variables onto role innovation. The power analysis indicated that 144 participants were necessary to examine the hypotheses, so the final sample of 228 participants should have been sufficient.

However, the disappointing results indicated that power was lower than expected due to lower effect sizes. With correlations ranging from $r = .01$ to $r = .34$ ($N = 228$), the actual power ranged from less than .25 to .99. However, with the average correlation being about .10, the average power for the study was less than .50.

Rewards: In order to make the goals more salient, the participants had an opportunity to win money for good performance. The reward was designed to motivate the participants to pay attention and make a sincere effort at doing the task. It was mentioned at the beginning of the experiment, and a poster (unique to each goal condition) reminding participants of the reward was posted on the wall. The details of the reward are discussed in the goal manipulation section.

Change Memo: The change memo was designed to stimulate role innovation by increasing the pressure on the participants. The change memo was presented between the first and second sessions of the experiment. At the start of the second session, participants received a memo (see Appendix E) from the company headquarters. The memo demanded more production in the same amount of time. The new demands were designed to encourage role innovation as participants sought better procedures for meeting the new production requirements.

Task

The task was a laboratory-based manipulation that used Tinker Toy model building to approximate a two person work team (dyad) in a manufacturing situation. The task was consistent across all conditions. Participants received a manual that contained information about the organization, goals for the production session, standard operating procedures for doing the task and pictures of the components to be built. Participants within each dyad had different assignments (see Appendix C for the standard operating procedures) but had the same amount of work. Worker #1 built Component #1 which was the base of the final unit. Worker #2 built Component #2 which was the upper section of the final unit. Both workers contributed to the building of a smaller component (Component #3). When all three components were completed, the two workers built the final unit together by combining the three components. The task had independent elements (Component #1 and Component #2) and interdependent elements (Component #3 and final unit construction). However, even the independent elements required some

interaction. Each worker had a small task that he/ she was responsible for completing for the partner.

Although the tasks for the workers were different, each worker had an equivalent assignment determined by the number of Tinker Toy connections. One connection occurred every time that one Tinker Toy was attached to another Tinker Toy. For example, inserting a rod into a spool counted as one connection, and putting a spool on each end of a rod counted as two connections. Each participant built a component that consisted of the same number of connections. Although the components looked different, each participant's component required the same number of connections to complete. The participants completed the same task in production session one and two.

Manipulations

Climate for Innovation: Although the task remained the same, participants were assigned to a condition presenting one of two company profiles. One company profile presented a climate that supported innovation and one company profile presented a climate that was very traditional. The manipulation occurred through descriptions of different elements of the organization. The participants received a manual that described the organization, and the experimenter also read the description out loud. The company vision statement was also repeated between the two production sessions as part of the change memo. The two conditions differed on the following elements: company name, identification of the part being built, description of the type of employees that performed well at the organization, description of the employee of the month, and the company vision statement. The organization descriptions appear in Appendix A.

Goal Focus: The type of goal given to the participants was also manipulated, and participants received either individual or group goals. The procedure manual informed the participants about what components they must complete in order to perform well. Participants in the individual goal condition had a goal to produce as many individual components as possible, and participants in the group goal condition had a goal to produce as many units of the final unit as possible. The goal for the first 20 minute production session was presented in the manual (see Appendix B) and read out loud by the experimenter. The goal for the second session was presented through the change memo which was also read out loud. The goal for each condition was reinforced by goal posters on the wall. After the first session, participants completed a Progress Report which indicated how they were doing toward meeting the goal (See Appendix D).

As part of the design, a reward was possible for participants who performed well at the task. The reward differed depending on the goal condition. The five dyads that scored the highest in the group goal condition were entered in a random drawing for a $40 reward that was split equally between the two participants ($20 each). The five participants who scored the highest (regardless of the partner's performance) in the individual goal condition were entered in a random drawing for a $20 prize. The drawings and distribution of the prizes occurred after the data collection was completed.

Procedure

Two participants signed up for each session and were randomly assigned to conditions and roles within the dyad. Participants were given subject numbers as they arrived which were put on the consent forms and answer sheets. Worker #1 had a 100 number (i.e. 101) and worker #2 had the corresponding 200 number (i.e. 201). Participants were given the consent forms and the video camera was mentioned. The experimenter collected the completed consent forms, explained the performance reward, and read the Reward Details sheet out loud. The answer sheets were handed out and the following scales were administered: mastery and performance learning orientation, and individualism and collectivism.

The experimenter then handed out the manuals for that condition and read the following: "This is a simulation of a manufacturing company. You will be playing the part of employees working for a company named **'insert name of company for condition'** which builds **'insert name of product for condition'**. You will use the Tinker Toys to build the product. The manual contains several important things. The first thing it contains is information about the organization itself. Second, it contains details about the manufacturing division. This section also explains what your goals are for the production session. The manual also contains an overview of your job and the standard operating procedures that explain how to do your job. The procedures are supplemented by pictures that show how the components and the final product should look. I am now going to read some of the information to you. Please follow along in

your manual." The experimenter then read the company description, the goal sheet and job details page for the condition.

The participants received three minutes to look through the manual and then they began their first 20 minute production session after the experimenter left the room. After 20 minutes, the experimenter stopped the camera and administered the following scales: self-efficacy, goal commitment, task frustration, and HMX. The participants filled out the Progress Report forms concerning their performance. While the participants took a break, the experimenter counted the assemblies completed and recorded the results on the performance sheets and disassembled the parts for next production session.

The experimenter announced that the company's main client had requested some changes to the production schedule, passed out and read the change memo, and asked the participants to complete the self-efficacy scale. The experimenter started the second session, stopped it after 20 minutes, and administered the following scales: goal commitment #2, task satisfaction, HMX #2, and job change. The experimenter handed out debrief forms, answered questions, released the participants and then counted the number of assemblies produced. The experiment took approximately one and a half hours to complete.

Measures

Except for performance, role innovation and role negotiation, the measures were self-report scales. All of the original scales and coding schemes are included in Appendix G.

Individualism/ Collectivism (IC). Individualism and collectivism was preliminary measured by the 20-item IC scale developed by Wagner (1995). The items were rated on a seven-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7). Items were recoded so that higher ratings indicated stronger collectivism. The overall 20-item scale had a coefficient alpha of .8019. However, Wagner (1995) did a factor analysis in which these 20 items fell into five distinct factors. A factor analysis on this data, reported in Table 2 found consistent results. A principle axis factor analysis using Varimax rotation without a set number of factors found five factors with eigenvalues over one. The five factors accounted for 54.8% of the variance. The first factor contained four items and corresponded to the norms scale developed by Wagner and Moch (1986). The second factor contained five items with four of the items from a scale by Erez and Earley (1987) and one item by Triandis, Bontempo, Villareal, Asai and Lucca (1988). The third factor contained three items with two of the items from the values scale by Wagner and Moch (1986) and one item from Erez & Earley (1987). The fourth factor contained five items from Triandis et al. (1988). The fifth factor contained three items that corresponded to the Wagner and Moch (1986) beliefs scale.

Since the 20-item scale consisted of five distinct factors, the decision was made to use only one of the factors. The factor was chosen based on conceptual relevance as well as the robustness of the scale. The five factors were analyzed for content and reliability. The third factor (Wagner and Moch, 1986; Erez & Earley, 1987) was chosen to be used in the analyses. The three item scale asked about the individual's attitude concerning working in groups which seemed appropriate due to the individual versus goal

Table 1: Rotated Factor Matrix for Individualism/ Collectivism Scale

	Factors				
	1	**2**	**3**	**4**	**5**
1[R] Only those who depend on themselves get ahead in life.	.05	.70	.18	.07	.04
2[R] To be superior, a person must stand alone.	.03	.75	.06	.14	.08
3[R] If you want something done right, you've got to do it yourself.	-.04	.71	.16	.14	.14
4[R] What happens to me is my own doing.	-.05	.44	.03	.11	.00
5[R] In the long run, the only person you can count on is yourself.	-.04	.62	.09	.09	.07
6[R] Winning is everything.	.16	.20	.13	.74	.00
7[R] I feel that winning is important in both work and games.	-.04	-.05	-.02	.70	.00
8[R] Success is the most important thing in life.	-.06	.23	-.08	.48	.10
9[R] It annoys me when other people perform better than I do.	-.02	.14	.29	.48	-.03
10[R] Doing your best isn't enough, it is important to win.	.07	.19	.12	.66	.09
11 I prefer to work with others in a group rather than working alone.	.05	.13	.86	.08	.00
12[R] Given the choice, I would rather do a job where I can work alone rather than doing a job where I have to work with others in a group.	-.05	.14	.81	.12	.07
13 Working with a group is better than working alone.	.10	.21	.88	.06	-.01
14 People should be made aware that if they are going to be made part of a group then they are sometimes going to have to do things they don't want to do.	.68	.04	-.05	-.06	.03
15 Only those who depend on themselves get ahead in life.	.82	-.02	-.01	.06	.07
16 People in a group should realize that they sometimes are going to have to make sacrifices for the sake of the group as a whole.	.82	-.08	.09	.10	.17
17 People in a group should be willing to make sacrifices for the sake of the group's well-being.	.74	-.06	.10	-.01	.24
18[R] A group is more productive when it's members do what they want to do rather what the group wants them to do.	.25	.12	-.03	.05	.63
19[R] A group is most efficient when it's members do what they want to do rather what the group wants them to do.	.07	.02	.00	.15	.85
20[R] A group is more productive when it's members follow their own interests and concerns.	.12	.14	.06	-.04	.59

[R] indicates recoded items

manipulation in the context of the interdependent task. The chosen individualism/ collectivism scale consisted of three items (items #11, 12, 13) and had a coefficient alpha of .8994.

Mastery and Performance Learning Orientation. Mastery and performance learning orientation was measured by the 16-item scale developed by Button et al. (1995). The items were rated on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The mastery sub-scale consisted of the first eight items and had a coefficient alpha of .7708. The performance sub-scale consisted of the last eight items and had a coefficient alpha of .8329. The mastery and performance sub-scales were not significantly correlated ($r = .0946$; $p > .05$). A factor analysis was computed on these data (see Table 2) in order to confirm the independence of the mastery and performance sub-scales. A principle axis factor analysis using Varimax rotation with two factors specified found that the items loaded on the predicted factors. The two factors accounted for 44.8% of the variance. The first factor corresponded to the mastery scale, and the second factor corresponded to the performance scale.

Table 2: Rotated Factor Matrix for Mastery & Performance Learning Orientation Scale

	Factors	
	1	**2**
M1. I do my best when I'm working on a fairly difficult task.	.03	.27
M2. When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work.	-.10	.31
M3. I try hard to improve on my past performance.	.14	.58
M4. The opportunity to do challenging work is important to me.	.00	.70
M5. The opportunity to extend the range of my abilities is important to me.	-.03	.74
M6. The opportunity to learn new things is important to me.	.03	.64
M7. I prefer to work on tasks that force me to learn new things.	.04	.67
M8. When I fail to complete a difficult task, I plan to try hard the next time I work on it.	.23	.50
P1. The things I enjoy the most are the things I do the best.	.66	.07
P2. I feel smart when I do something without making any mistakes.	.67	.04
P3. I prefer to do things that I can do well rather than things I do poorly.	.72	-.03
P4. I like to be fairly confident that I can successfully perform a task before I attempt it.	.62	-.02
P5. I am happiest at work when I perform tasks on which I know that I won't make any errors.	.76	-.05
P6. I feel smart when I can do something better than most people.	.59	.00
P7. The opinions others have about how well I do certain things are important to me.	.36	.13
P8. I like to work on tasks that I have done well in the past.	.64	.08

Climate for Innovation. Climate was coded as 1 = traditional organization and 2 = innovative organization. This coding was chosen so that if the hypotheses were supported there would be a positive correlation between the innovative climate and role innovation.

Goal Focus. Goal focus was coded as 1 = individual goal and 2 = group goal. This coding was chosen so that if the hypotheses were supported there would be a positive correlation between the group goal and role innovation.

Horizontal Member Exchange (HMX). Horizontal member exchange was measured using the HMX scale developed by Nason (1995). It measured the quality of the relationship between the partners. It contained statements such as: "My partner and I would probably get along well as teammates." The items were rated on a seven-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7). The 14-item scale had a coefficient alpha of .9610.

Role Innovation. Both of production sessions were videotaped and independent coders watched the tapes and coded instances of role innovation behavior. Development of the role innovation measure involved defining role innovative behaviors, developing a coding scheme and modifying the final measure in order to get a robust scale.

The six role innovation categories identified by West (1987a) were used to develop the expected role innovation behaviors for this task. West (1987a) perceived role innovation essentially as 'making a change to a task' and divided it into six categories of behavior. The six role innovative categories identified were: (1) Setting new work targets/ objectives; (2) Deciding the methods used to achieve work targets/ objectives; (3)

Deciding the order in which different parts of the job are done; (4) Choosing whom you work with in order to carry out your work duties; (5) Initiating new procedures or information systems; (6) Developing innovative ways of accomplishing targets/ objectives (West, 1987a). These categories were used to develop a list of expected role innovations for the task. However, the fourth category, 'Choosing whom you work with in order to carry out your work duties,' was dropped, because it was not applicable to this laboratory study. It was replaced with a general social category called "Redefining relationships with others."

One of the challenges of this study was operationalizing role innovation into concrete behaviors that could be objectively coded. First, the role innovations were separated into the six role innovation categories from West (1987a) with the modified social category. Next, the role innovation categories were broken down into specific task-related behaviors expected in each category. Third, the behaviors were described in action-oriented terms which were the indicators of whether or not the role innovation had occurred. Last, the behaviors were listed on a coding sheet. The coding sheet containing the 15 expected role innovation behaviors is included in Appendix H.

Using the coding sheets, the coders determined whether or not the worker engaged in each of the 15 expected role behaviors. Participants received a mark for each role innovation that they performed in a production session. Since the first production session was a learning and baseline opportunity, the role innovation score used in the analyses was only the score from the second production session.

After the videos were coded, the value of the scale was tested by examining the internal consistency and inter-rater reliability. An initial internal consistency analysis (coefficient alpha = .4681) indicated that the 15 behaviors did not hold together well for measuring role innovation. Some of the 15 behaviors had little or no variance due to low activity/ coding rates. Through a series of internal consistency analyses, the role innovation variable was modified to be a five item measure that consisted of socially oriented behaviors (coefficient alpha = .6682). The five items were behaviors #3, 4, 5, 10 and 14 from the coding sheet (Appendix G).

After identifying a reliable scale, the consistency of the coding for that scale was considered. Most of the sessions were only coded by one rater, however, a select few (n=12) of the sessions were coded by two coders in order to establish inter-rater reliability. Three analyses were done to measure how consistently the videos were coded. First, an intercorrelation of $r = .7542$ ($p<.01$) for the role innovation scores for the two coders showed reasonable similarity. Second, an internal consistency alpha analysis with n=12 and treating the two raters as items found a strong coefficient alpha of .8585. The first two analyses were done on summed scores of the number of the role innovation behaviors done. The third analysis considered the rater agreement for each of the 5 items. Specifically, it measured whether or not the raters marked the same behaviors, not just whether or not the overall sums were similar. The analysis was simply a percentage of the number of items that were rated the same way, and the two raters agreed on 82% of the behaviors. In order to account for within-rater variance, the role innovation scores were standardized within raters.

Some convergent validity was found by comparing the coded role innovation measure with a self-report measure collected in the study. The self-report measure of "Job Change" was developed for this study and gathered at the end. The coded role innovation measure and the self-report job change measure had a moderate and significant correlation ($r = .28$, $p < .05$). In summary, role innovation was a five-item, standardized measure based on the coded behaviors from the second production session.

Role Negotiation. Role negotiation was preliminarily measured through the 15 behavior coding scheme used to measure role innovation. The shared coding scheme led to an artificially inflated relationship between the two variables ($r = .57$; $p < .05$). Role negotiation was defined as occurring when a participant discussed a potential role innovation with the partner. If the two workers discussed a role innovation, then the dyad received one point for role negotiation. The participants in each dyad received the same role negotiation score. This variable was a dyadic-level variable that was disaggregated to the individual level for these analyses. Unlike the role innovation score, the role negotiation score was a sum of the score for the first production session plus that for the second production session. This was done to assure that the complete negotiation pattern was captured. If a negotiation was successful in the first session, then it might not have been repeated in the second session. Even so, all of the negotiations could have impacted behavior in the second session.

An initial internal consistency analysis (coefficient alpha = .4864) indicated that the 15 behaviors did not hold together well for measuring role negotiation. Some of the 15 behaviors had little or no variance due to low activity/ coding rates. Through a series

of internal consistency analyses, the role negotiation variable was modified to be a four item measure that consisted of socially oriented behaviors (coefficient alpha = .6041). These four items are behaviors # 3, 4, 5, and 14 from the coding sheet (Appendix G).

As with role innovation, the same 12 sessions existed for computing inter-rater reliability and similarity. Three analyses were done to measure how consistently the videos were coded. First, an intercorrelation of .7239 ($p < .05$) for the role negotiation scores of the two coders showed reasonable similarity. Second, an internal consistency analysis with $n = 12$ and treating the two raters as items found a strong coefficient alpha of .89. The first two analyses were done on summed scores of the number of the role negotiation behaviors done. The third analysis considered the rater similarity for each item. Specifically, it measured whether or not the raters saw the same behaviors, not just whether or not the overall sums were similar. The analysis was simply a percentage of the number of items that were rated the same way, and the two raters agreed on 96% of the behaviors. In order to account for within-rater variance, the role negotiation scores were standardized within raters. In summary, role negotiation was a 4-item, standardized measure based on the coded behaviors from the first and second production sessions.

Performance. Task performance was measured by the number of final units completed in the second production session. Final units were chosen as the performance measure, because they were the primary concern of the "organizations" in the study. Each participant in the dyad received the same score. Similar to role negotiation, performance is a dyadic-level variable that was disaggregated to the individual level for these analyses. The performance measure was collected by the experimenter at the end of

each production session by counting the number of final units, components and unfinished parts completed before breaking apart the components. The range of the performance score was zero to seven final units.

Task Satisfaction. Task satisfaction was measured by a nine-item scale created for this study. It included items such as "I feel fairly satisfied with the kind of work I did." The items were rated on a seven-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7). The scale had a coefficient alpha of .8601.

Job Change. Job change was a self-report measure of role innovation that was developed for this study. The scale was used as a check for the role innovation coding scheme and the two were significantly correlated ($r = .28$, $p < .05$). The 10 item scale included statements such as "I changed the order of my procedure". The items were rated on a seven-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7). The scale had a coefficient alpha of .8752.

RESULTS

Data Analysis

The psychometric properties of the scales and constructs were assessed before testing the conceptual model. The means, standard deviations, reliabilities and intercorrelations for the scales are presented in Table 1. The hypotheses in this study were primarily tested using hierarchical regression analysis (Cohen & Cohen, 1983). Variables were entered into the analyses according to their order in the model (see Figure 1). The individual difference variables (individualism/ collectivism (IC), mastery and performance learning orientation) were entered into the equation in the first step, since they are believed to be stable characteristics. The manipulations (climate for innovation and goal focus) were entered in the second step, and the other variables were entered in the order of the model. The following analyses show the effects of the different predictors and manipulations on the different dependent variables. An alpha level of .05 was used in the text description for all statistical tests. However, a few marginally significant results are discussed in greater detail with an alpha level of .10. The regression tables reflect three alpha levels (.01***, .05**, .10*) in order to give a more complete picture of the results of this study. The regression results did not support most of the hypotheses, so additional analyses were done in order to examine the relationships from alternative perspectives. Some of the hypotheses were re-examined by considering the change of the variable over time by using repeated measures multivariate analysis of variance with covariates (RM-MANCOVA). Table 10 appears at the end of the Results section and provides a summary of the hypotheses and their outcomes.

Table 3: Means, Standard Deviations, Reliabilities and Intercorrelations for model variables

	1	2	3	4	5	6	7	8	9	10
1. Mastery Orientation	.77									
2. Performance Orientation	.09 (.077)	.83								
3. Individ. - Collectivism	.12* (.032)	.02 (.362)	.90							
4. Climate for Innovation	.03 (.334)	-.01 (.469)	.08 (.126)	na						
5. Goal Focus	.08 (.129)	.07 (.136)	-.02 (.375)	.00 (.50)	na					
6. HMX	.16** (.007)	.09 (.100)	.19** (.002)	.11* (.042)	-.06 (.199)	.96				
7. Role Negotiation	.03 (.310)	.02 (.369)	.14* (.015)	.02 (.368)	-.02 (.368)	.02 (.357)	.60			
8. Role Innovation	.01 (.443)	-.05 (.222)	.09 (.089)	.13* (.022)	-.02 (.424)	-.05 (.216)	.57** (.000)	.67		
9. Performance	.10 (.070)	.01 (.413)	.03 (.314)	-.11 (.05)	.02 (.376)	.11* (.043)	.07 (.139)	-.02 (.402)	na	
10. Task Satisfaction	.25** (.000)	.23** (.000)	.07 (.137)	.05 (.216)	.12* (.032)	.34** (.000)	.03 (.317)	-.07 (.137)	.26** (.000)	.86
Mean	**4.04**	**3.92**	**4.40**	**na**	**na**	**5.56**	**.0189**	**.019**	**3.32**	**5.65**
SD	**.42**	**.57**	**1.31**	**na**	**na**	**.84**	**1.57**	**1.01**	**1.68**	**.69**

* = $p < .05$, ** = $p < .01$; Role innovation and role negotiation are standardized values.
Alpha coefficient reliability in diagonal.

Horizontal Member Exchange (HMX). Hierarchical regression was used to examine how the individual differences, climate for innovation and goal focus influenced the quality of the relationship (HMX) between partners. The first step of the regression entered IC and the two learning orientation variables. The second step entered the climate for innovation condition and the goal focus condition. Table 4 presents the results of the analysis.

Results indicated that the individual differences accounted for a significant amount of the variance in HMX ($R^2 = .06$, $F = 4.82$, $p < .05$). The beta weights show that IC and mastery orientation account for most of the variance and performance orientation is not significant. The beta weight indicated that IC was significantly and positively related to HMX ($\beta = .17$ at step 1, $p < .05$). Since a high IC score indicated a more collectivist outlook, this supported Hypothesis 10 which stated that participants with a collectivist outlook would have higher quality relationships than participants with individualist outlooks. Mastery learning orientation was also positively related to HMX ($\beta = .13$ at step 1, $p < .05$). This provided support for Hypothesis 12 which stated that mastery learning orientation would be positively related to HMX. Performance orientation did not account for any variance in HMX (β at Step 1 = .07, $p > .05$). Though the step was significant, only IC and mastery orientation had significant beta weights. This indicates that performance orientation was not significantly related to HMX.

The second step of the regression entered climate for innovation and goal focus. Hypothesis 4 predicted that participants in organizations with climates for innovation would have higher HMX scores than participants in traditional organizations. Hypothesis

5 stated that participants with group goals would have better HMX scores than participants with individual goals. However, the second step of the regression did not account for any additional variance in HMX ($\Delta R^2 = .01$, $\Delta F = 1.71$, $p > .05$). The climate beta weight (β at Step 2 = .10, $p > .05$) and the goal focus beta weight (β at Step 2 = -.07, $p > .05$) were both non-significant for the step. Thus, neither hypothesis four or five was supported. Overall, the five variables in the regression accounted for seven percent of the variance in HMX ($R^2 = .07$, $F = 3.59$, $p < .05$).

Table 4: Hierarchical Regression Analysis Results for HMX

Step	Predictors	β at Step	Final β	df	R^2 (Adj. R^2)	ΔR^2
1	Individ./Collectivism	.17***	.16***	3	.06***	.06***
	Mastery Orientation	.13**	.14**		(.05***)	
	Performance Orientation	.07	.07			
2	Climate for Innovation	.10	.10	5	.07***	.01
	Goal Focus	-.07	-.07		(.05***)	

*p ≤ .10, ** p ≤ .05; ***p ≤ .01; N = 228

Role Negotiation. Hierarchical regression was used to examine how the individual differences, climate for innovation, goal focus and HMX influenced role negotiation between partners. The first step of the regression entered IC and the two learning orientation variables. The second step entered the climate for innovation condition and the goal focus condition, and the third step entered HMX. Table 5 presents the results of the analysis.

The proposed model did not explain any of the variance in role negotiation. Results indicated that individualism/ collectivism was the only variable that accounted for a significant amount of the variance in role negotiation, and the step was not significant ($R^2 = .02$, $F = 1.63$, $p > .05$). The beta weight indicated that IC was positively related to role negotiation ($\beta = .14$ at step 1, $p < .05$). No specific hypothesis were made concerning this relationship. The other individual differences variables were not significantly related to role negotiation. Neither mastery orientation (β at Step 1 = .01, $p > .05$) nor performance orientation (β at Step 1 = .02, $p > .05$) had significant beta weights for this step. No specific hypotheses were made concerning these relationships. Step two entered the climate and goal manipulations and did not account for any additional variance in role negotiation ($\Delta R^2 = .00$, $\Delta F = .07$, $p > .05$). This indicated that climate for innovation (β at Step 2 = .01, $p > .05$) and goal focus (β at Step 2 = -.02, $p > .05$) did not affect the amount of role negotiation. The third step entered HMX and hypothesis six predicted that there would be a positive relationship between HMX scores and the amount of role negotiation. Step three of the regression showed no support for Hypothesis six ($\Delta R^2 = .00$, $\Delta F = .02$, $p > .05$) and the beta weight for HMX was non-significant (β at Step 3 = -.01, $p > .05$). Overall, the variables in the regression accounted for two percent of the variance in role negotiation ($R^2 = .02$, $F = .83$, $p > .05$).

Table 5: Hierarchical Regression Analysis Results for Role Negotiation

Step	Predictors	β at Step	Final β	df	R^2 (Adj. R^2)	Δ R^2
1	Individ./Collectivism	.14**	.14**	3	.02	.02
	Mastery Orientation	.01	.02		(.01)	
	Performance Orientation	.02	.02			
2	Climate for Innovation	.01	.01	5	.02	.00
	Goal Focus	-.02	-.02		(.00)	
3	HMX	-.01	-.01	6	.02	.00
					(.00)	

*p ≤ .10, ** p ≤ .05; ***p ≤ .01; N = 228

Role Innovation. Hierarchical regression was used to examine how the individual differences, climate for innovation, goal focus, HMX, and role negotiation influenced role innovation. The first step of the regression entered individualism/ collectivism and the two learning orientation variables. The second step entered the climate for innovation condition and the goal focus condition, and the third step entered HMX. The fourth step added role negotiation and the fifth step added the climate by goal interaction variable. Table 6 presents the results of the analysis.

Results indicated that the individual difference variables did not account for much of the variance in role innovation (R^2 = .01, F = .82, p > .05). Individualism/ collectivism (β at Step 1 = .09, p > .05) was not significantly related to role innovation. This provided no support for Hypothesis 11 which predicted a positive relationship between a collectivist outlook and role innovation. Neither mastery orientation (β at Step 1 = .00, p > .05) or performance orientation (β at Step 1 = -.05, p > .05) had significant beta weights for this step. This provided no support for Hypothesis 13 which predicted a positive

relationship between mastery learning orientation and role innovation. However, the null relationship supported the expectation that there would be no significant relationship between performance learning orientation and role innovation.

In the second step, the manipulations did not explain a significant amount of the variance in role innovation ($\Delta R^2 = .02$, $\Delta F = 1.84$, $p > .05$). Hypothesis 1 predicted that participants in a climate for innovation would role innovate more than participants in a traditional climate. The beta weight for climate for innovation provided marginal support ($p < .10$ level) for Hypothesis 1 (β at Step 2 = .13, $p > .05$). The beta for climate in the final step was stronger (β at Step 4 = .13, $p < .05$). In step two, goal focus (β at Step 2 = -.01, $p > .05$) was not significantly related to role innovation. This provided no support for Hypothesis 2 that predicted a positive relationship between group goal focus and role innovation. Step three of the regression showed no relationship between HMX and role innovation ($\Delta R^2 = .01$, $\Delta F = 1.52$, $p > .05$). In the fourth step, role negotiation accounted for significant variance in role innovation ($\Delta R^2 = .32$, $\Delta F = 108.82$, $p < .05$). This significant positive relationship ($\beta = .57$ at step 4, $p < .05$) supported Hypothesis 7 which predicted a positive relationship between role innovation and role negotiation. However, this relationship may be artificially inflated due to measurement bias, since the two variables were collected using the same tape, coders, and a similar coding scheme. The fifth step entered a moderated relationship between climate and goal focus which did not account for any of the variance in role innovation ($\Delta R^2 = .00$, $\Delta F = 1.66$, $p > .05$). This provided no support for Hypothesis 3 which predicted that climate and goal focus would interact. Overall, the variables in the regression accounted for 36% of the variance in role

innovation ($R^2 = .36$, $F = 15.29$, $p < .05$) with most of that variance coming from role negotiation.

Table 6: Hierarchical Regression Analysis Results for Role Innovation

Step	Predictors	β at Step	Final β	df	R^2 (Adj. R^2)	Δ R^2
1	Individ./Collectivism	.09	.02	3	.01	.01
	Mastery Orientation	.00	.01		(.00)	
	Performance Orientation	-.05	-.05			
2	Climate for Innovation	.13*	.34**	5	.03	.02
	Goal Focus	-.01	.22		(.01)	
3	HMX	-.08	-.08	6	.03	.01
					(.01)	
4	Role Negotiation	.57***	.57***	7	.35***	.32***
					(.33***)	
5	Interaction	-.31	-.31	8	.36***	.01
	(Climate x Goal)				(.33***)	

*p ≤ .10, ** p ≤ .05; ***p ≤ .01; N = 228

Performance. Hierarchical regression was used to examine how the individual differences, climate for innovation, goal focus, HMX, role negotiation and role innovation influenced performance. The first step of the regression entered individualism/ collectivism and the two learning orientation variables. The second step entered the climate for innovation condition and the goal focus condition, and the third step entered HMX. The fourth step added role negotiation and the fifth step added role innovation. The climate by goal interaction variable was entered last in step six. Table 7 presents the results of the analysis.

Results indicated that the individual differences in step one did not account for a significant amount of the variance in performance ($R^2 = .01$, $F = .76$, $p > .05$). None of the three variables, individualism/ collectivism (β at Step 1 = .02, $p > .05$), mastery orientation (β at Step 1 = .09, $p > .05$) or performance orientation (β at Step 1 = .01, $p > .05$), had significant beta weights for this step. The second step entered the manipulation variables which, as a whole, did not explain any of the variance in performance ($\Delta R^2 = .01$, $\Delta F = 1.47$, $p > .05$). Although goal focus showed no significant relationship (β at Step 2 = .01, $p > .05$), climate for innovation did have a marginally significant ($p < .10$) relationship with performance (β at Step 2 = -.11, $p > .05$). Step three of the regression showed that HMX accounted for a marginal amount ($p < .10$) of the variance in performance ($\Delta R^2 = .01$, $\Delta F = 1.34$, $p > .05$; β at Step 3 = .11, $p > .05$). In the fourth step, role negotiation did not account for additional variance in performance ($\Delta R^2 = .00$, $\Delta F = 1.11$, $p > .05$). The fifth step showed that role innovation also did not account for any of the variance in performance ($\Delta R^2 = .00$, $\Delta F = .43$, $p > .05$). This provided no support for Hypothesis 8 which predicted a positive relationship between role innovation and performance. The sixth step entered a moderated relationship between climate and goal focus which did not account for any of the variance in performance ($\Delta R^2 = .00$, $\Delta F = .004$, $p > .05$). Overall, the variables in the regression accounted for four percent of the variance in performance ($R^2 = .04$, $F = 1.06$, $p > .05$).

Table 7: Hierarchical Regression Analysis Results for Performance

Step	Predictors	β at Step	Final β	df	R^2 (Adj. R^2)	Δ R^2
1	Individ./Collectivism	.02	.01	3	.01	.01
	Mastery Orientation	.09	.08		(.00)	
	Performance Orientation	.01	-.01			
2	Climate for Innovation	-.11*	-.11	5	.02	.01
	Goal Focus	.01	.04		(.00)	
3	HMX	.11*	.11	6	.04	.01*
					(.01)	
4	Role Negotiation	.07	.10	7	.04	.00
					(.01)	
5	Role Innovation	-.05	-.05	8	.04	.00
					(.01)	
6	Interaction	-.02	-.02	9	.04	.00
	(Climate x Goal)				(.00)	

*p ≤ .10, ** p ≤ .05; ***p ≤ .01; N = 228

Task Satisfaction. Hierarchical regression was used to examine how the individual differences, climate for innovation, goal focus, HMX, role negotiation and role innovation influenced task satisfaction. The first step of the regression entered individualism/ collectivism and the two learning orientation variables. The second step entered the climate for innovation condition and the goal focus condition, and the third step entered HMX. The fourth step added role negotiation and the fifth step added role innovation. The climate by goal interaction variable was entered last in step six. Table 8 presents the results of the analysis.

As a whole, the individual differences accounted for a significant amount of the variance ($R^2 = .11$, $F = 9.20$, $p < .05$) in task satisfaction with most of the variance accounted for by the learning orientations. Results indicated that IC did not have a

significant relationship with task satisfaction (β at Step 1 = .04, $p > .05$). However, both mastery orientation (β at Step 1 = .23, $p < .05$) and performance orientation (β at Step 1 = .21, $p < .05$) had significant, positive relationships with task satisfaction. The manipulation variables entered in step two did not account for any of the variance in task satisfaction ($\Delta R^2 = .01$, $\Delta F = 1.30$, $p > .05$). Neither of the variables, climate (β at Step 2 = .04, $p > .05$) or goal focus (β at Step 2 = .09, $p > .05$), had significant relationships with task satisfaction. Step three of the regression showed that HMX accounted for variance in task satisfaction ($\Delta R^2 = .08$, $\Delta F = 23.13$, $p < .05$) with a positive, significant relationship (β at Step 3 = .30, $p < .05$). In the fourth step, role negotiation did not account for additional variance in task satisfaction ($\Delta R^2 = .00$, $\Delta F = .09$, $p > .05$). The fifth step showed that role innovation also did not account for any of the variance in task satisfaction ($\Delta R^2 = .01$, $\Delta F = 1.50$, $p > .05$). This provided no support for Hypothesis 9 which predicted a positive relationship between role innovation and task satisfaction. The sixth step entered a moderated relationship between climate and goal focus which did not account for any of the variance in task satisfaction ($\Delta R^2 = .00$, $\Delta F = .02$, $p > .05$). Overall, the variables in the regression accounted for 21% of the variance in task satisfaction ($R^2 = .21$, $F = 6.41$, $p < .05$) with most of the variance coming from the learning orientations and HMX.

Table 8: Hierarchical Regression Analysis Results for Task Satisfaction

Step	Predictors	β at Step	Final β	df	R^2 (Adj. R^2)	Δ R^2
1	Individ./Collectivism	.04	-.01	3	.11***	.11***
	Mastery Orientation	.23***	.18***		(.10***)	
	Performance Orientation	.21***	.18***			
2	Climate for Innovation	.04	.00	5	.12***	.01
	Goal Focus	.09	.08		(.10***)	
3	HMX	.30***	.29***	6	.20***	.08***
					(.18***)	
4	Role Negotiation	.02	.07	7	.20***	.00
					(.18***)	
5	Role Innovation	-.09	-.09	8	.21***	.01
					(.18***)	
6	Interaction	.04	.04	9	.21***	.00
	(Climate x Goal)				(.18***)	

*p ≤ .10, ** p ≤ .05; ***p ≤ .01; N = 228

Additional analyses.

The regressions used to test the model hypotheses found few significant results. The data did not support the model, and the variables had zero to minimal relationship with each other. The model and hypothesis testing was based on scores from the second production session. However, this analysis strategy did not offer many useful results, so additional analyses needed to be considered. Due to the unique design of this study, there was an additional opportunity to examine some of the dependent variables over time. It was possible that some relationships between the variables could exist across time or when variables interacted.

In order to consider some of the dependent variables over time, a repeated measures multivariate analysis of covariance (RM-MANCOVA) was computed. This analysis examined the dependent variables as a group effect, over time, with the covariates included. The RM-MANCOVA examined the following four dependent variables that were measured after session one and after session two: performance, role innovation, HMX and role negotiation. Climate for innovation and goal focus were entered as the predictor variables. Mastery and performance learning orientation and individualism/ collectivism were entered as covariates. The results of the RM-MANCOVA are presented in Table 9.

Table 9: RM-MANCOVA Results

Source	df	F
Covariates[a]		
Performance	3, 221	.59
Role Innovation	3, 221	.88
HMX	3, 221	5.34***
Role negotiation	3, 221	1.36
Climate x Goal		
Performance	1, 221	.002
Role Innovation	1, 221	.44
HMX	1, 221	.81
Role negotiation	1, 221	.95
Goal		
Performance	1, 221	1.13
Role Innovation	1, 221	.02
HMX	1, 221	.56
Role negotiation	1, 221	.11
Climate		
Performance	1, 221	3.90**
Role Innovation	1, 221	4.39**
HMX	1, 221	2.76*
Role negotiation	1, 221	.03
Climate x Goal x Time		
Performance	1, 221	.20
Role Innovation	1, 221	.06
HMX	1, 221	1.18
Role negotiation	1, 221	1.59
Goal x Time		
Performance	1, 224	5.87**
Role Innovation	1, 224	.04
HMX	1, 224	1.75
Role negotiation	1, 224	3.12*

Table 9: RM-MANCOVA Results continued...

Source	df	F
Climate x Time		
Performance	1, 224	.93
Role Innovation	1, 224	.20
HMX	1, 224	.002
Role negotiation	1, 224	.001
Time		
Performance	1, 224	737.23***
Role Innovation	1, 224	.41
HMX	1, 224	68.35***
Role negotiation	1, 224	.00

[a]Covariates were mastery and performance learning orientation and individualism/ collectivism.
* $p \leq .10$, ** $p \leq .05$; *** $p \leq .01$

The results of the RM-MANCOVA supported the few results found in the original regression model testing such as the impact of the covariates on HMX ($F = 5.34$, $p < .05$). Climate impacted role innovation ($F = 4.39$, $p < .05$) which confirmed hypothesis one. Participants in the innovative organization role innovated more than participants in the traditional organization (see Figure 4). This analysis provided more complete evidence for the marginal relationship found using the regression analysis.

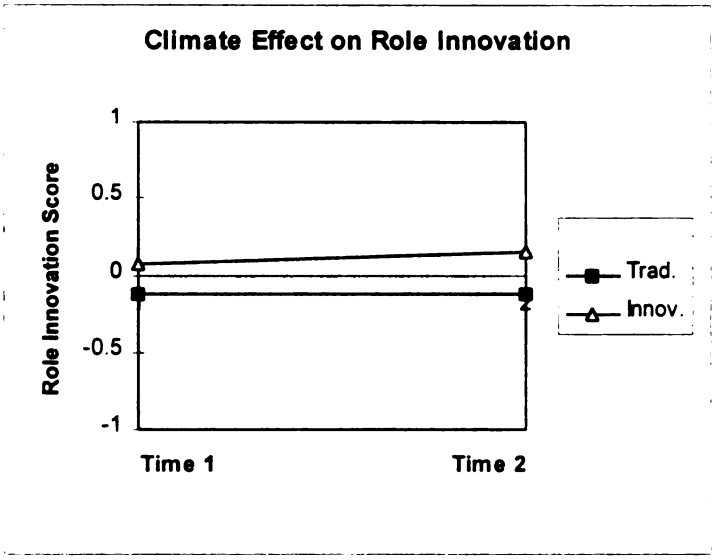


Figure 4: Climate Effect on Role Innovation

Furthermore, the impact of climate on performance ($F = 3.0$, $p < .05$) was shown as seen in Figure 5. Participants in the traditional organization performed better than participants in the innovative organization. Although no direct hypothesis was made concerning climate and performance, it was expected that participants in the innovative organization would perform better after role innovating more. These relationships were not supported. Figure 5 also demonstrated that performance increased over time.

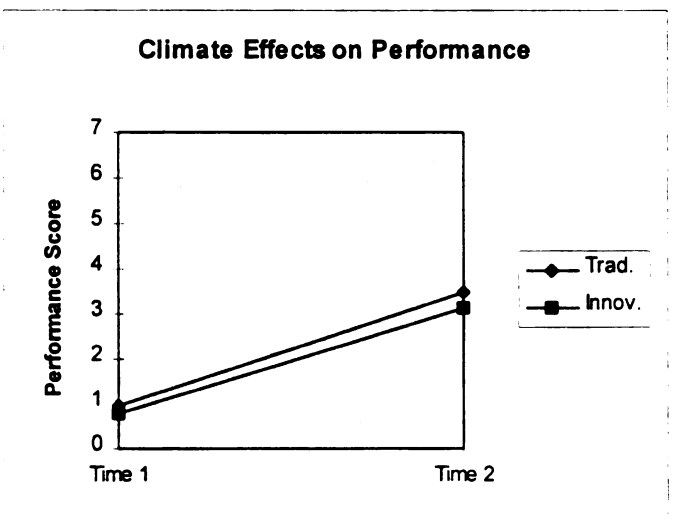


Figure 5: Climate Effect on Performance

The RM-MANCOVA also found a marginal relationship ($p < .10$) between climate and HMX ($F = 2.76$, $p < .10$). Participants in a climate for innovation had higher HMX scores than participants in a traditional climate as seen in Figure 6. This provided marginal support for hypothesis four which was not found with the regression analyses. Figure 6 also demonstrated that HMX increased over time.

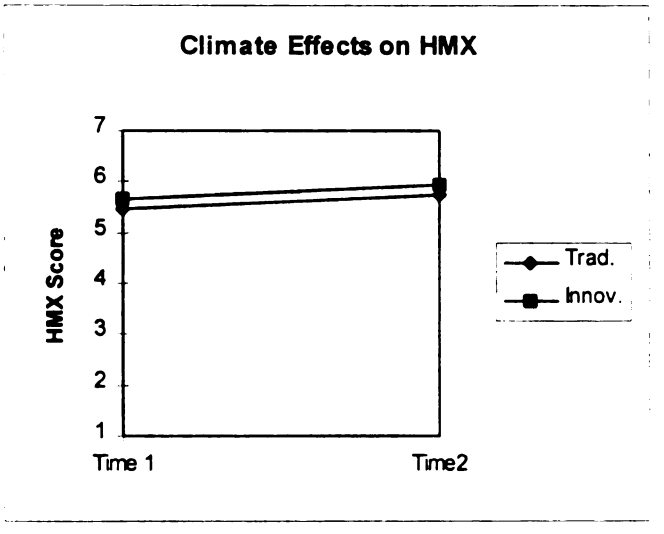


Figure 6: Climate Effect on HMX

There were a few additional time-related relationships, such as performance being affected by a goal by time interaction. As shown in Figure 7, performance differed for the two goal conditions between the two sessions. In the first session, the participants in the individual goal condition performed better than the participants in the group goal condition. However, in the second session, the group goal participants improved. This relationship was not specifically hypothesized in the study, but it provided valuable information by indicating that the goal conditions did have different effects on performance.

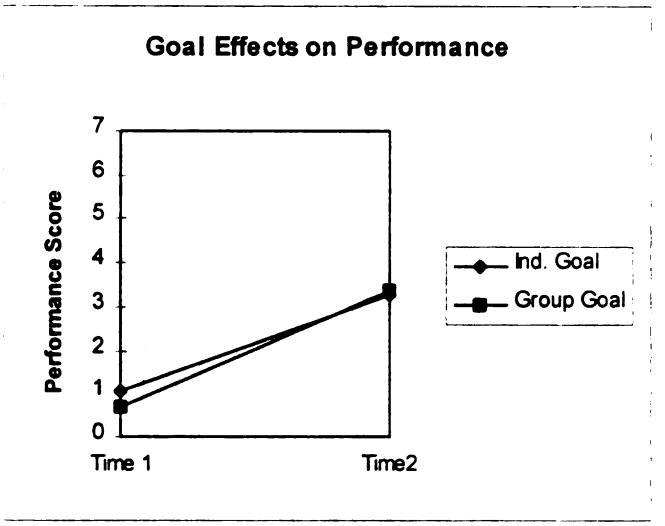


Figure 7: Goal Effect on Performance

Role negotiation also showed a marginal ($p < .10$) effect for the goal by time interaction as seen in Figure 8. Participants in the group goal condition did a smaller amount of role negotiation at time one but a larger amount at time two than the individual goal participants. This indicated that the group goal participants probably learned the value of discussing the task as they worked together. This relationship was also not specifically hypothesized, but it also shows that the goal condition exerts subtle effects on some variables over time.

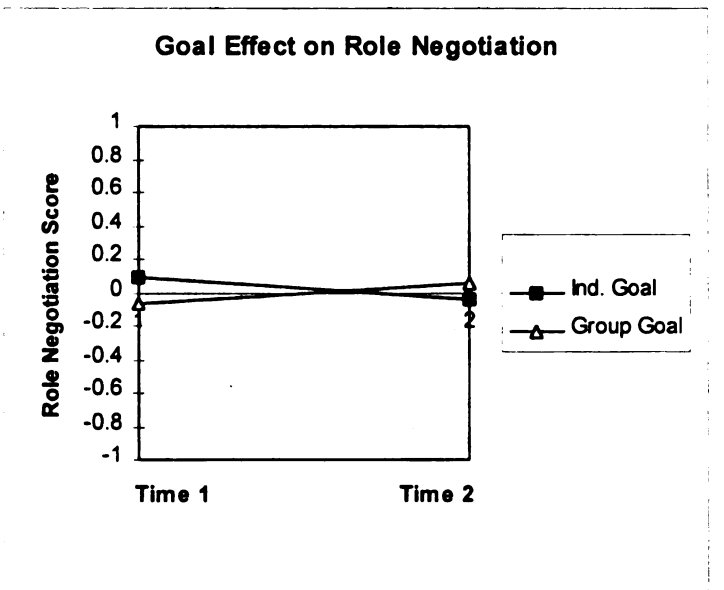


Figure 8: Goal Effect on Role Negotiation

The strongest results came from the time effect itself. Performance showed a dramatic time effect ($F = 737.23$, $p < .05$) as it increased from time one to time two. However, this is a predictable result. The first session was essentially a learning trial and performance was expected to be low. By the second session, participants were expected

to have learned the task and be able to perform better. Another result is that HMX changed over time ($F = 68.35$, $p < .05$). This result probably stems from the fact that people rated each other higher as they got to know one another during the sessions.

The RM-MANCOVA supported the original findings of the model testing, pulled out some more subtle relationships and demonstrated some predictable but unhypothesized findings (i.e. performance improved over time).

Table 10 Summary of Hypothesis Support

Hyp	Variables in Analysis	Expected Direction of Results	Supported?
1	IV: Climate (innov./ trad.) DV: Role Innovation (RI)	More RI in innovative org	Yes
2	IV: Goal (group vs. ind) DV: Role Innovation (RI)	More RI in group goal condition	NO
3	IV: Climate x Goal Interaction DV: Role Innovation (RI)	(Goal x Org) variable will be sig.: Innov org = more RI with group goal. Trad. org = more RI with Ind. goal.	NO
4	IV: Climate DV: HMX Score	Higher HMX in innovative org. condition	NO
5	IV: Goal (group v. ind.) DV: HMX Score	Higher HMX in group goal condition	NO
6	IV: HMX DV: Role Negotiation (RN)	Positive rel. between HMX and RN	NO
7	IV: Role Negotiation (RN) DV: Role Innovation (RI)	More RI for participants who do more role negotiation	YES
8	IV: Role Innovation (RI) DV: Performance (PF)	Performance is better for participants who RI	NO
9	IV: Role Innovation (RI) DV: Task Satisfaction	Task satisfaction is higher for participants who RI	NO
10	IV: Collectivism DV: HMX	Participants high in collectivism will have higher HMX scores	YES
11	IV: Collectivism DV: Role Innovation (RI)	Participants high in collectivism will do more RI	NO
12	IV: Mastery orientation DV: HMX	Participants with high mastery orient. will have higher HMX	YES
13	IV: Mastery Orientation DV: Role Innovation	Participants with high mastery orient. will have higher HMX	NO

DISCUSSION

This study was designed to investigate the predictors and outcomes of role innovation. The model presented two organizational variables, climate for innovation and goal focus, that were expected to directly and indirectly affect role innovation. In order to better understand the construct of role innovation, the process leading to it was also investigated. This process included horizontal member exchange (HMX) relationships which were expected to affect role negotiation which would then affect role innovation. The model concluded by considering performance and task satisfaction as two possible outcomes of role innovation. The model also included three individual difference variables, mastery and performance learning orientation and individualism/ collectivism (IC). This discussion section will first consider the two primary research questions that were centered around role innovation. Next, the relationships with final outcomes and individual differences will be considered. Finally, the discussion section will conclude with the limitations, contributions and future directions for research.

Primary Research Questions

The model was designed to answer two primary research questions. The first question was: Will the organizational factors of climate for innovation and goal focus affect role innovation? It was expected that factors in the organizational environment would encourage or constrain an individual's tendency to role innovate. Primary and secondary messages sent by organizational policies, procedures and the working environment should cue people as to how role innovations would be received. Participants were expected to use this information when deciding whether or not to role innovate.

Climate for innovation was one organizational factor that was expected to impact role innovation, since people get messages about acceptable behavior from the climate. In the initial regression analysis, only a marginal relationship was found between climate for innovation and role innovation. Specifically, hypothesis one which predicted a positive relationship between climate for innovation and the amount of role innovation was only marginally supported at the $p < .10$ level. This suggested that climate for innovation may be related to role innovation, but the regression analysis could not confirm the relationship. However, the RM-MANCOVA analysis did find that climate for innovation was related to role innovation as predicted in hypothesis one ($F(1, 221) = 4.39$, $p < .05$). Participants in the innovative organization did role innovate more than participants in the traditional organization. In the innovative organization, participants heard stories about a successful employee who innovated and an organizational description that promoted innovation. As intended, these messages must have indicated to the participants that innovation was encouraged which allowed the behavior to occur. The relationship between climate and role innovation was hard to detect, since the RM-MANCOVA found it but the regression was marginal. This discrepancy probably occurred because the RM-MANCOVA had more power and data than the regression analysis.

In addition to climate, goal focus was an organizational factor that was expected to influence role innovation. Goal focus distinguished between giving individual or group goals for the interdependent task. It was predicted that participants with group goals would role innovate more. They had to focus on the group task as well as the

individual task which gave them opportunities to role innovate with their own work, the group work or the interactive roles. It was expected that people with individual goals would focus more on their own work and not do as many of the group-related role innovations. None of the analysis results supported these predictions, so no support was found for hypothesis two that predicted a positive relationship between group goal focus and role innovation. It is possible that participants concentrated on the obviously interdependent nature of the task and did not give any more thought to the goal manipulation. The simplicity of the task may have made all possible role innovations apparent to both conditions, not just the group goal condition. Since this study was concerned about goal focus, "do your best" goals were used instead of challenging, specific goals as recommended by many researchers (Latham & Locke, 1991). This may also partially explain why no effect was found for the goal manipulation - the manipulation itself might not have been effective. A better strategy may have been to use specific and difficult goals with an individual or group focus, because they may have provided more incentive to pay attention to the goal manipulation. Hypothesis three predicted an interaction effect of climate and goal focus based on the expectation that group goals would cause people to conform to the norms established by the climate. Therefore, participants with group goals in innovative climates were expected to role innovate more than participants with individual goals. Participants with group goals in traditional climates were expected to role innovate less than participants with individual goals. However, the weak effect of the climate and goal manipulations meant that no interaction was possible and no support was found for hypothesis three.

The climate and goal manipulations were also hypothesized to relate to HMX. Hypothesis four predicted a positive relationship for climate for innovation and HMX which was marginally supported by the RM-MANCOVA analysis. Although marginal, the relationship went the expected direction, since participants in the innovative climate had higher HMX scores. Past research indicated that climate provides workers with clues concerning appropriate interpersonal and task related behavior (Scott & Bruce, 1994; Farr & Ford, 1990). The marginal results (and the hard to detect relationship between climate and role innovation) may be due to the difficulty of manipulating an organizational climate variable in a lab setting. The participants might not have been completely tuned in to the organizational climate presented in the manipulation. Instead they might have been attuned to the climate created by being in an experiment. This experiment climate might have induced them to strictly follow the directions instead of innovating on the task. The climate in real organizations is likely to have a bigger impact on HMX relationships and role innovation than found in this lab study. In real organizations, climate has been shown to influence intentions and behavior (Schneider & Bowen, 1985).

Hypothesis five which predicted a positive relationship between group goal focus and HMX was not supported. There was no difference in relationship quality for participants in the individual goal condition as compared to those in the group goal condition. It is possible that the goal manipulation was not salient enough due to the constraints of the "do your best goals." Furthermore, HMX tended to have a ceiling effect, because participants were hesitant to give their partners a low score. Participants may have based the HMX score on non-task related issues such as how much they liked

the partner. The experimental setting and nature of the participants may have negatively affected the HMX and related analyses. This study did contribute to the understanding of organizational influences on role innovation by showing that climate for innovation did have an impact, even if no evidence was found concerning the effect of goal focus on role innovation. The lack of results for the goal manipulation may have been due to weaknesses in the study design (see Limitations), and goal focus should not be quickly dismissed as a potential influence.

The second research question considered in this study was: How do HMX and role negotiation contribute to the role innovation process in interdependent workgroups? By considering the process, it was hoped that the negotiation patterns and interaction of the dyad could explain why some participants role innovated more than others. It seemed reasonable that certain types of interaction patterns would lead to more or less role innovation, since the task was interdependent. The model predicted that horizontal member exchange (HMX) and role negotiation would precede role innovation and help to predict it. However, this model as a whole was not supported and the main significant relationship found was confounded by measurement problems.

HMX reflected the quality of the relationship within the dyad and was expected to establish the interaction pattern between the partners. If the partners liked working together, they were expected to negotiate more and eventually feel less constrained to role innovate. In this study, HMX measured the quality of the relationship between the partners, and role negotiation was supposed to provide a behavioral measure of the outcome of that quality. Hypothesis six predicted a positive relationship between HMX

and the amount of role negotiation, however this was not supported. None of the variance in role negotiation was explained by this model. The simplicity of this task might have negated the need for role negotiation. Many times the role innovations were done without discussing them first. If the partner had to change to accommodate the role innovation, the change was often made quickly and without discussion. Most of the conversation between partners centered around classes and tests and was completely unrelated to the task. HMX was based on non-task interaction, so it is not surprising that it did not relate to the task-oriented role negotiation.

Role negotiation was not related to HMX, however, a strong positive relationship was found between role negotiation and role innovation which supported hypothesis seven. This was expected since people who role negotiate with their partner are more likely to feel comfortable about proceeding with a role innovation. Although this hypothesis was supported, the relationship was probably artificially inflated by the similar measurement of the two variables. This potential confound was discussed in more detail in the limitations section.

Through the RM-MANCOVA, another un-hypothesized relationship was found for role negotiation. A marginal effect ($p > .10$) was found for the goal by time interaction on role negotiation. Participants in the group goal condition did a smaller amount of role negotiation at time one but a larger amount at time two than the individual goal participants. The group goal participants probably learned the value of discussing the task as they worked together. This finding does indicate that there were some subtle relationships concerning the goal focus manipulation. The results of the study provided

limited support for the two primary research questions. For question one, climate for innovation was shown to be an organizational factor that affected role innovation. However, no relationship was found between goal focus and role innovation. For question two, the model did not contribute much to the understanding of role innovation.

Final Outcomes

In addition to manipulations, the model of role innovation included two final outcome variables - performance and task satisfaction. Hypothesis 8 predicted that performance would improve as more role innovation occurred. The task was designed awkwardly in order to initiate corrective role innovations, therefore role innovation should have allowed better performance. However, this hypothesis was not supported. According to the regression analyses, none of the variables predicted performance (except for marginal effects of climate and HMX). As a whole, the six variables predicted zero percent of the variance in performance.

However, the RM-MANCOVA analysis showed an un-hypothesized relationship between climate for innovation and performance. The results indicated that participants in the traditional organization performed better than participants in the innovative organization. Although this relationship was not explicitly hypothesized, the found relationship was contrary to expectations. It was expected that participants in the innovative climates would role innovate more, develop better procedures, build more products and therefore perform better. However, the results indicated the opposite, and the traditional climate eventually lead to better performance. Since climate was shown to impact role innovation, participants in the innovative climates might have spent time role

innovating at the cost of immediate production time. The effect of the climate manipulation and advantage of the role innovation might have been seen in later production sessions after the role innovations were implemented and made routine.

Goal focus also had an un-hypothesized goal by time relationship with performance that was found by the RM-MANCOVA. In the first session, the participants in the individual goal condition performed better than the participants in the group goal condition. However, in the second session, the group goal participants performed better. This performance relationship more closely followed the expectations of the study. At time one the individual goal participants performed better which may be due to higher levels of personal responsibility and less social loafing. At time two, some of the individual goal participants had figured out that they were being rewarded only for their individual components and started focusing on the individual tasks. Since the performance measure was based on the number of completed final units, participants in the individual condition ultimately did worse on performance.

This study found some interesting relationships, but not the primary relationship in the model between role innovation and performance. The simplicity of the task may have allowed adequate performance regardless of role innovation. The session tapes seemed to indicate that motivation predicted performance better than role innovation. Participants who discussed the performance reward and agreed to try for it performed very well regardless of innovative behavior. Role innovation might need to be studied using a more complex task or re-conceptualized to include a motivational aspect.

Since the problem is usually easy to solve, role innovation might actually rely more on motivation than on innovation. Some researchers (Staw & Boettger, 1990) even believe that role "innovation" is somewhat of a misnomer, since the appropriate behavior is rather obvious and does not always require much creativity. Farr & Ford (1990) recognized that the innovative aspect of role innovation must be considered on a continuous scale. Since role innovation solutions are often obvious, most individuals should be capable of initiating them (Farr & Ford, 1990). Other researchers would add that all creativity and innovation result more from hard work than from creative genius (Staw, 1990). These researchers indicate that role innovation could be considered from a motivational perspective instead of an innovation perspective. From a motivational perspectives, variables such as job commitment, job involvement, ambition and proactiveness may have an impact on role innovation. If a worker is committed to his or her job, wants the job to improve and wants to make a good impression, he or she should be more likely to invest the time and energy to role innovate when necessary. Less motivated people should be content with the status quo and not seek change.

In addition to performance, hypothesis nine predicted a positive relationship between role innovation and task satisfaction. Since the task was designed to be awkward, it was expected that participants would be more satisfied after making some changes. However, role innovation did not predict task satisfaction and the hypothesis was not supported. Motivation and interest appeared to affect task satisfaction as well as performance. Some of the participants considered working with Tinker Toys to be a treat, while others considered the whole experiment as a chore. Compared to

performance, the model as a whole did a better job of predicting task satisfaction. The six variables accounted for 18% of the variance in task satisfaction. This variance is primarily accounted for by mastery orientation, performance orientation and HMX. None of these relationships were hypothesized in the study.

Individual differences

Further analysis considered individual difference variables related to role innovation. Both collectivism and mastery orientation were expected to predict role innovation. Hypothesis 11 predicted that participants high on collectivism would role innovate more, since the task was interdependent. They were expected to relate better to their partner, negotiate more and feel more comfortable role innovating. However, no support was found for hypothesis 11. This lack of results may have been due to experimental constraints. It is possible that the behavior of the participants was constrained by being in an experiment and not affected by general tendencies such as collectivism. Furthermore, collectivism was measured by the participant's preference for working in groups which may have been negated by the forced group situation of the experiment. Furthermore, hypothesis 13 predicted a positive relationship between mastery orientation and role innovation, but this relationship was also not supported. It is possible that the task did not offer enough challenge and interest to engage different responses between participants who were high and low on mastery.

Some predictions were also made about other variables in the model such as relationships with HMX which had several positive relationships with the individual difference variables. Hypothesis 12 predicted a positive relationship between mastery

learning orientation and HMX which was supported. Participants with higher mastery learning orientation were more likely to report higher quality relationships with their partners. The higher mastery orientation probably led the participants to enjoy the challenge of the new task and cooperate with the partner on the interdependent aspects of the task. As expected, performance orientation was not related to HMX. Performance oriented people probably sought to do well on the task, but doing well on an interdependent task may or may not have required establishing a good relationship. If the participant saw the relationship as an important part of performing well, then HMX should have increased. However, people with high performance orientations might also have seen the relationship as tangential to performance and not worried about it. This dichotomy of approaches for performance oriented people probably canceled out any significant relationship.

IC also related to HMX as predicted in hypothesis 10, since collectivism was positively and significantly related to HMX. Participants who were high in collectivism reported higher quality relationships with their partner. The collectivism measure asked about the individual's satisfaction with working in groups. It followed logically that participants who enjoyed working in groups would develop better relationships with their partner. The three individual difference variables explained five percent of the variance in HMX.

The results of this study were disappointing. Few of the hypotheses were supported and the primary research questions were not adequately answered. The poor results may be due to the limitations of the study as discussed in the next section, or they

may reflect a conceptual or operational problem. Role innovation has always been a challenging concept to study. By its very nature, innovative behavior is a hard concept to predict or place boundaries around. Staw & Boettger (1990) found a surprisingly low base rate of task revision in their research. They also found that conformity to control mechanisms such as goal setting and norms restricted role innovation even more. The manipulations in the study may unwittingly have decreased the already hard to detect behavior. Future research will have to try to distinguish between study effects and actual role innovation.

Limitations

The lack of results may have been due to some basic limitations of the research that included the measures, coding, manipulations, participants and aggregation of the variables. The most obvious problem centered on the measures used in the study. Role innovation was the primary variable in the study and it was hard to operationalize, code and transform into a robust scale. The role innovation measure was based on the task design and refined after the pilot study, and it consisted of 15 behaviors that were potential role innovations for the given task. Operationally, these behaviors placed limitations on what could be considered as role innovation. This did not allow for role innovations that were outside of the expectations of the experimenter. For instance, one possible role innovation occurred if the participant chose not to fill out the required work orders, since the work orders slowed down production time. However, several dyads did not fill out the work orders during the production, but one partner would do all of the paperwork when he or she had a lull. This was an innovative split of the workshare,

however, it did not count as a role innovation according to the original coding scheme. Coding was also a difficult aspect of the role innovation variable. Although the behaviors on the coding sheet were very specific, it was still sometimes questionable as to whether the behavior had occurred or not. Furthermore, the participants were often inconsistent in their behavior which opened questions concerning how a behavior should be marked. Participants might do a role innovation once and then revert back to the original behavior, and sometimes the role innovation appeared to be an accident.

It was also difficult to turn the coding scheme into a scale with strong psychometric properties. The original conceptualization gave each participant a point for every one of the fifteen role innovations that was performed, and role innovation was planned be a count of the total number of behaviors. Treating role innovation as a count did not allow for any psychometric tests to determine whether or not the measure was robust. The measure was then re-conceptualized as a scale, and tests were conducted to check for internal consistency. These tests indicated that only five of the behaviors hung together as a coherent scale, so these five behaviors became the final scale. This switch from a count to a reduced scale indicated that the variable was not well-constructed at the start. The extraneous ten behaviors just complicated the coding. The role negotiation variable was developed and coded in a similar fashion as the role innovation variable, which created an artificially high relationship between the two variables.

The best solution for the coding issues might be to use a more global coding scheme. The identified behaviors could be used to guide a more general rating of a question such as, "Worker #1 role innovated a lot, a little or none at all". An appropriate

global measure could be developed that was less behaviorally oriented. In a global measure, the participants would get more credit for intentional and repeated role innovations. A behaviorally anchored rating scale (BARS) could be used to guide the global ratings. Studies have shown that BARS can improve reliability (Maas, 1965) and accuracy (Vance, Kuhnert, & Farr, 1978) over other types of ratings. A new rating approach might help future research.

Along with the coding scheme, the coders had some problems in this study. They did not receive enough training which created some uncertainty concerning the consistency of the coding. One coder in particular had a complete misunderstanding about the coding which was not discovered until most of the coding was completed, therefore most of her coding was rejected. This event and a basic time constraint resulted in very few tapes being double coded which made it difficult to assess inter-rater reliability. Some of the differences between coders were minimized by standardizing the scores within raters before combining them for the final analyses.

The climate and goal manipulations also had some problems. Climate is always hard to manipulate in a laboratory session, but the pilot study did indicate that participants in the two conditions perceived the organizations as being significantly different. One analysis found a significant relationship for climate and role innovation whereas the other analysis found a marginal relationship. Based on these findings, it should be reasonable to assume that the relationship exists but is weakened by the difficulty in studying climate in the laboratory. As mentioned earlier, participants might

have been responding to the climate of being in an experiment as well as the climate presented in the study.

In the pilot study, the goal focus manipulation provided participants with difficult, specific goals, but this had the side effect of stopping production if the participants reached the goal before the session was over. In order to keep production going for the whole session, the goal manipulation in the actual study was made generic ("do your best'), which seemed to be adequate since the primary purpose was to make an individual or group focus. However, the study found no results for the goal manipulation. The goal manipulation might not have been salient enough and might not have created the pressure created by trying to reach a specific, difficult goal. It is possible that this manipulation would have worked better if the goals had been specific and difficult (Latham & Locke, 1992) as well as individual or group focused.

The participants used in the study might also have affected the results. They were mostly first year student in their first semester of college and showed far more reluctance about "breaking the rules" than the more advanced pilot study participants did. The participants frequently talked about how they should follow all of the rules, since they were in an experiment. In a real-world situation, workers would be comfortable in their work environment and be better able to gauge what role innovations might be appropriate.

Another problem was that several of the variables (performance and role negotiation) were disaggregated from the dyad level to the individual level. In essence, this created a multi-level model that consisted of individual and dyadic level variables.

The fact that these two variables were constrained by the dyad was not accounted for in the study.

Contributions

Although many of the hypotheses were not supported, this study did make several important contributions. The first contribution was that it did find a relationship between climate for innovation and role innovation even with the manipulation difficulties. This provides a basis for considering other issues such as how to foster role innovation in employees if desired. Furthermore, the study helped develop the HMX construct and demonstrated the relationship between HMX and other variables such as mastery orientation and task satisfaction. Second, the study provided a strong, well-bounded definition of role innovation. Past researchers had relied on poorly specified definitions that often did not capture the multi-dimensional aspects of role innovation. The study definition highlighted the task-focus and social elements of role innovation, was based on the role, job and innovation literature, and provided the boundaries for the concept.

A third contribution was the attempt to study role innovation in a laboratory setting, since most earlier research was either conceptual or survey-based. The laboratory provided greater control over the manipulations. However, the disappointing results of this study may indicate that it is not appropriate to study role innovation in a contrived setting. Fourth, this study tried to predict and identify role innovative behaviors within a specific context by developing an appropriate coding scheme. This involved identifying the specific behaviors that were role innovations. This was one of the first attempts to break the behavior down into observable segments which could be quantified. This

coding scheme was necessary for the study, but might also have prohibited the notice of other role innovations. A fifth contribution was that this study considered the process involved in role innovation instead of simply defining it as an outcome. An attempt was made to link role innovation to HMX and role negotiation as well as final outcomes. This placed role innovation into a complete context and exposed some of the complexities of looking at the whole process.

Perhaps the most important contribution of this study is that it suggested some conceptual changes to the variables and their definitions. Although the role innovation definition provided good structure for the concept, the poor results and subjective analysis of the session tapes indicate that it may be lacking a motivational element. As discussed earlier, role innovation may rely partially on the worker's motivation to change and improve the job. The definition of role innovation could be reconceptualized as a multi-faceted construct that includes task-focus, a social element and a motivational element. The motivational elements might be captured through measures of job commitment, job involvement, proactiveness and more.

However, an alternative approach would be to accept the current definition of role innovation and investigate motivation as a predictor or instigator of it. The definition currently presents role innovation as the behavior of the worker when changing a task. The behavioral definition could remain as is, and motivation could act as a predictor. Motivation is hinted at in the current definition since it is a "proactive process", but it might have a stronger impact as a predictor. By considering motivation as a predictor and

not a basic part of the definition, it would allow future researchers to investigate many different motivational predictors that might affect role innovation.

The study also suggested a conceptual change to the performance variable. In this study, the definition of performance was constrained by the task design. The simulation involved companies that were trying to produce and ship final products, therefore performance was measured by the number of final products produced. This definition was based on the mission statements of the simulation organizations. However, performance can be a complicated, multi-dimensional construct. One issue concerned what the performance variable was actually measuring. In this study, performance might simply have been measuring working speed, speed of information acquisition (i.e. reading speed for the manual), or manual dexterity. It is important to determine whether the performance variable is measuring the intended skill, trait or behavior. The multi-dimensional nature of performance also indicated that it could include other dimensions such as a measure of quality. Due to the age and poor condition of the Tinker Toys, this study was unable to measure quality of the product. Future research could consider more complete measures of performance. This study presented a definition of role innovation and stimulated some important conceptual ideas and directions for future research.

Future Research Directions

In future studies, researchers should try to improve on the limitations of this study. For instance, new ways to operationalize role innovation must be developed. Researchers must find an objective means for determining when a role innovation has occurred by answering questions such as: Does role innovation occur when behavior

deviates from a standard, when an individual perceives that he or she has done something new, or when co-workers perceive a behavior as different? Research on role innovation will not proceed until questions such as this can be satisfactorily answered and built into a research plan. As role innovation is being defined, researchers should consider the motivational aspects of it that were discussed earlier. It may be useful in the future to take a motivational perspective to role innovation instead of trying to fit it within the innovation research framework.

The limitations of this laboratory study indicate that role innovation should probably be studied in natural field settings. Variables such as climate that are likely to influence role innovation do not work well in a lab setting. Furthermore, when considering the role innovation process, it might be more appropriate to consider it from a motivational perspective. Since role innovations are usually small-scale changes, they are often apparent to many people. Motivation may be the reason why some people choose to make changes and others do not. Finally, if role innovation is studied between dyads or teams, then the level of analysis should reflect that. The interdependent nature of most tasks makes it difficult to identify individual contributions and initiative.

In conclusion, this study demonstrated a relationship between climate and role innovation, but failed to support many of the other central hypotheses. It indicated that the approach to studying role innovation needs to be re-conceptualized. The difficulties in the study highlight the problems inherent in studying novel response behaviors such as role innovation. Many of the non-significant relationships in this study can be attributed to operational and design problems and should not automatically be used to claim that role innovation is not affected by the variables in the model. Large amounts of anecdotal

evidence exists in support of role innovation. Most people who have worked in a factory can cite examples of workers who have redesigned their processes or bypassed safety measures (not recommended) in order to work faster or better. Early researchers have related stories about places like Hawthorne where all sorts of unofficial, time-saving devices and tools were found in the workbenches after the plant closed. These provide anecdotal evidence that role innovation occurs in organizations. Employee-initiated change may become critical in today's quickly changing work environment, and role innovation is the most basic type of change. It falls to the organizational researchers to find a way to study and eventually encourage this behavior.

APPENDICES

APPENDIX A:
ORGANIZATION DESCRIPTIONS

New Directions, Inc.

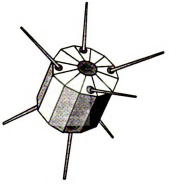
Welcome to New Directions, Inc. We are proud to have you as part of the New Directions team. We have prepared the following orientation materials in order to introduce you to the company.

What products does New Directions, Inc. produce?

New Directions, Inc. is a middle-sized company that makes communication satellites. Our satellites are helping to change the world. They allow people on opposite parts of the globe to have instantaneous communication with phones and with new video-conferencing. Other features include:

- 24-hour remote modem hook-ups regardless of location
- Location positioning for ships on any ocean
- Real-time heat sensor feedback analysis of military targets
- High-tech weather watch forecasting.

At New Directions, Inc., we connect the world with the future.



How are these products produced?

As part of a fast-paced, competitive industry, we focus on creating newer and better products, services and techniques for our business. We are a high-tech company that puts as much attention into assembling a superior part as we do into designing it. We strive every day to improve our product and our company. In order to beat our competition, we are always striving to find new and better ways to do things.

Everyone in the organization shares this competitive spirit. Our employees want to make New Directions the best in its field. Since our product is so important, we work very hard to assure high quality. Quality of the product is everyone's responsibility, from the workers who assemble the satellites to the company President.

What type of employees do well at New Directions, Inc.?

New Directions, Inc. recognizes the importance of having good employees in order to achieve high quality. We only hire employees who are bright, creative and motivated. Everyone has a contribution to make to their job and to the organization. At New Directions, we expect our employees to make a contribution to the organization, not just to show up and punch the clock. We hire employees who are willing to work in the New Directions spirit.

New Directions, Inc. Employee of the Month

New Directions, Inc. is proud to announce the employee of the month - Lee Peterson. Lee was selected as employee of the month due to contributions made in the Inventory department. Lee was trained to use the original inventory tracking system. The old system used paper-based tracking forms and handwritten log sheets to determine where to send products. Lee began to realize that the inventory tracking could be done in a better way, and developed a computerized tracking system for inventory. This system uses electronic tags and the system can immediately find any product and tell the status of that product. This new system has improved delivery time and accuracy by almost 55% over the old system. Lee saw a need at New Directions and stepped forward to offer a solution. Lee Peterson represents the spirit of New Directions, Inc.

Company Vision

We will strive to develop and produce superior, high-quality satellites that always exceed the expectations of our customers. We will work to become the leader in our industry by developing new products and envisioning new ways to use them. By hiring ambitious and creative employees, we will ensure that workers in all divisions will strive to find new and better ways to design, build and market our product. We strive to take our company, our employees and our customers in new directions.

Johnson & Sons, Inc.

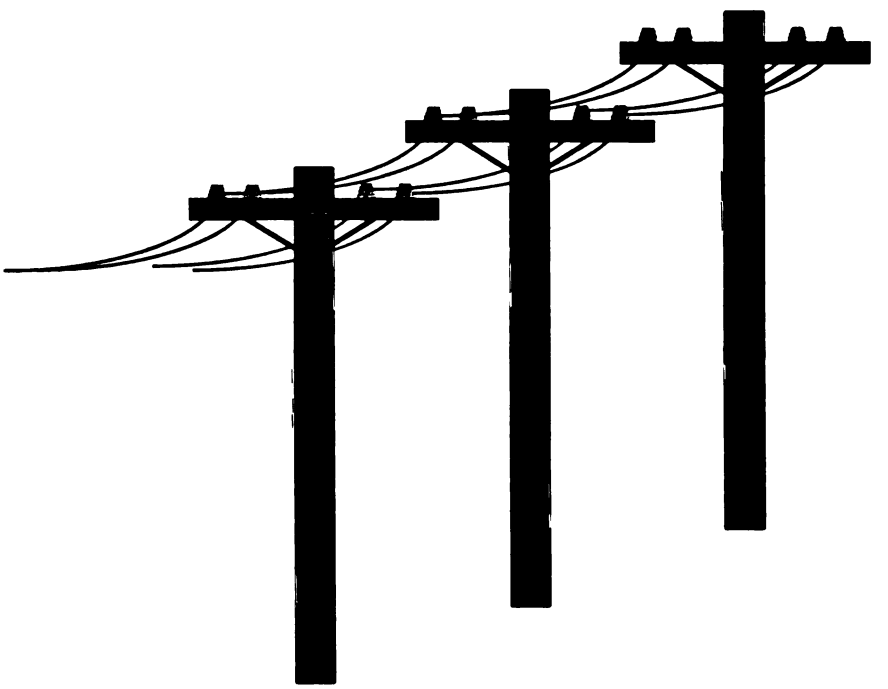
Welcome to Johnson & Sons, Inc. We are proud to have you as part of the Johnson & Sons team. We have prepared the following orientation materials in order to introduce you to the company.

What products does Johnson & Sons, Inc. produce?

Johnson & Sons, Inc. is a middle-sized company that makes telegraph machines. Our telegraph machines are helping to preserve a traditional form of communication. They allow people to communicate through Morse Code. Our telegraph machines allow people in remote areas to communicate. Other uses for the telegraph machines include:

- Military communication
- Badge training for Boy Scouts.

At Johnson & Sons, Inc., we help to preserve the past.

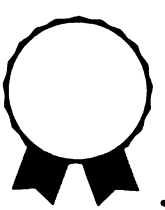


How are these products produced?

As part of an established industry, we focus on producing our products the same way that we always have. We are a traditional company that is devoted to assembling a product that meets all of our standards and requirements. Since our product is so important, we work very hard to maintain our traditional high quality. Quality of the product is everyone's responsibility, from the workers who assemble the telegraph parts to the company president. We strive every day for consistency and reliability. Everyone at Johnson and Sons shares this respect for tradition and helps maintain our ways of doing business.

What type of employees do well at Johnson & Sons, Inc.?

Johnson & Sons, Inc. recognizes the importance of having good employees in order to achieve high quality. We only hire employees who are prompt, dependable and honest. At Johnson and Sons, we expect our employees to do things the Johnson & Sons way. We have employees who understand and appreciate our traditions.



Johnson & Sons, Inc. Employee of the Month

Johnson and Sons, Inc. is proud to announce the employee of the month - Lee Peterson. Lee was selected as employee of the month due to contributions made in the Inventory department. Lee was trained to use the inventory tracking system. The system uses paper-based tracking forms and handwritten log sheets to determine where to send products. Lee contributes to the department by typing up the log sheets so that they are more readable. Lee has been a faithful employee at Johnson and Sons for 10 years. Lee is always on time for work and never misses a day. Lee was also elected historian for the company and keeps scrapbooks that show the history of the company. Lee is the type of committed and dependable employee that this company relies upon. Lee Peterson represents the spirit of Johnson & Sons, Inc.

Company Vision

We will strive to develop reliable telegraph machines and parts that always meet the expectations of our customers. We will work to maintain our place in the industry by producing products with the traditional Johnson & Sons quality for the customers that we have served for years. By hiring dependable employees, we will ensure that workers in all divisions will continue the traditions of the company. We strive to maintain the traditions and customer satisfaction that are the hallmark of our company.

APPENDIX B:
GOAL MANIPULATION

Manufacturing Division

In the Manufacturing Division, our job is to construct the satellite. The station where you will work is responsible for assembling the outside casing of the satellite. You and your partner will work together. Each of you have been assigned a different component to build. After building your own component, you will work with your partner to build a third component. Finally, you and your partner will construct the final unit. The final unit will be shipped to our customers. New Directions, Inc. depends on the production of the final units. The final units must be completed on time and have high quality in order to satisfy our customers.

Goals

Each employee is expected to build the individual components and then use them to construct the final units with his/ her partner. The individual components and the final units must all be completed. In order to meet our production demands, all employees must work hard to prepare the satellite casings for our customers.

Goals - Worker #1

Your goal is to produce as many completed units of Component #1 in one production session that you can. Your performance on the job will be measured by how many units of Component #1 you complete.

Goals - Worker #2

Your goal is to produce as many completed units of Component #2 in one production session that you can. Your performance on the job will be measured by how many units of Component #2 you complete.

One production session will last for 20 minutes. Use the standard operating procedures and pictures to do your work.

APPENDIX C:
STANDARD OPERATING PROCEDURE

Job Details & Responsibilities

This page will give you some more information about how to do your job. Please read it carefully.

I. Job Guidelines

1. All workers are expected to construct the components assigned to them using the standard operating procedures for your Worker #.
2. All workers are expected to work with their partner to construct the final unit. You will build your components and your partner will build his or her components and then together you will build the third component and the final unit. Start the process over again.
3. Pictures of each of the components and the final unit are included to demonstrate what the products look like.
4. The standard operating procedures include different instructions for Worker #1 and Worker #2. Please make sure that you are completing the instructions assigned to you.
5. You are free to talk and interact with your partner during the production sessions. However, the experimenter cannot answer many questions.
6. You will have the manuals available to you during the production sessions.

II. Job Responsibilities

In addition to constructing your assigned component, there are a few special tasks assigned to each worker. The other worker will use a work order to request that you do the task. You are expected to coordinate these responsibilities as well as continue constructing your components. The responsibilities are as follows:

Worker 1: Worker 1 is responsible for inserting all fins onto rods. As work orders come in from other workers, Worker 1 will attach the fin to the rods (provided by the other worker) and pass them and the work order back to the partner.

Worker 2: Worker 2 is responsible for capping all rods. As work orders come in from other workers, Worker 2 will attach a close-ended cap to the rods (provided by the other worker) and pass them and the work order back to the other worker.

Standard Operating Procedure

Worker 1

Use the following instructions to complete your part of the unit.

Component # 1

1. Remove the following parts from inventory:
    - 8 blue rods (R-1)
    - 4 wheels (S-6)
    - 4 regular spools (S-1)
    - 4 orange rods (R-3)

2. Insert a blue rod (R-1) into the hole of a wheel (S-6). Repeat process three more times.
3. Put a regular spool (S-1) onto the empty end of each of the four blue rods (R-1) from step #4.
4. Insert a blue rod (R-1) into the other side of the hole on the regular spool (S-1).
5. Fill out a Work Order (Form 1) that requests Worker #2 to cap the four orange rods (R-3) with close-ended caps (C-1). Give the work order and four orange rods (R-3) to Worker #2.
6. Receive the four capped orange rods (R-3) and the Work Order. Place a check on the last line (completion line) of the Work Order and place it in file box.
7. Remove the following parts from inventory:
    - 8 red rods (R-4)
    - 4 regular spools (S-1)

8. Insert one of the capped, orange rods (R-3) into a side hole of a regular spool (S-1). Repeat three more times putting one rod on each spool.
9. Take the spool and rod combination from step 4 and connect it to the spool combination from Step 8. Repeat for all four rods. Confirm that the capped, orange rods (R-3) are pointing out diagonally as seen in the picture for Component #1.
10. Connect the four rod structures from Step 9 together with 4 red rods (R-4) as seen in the diagram.

11. Insert a red rod (R-4) from the top hole of the regular spool (S-1). Repeat for all four spools.
12. Set Component #1 aside and start working on Component #3.

Component # 3 (Shared Assembly with Worker # 2)

1. Remove the following parts from inventory:
    - 1 red rod (R-4)
    - 2 green rods (R-2)
    - 1 yellow fin (F-2)
    - 1 fitting (F-3)
    - 1 joint (J-1)
    - 1 spool (S-1)

2. Place the fitting (F-3) over one end of one of the green rods. Make sure that the end of the green rod extends beyond the connector.
3. Attach the fin (F-2) to the end of the green rod from step #2 near the fitting.
4. Attach the two green rods to the center hole of the spool. The green rod with the fin should be on top.
5. Put the joint (J-1) on the end of the red rod (R-4).
6. Connect the red rod to a side hole of the spool (S-1).
7. Pass the partially completed component to Worker #2.
8. Wait for Worker #2 then begin working on Final Assembly.

Final Assembly (Shared Assembly with Worker # 2)

1. Work with Worker #2 in order to combine the components into the final unit as seen in the picture.
2. Connect the four spools (S-1) from component 2 to the upright red rods from component 1.
3. Place component 3 on component 2. The joints should fit into the red rods on component 2. The lower green rod of component 3 should go through the center hole of the spools in component 2.
4. Put the final assembly in the Completed Unit area.
5. Return to the beginning of the procedure. Begin working on another unit.

Standard Operating Procedure
Worker 2

Component # 2

1. Remove the following parts from inventory:
    - 2 green rods (R-2)
    - 6 orange rods (R-3)
    - 2 five-hole spools (S-5)
    - 1 close-ended cap (C-1)
    - 1 open-ended cap (C-2)

2. Insert a green rod (R-2) in one of the outer holes in the base of the spool (S-5). Insert the second green rod (R-2) in the hole across from the first rod.
3. Insert the other end of the green rods (R-2) into another five-holed spool (S-5).
4. Insert four orange rods (R-3) into every hole on the side of the first five-hole spool (S-5).
5. Insert an orange rod (R-3) into one of the holes on the side of the second five-hole spool (S-5).
6. Place the open-ended cap (C-2) over the other end of the rod from step #5. Make sure that the end of the rod sticks through the open-ended cap.
7. Place the close-ended cap (C-1) over the end of the orange rod (R-3) from step #6.
8. Fill out a Work Order (Form 1) that requests Worker #1 to place a fin on an orange rod (R-3). Give the work order and the orange rod (R-3) to Worker #1.
9. Receive the orange rod (R-3) with the fin (F-2) attached and the Work Order. Place a check on the last line (completion line) of the Work Order and place it in file box.
10. Insert the orange rod (R-3) from step #9 into the opposite hole in the spool from the rod from step #7.
11. Remove the following parts from inventory:
    - 6 blue rods (R-1)
    - 4 red rods (R-4)
    - 4 regular spools (S-1)
    - 1 five-hole spool (S-5)

12. Insert two of the blue rods (R-1) in the top of the first spool from step #10 (one with the cap and fin). Place the blue rods (R-1) in the same holes as the green rods below.
13. Place the remaining five-hole spool (S-5) onto the free ends of the two blue rods (R-1).
14. Insert 4 blue rods (R-1) into the side holes of the last five-hole spool (S-5) from step #13.
15. Place a regular spool (S-1) on the end of each blue rod from step #15. Insert a red rod out of the top of each of the four regular spools.
16. Set aside component #2.

Component # 3 (Shared Assembly with Worker # 1)

1. Remove the following parts from inventory:
    - 3 red rods (R-4)
    - 3 joints (J-1)
2. Receive the partially completed component #3 from Worker #1.
3. Insert a joint (J-1) over the end of one of the red rods (R-4).
4. Insert the other end of the red rod (R-4) into the regular spool (S-1) across from the other red rod.
5. Repeat steps #3 and #4 for the other two red rods (R-4) and joint (J-1). Place the red rods at 90 degree angles to each other around the edge of the spool.
6. Set aside Component #3 then begin working on Final Assembly.

Final Assembly (Shared Assembly with Worker # 1)

1. Work with Worker #1 in order to combine the components into the final unit as seen in the picture.
2. Connect the four spools (S-1) from component 2 to the upright red rods from component 1.
3. Place component 3 on component 2. The joints should fit into the red rods on component 2. The lower green rod of component 3 should go through the center hole of the spools in component 2.
4. Put the final assembly in the Completed Unit area.
5. Return to the beginning of the procedure. Begin working on another unit.

APPENDIX D:
PROGRESS REPORTS

Progress Report

Your goal for the last production session was to complete as many of the final units as you could. Your performance is measured by how many final units you complete.

Indicate how many final units that you and your partner completed during the production session: _____

Progress Report
Worker #1

Your goal for the last production session was to complete as many units of Component #1 as you could. Your performance is measured by how many assigned components you complete.

Indicate how many units of Component #1 you completed during the production session:

_____

Progress Report
Worker #2

Your goal for the last production session was to complete as many units of Component #2 as you could. Your performance is measured by how many assigned components you complete.

Indicate how many units of Component #2 you completed during the production session:

_____

APPENDIX E:
CHANGE MEMOS

Memo

To: All Workers

From: Corporate Headquarters

Re: Change in Schedule

Our largest client has just informed us that they need a rush job on a large special order. With our current production rate, we will not be able to fill this order, so we will have to worker faster and harder. It is critical for our customer service policy and our financial well-being that we meet this demand. Remember the vision of New Directions, Inc.:

Company Vision

We will strive to develop and produce superior, high-quality satellites that always exceed the expectations of our customers. We will work to become the leader in our industry by developing new products and envisioning new ways to use them. By hiring ambitious and creative employees, we will ensure that workers in all divisions will strive to find new and better ways to design, build and market our product. We strive to take our company, our employees and our customers in new directions.

This sudden increase in production means that all of our workers will need to work as hard as they possibly can. Everyone will be expected to do a lot more work in the same amount of time.

All workers will have new, tougher production goals. You are still expected to complete your assigned components as well as the final units.

Goals

Your goal is to work as hard as possible to produce as many completed final units in this production session with your partner that the two of you are capable of producing . Your performance on the job will be measured by how many final units you and your partner assemble.

One production session will last for 20 minutes. Use the standard operating procedures and pictures to do your work.

Memo

To: All Workers

From: Corporate Headquarters

Re: Change in Schedule

Our largest client has just informed us that they need a rush job on a large special order. With our current production rate, we will not be able to fill this order, so we will have to worker faster and harder. It is critical for our customer service policy and our financial well-being that we meet this demand. Remember the vision of Johnson & Sons.

Company Vision

We will strive to develop reliable telegraph machines and parts that always meet the expectations of our customers. We will work to maintain our place in the industry by producing products with the traditional Johnson & Sons quality for the customers that we have served for years. By hiring dependable employees, we will ensure that workers in all divisions will continue the traditions of the company. We strive to maintain the traditions and customer satisfaction that are the hallmark of our company.

This sudden increase in production means that all of our workers will need to work as hard as they possibly can. Everyone will be expected to do a lot more work in the same amount of time. All workers will have new, tougher production goals. You are still expected to complete your assigned components as well as the final units.

New Goals - Worker #1
Your goal is to work as hard as possible to produce as many completed units of Component #1 in this production session that you are capable of producing. Your performance on the job will be measured by how many units of Component #1 you complete.

New Goals - Worker #2
Your goal is to work as hard as possible to produce as many completed units of Component #2 in this production session that you are capable of producing. Your performance on the job will be measured by how many units of Component #2 you complete.

One production session will last for 20 minutes. Use the standard operating procedures and pictures to do your work.

APPENDIX F:
SCALES

Background

Please answer the following background questions on your answer sheets.

1. What is your gender?
   1 = female
   2 = male

2. What is your age?
   1 = less than 18 years
   2 = 18 - 19 years
   3 = 20 - 21 years
   4 = 22-23 years
   5 = greater than 23 years

3. What is your overall grade point average?
   1 = 0 - .9
   2 = 1.0 to 1.9
   3 = 2.0 - 2.9
   4 = 3.0 - 3.9
   5 = 4.0

4. What is your academic class?
   1 = First-year
   2 = Sophomore
   3 = Junior
   4 = Senior
   5 = Fifth-year

5. How well do you know your partner?
   1 = Not at all
   2 = Barely know
   3 = Know somewhat well
   4 = Know very well

Working Style

People approach work in different ways. Think about how you approach your work. Using the scale below, indicate how much you agree with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. I do my best when I'm working on a fairly difficult task.
2. When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work.
3. I try hard to improve on my past performance.
4. The opportunity to do challenging work is important to me.
5. The opportunity to extend the range of my abilities is important to me.
6. The opportunity to learn new things is important to me.
7. I prefer to work on tasks that force me to learn new things.
8. When I fail to complete a difficult task, I plan to try harder the next time I work on it.
9. The things I enjoy the most are the things I do the best.
10. I feel smart when I do something without making any mistakes.
11. I prefer to do things that I can do well rather than things I do poorly.
12. I like to be fairly confident that I can successfully perform a task before I attempt it.
13. I am happiest at work when I perform tasks on which I know that I won't make any errors.
14. I feel smart when I can do something better than most other people.
15. The opinions others have about how well I can do certain things are important to me.
16. I like to work on tasks that I have done well on in the past.

Team Attitudes Scale

Sometimes it may be best when people put the interests of groups ahead of personal desires. At other times it may be best for people to concentrate on what is best for them personally. Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. Only those who depend on themselves get ahead in life.
2. To be superior a person must stand alone.
3. If you want something done right, you've got to do it yourself.
4. What happens to me is my own doing.
5. In the long run the only person you can count on is yourself.
6. Winning is everything.
7. I feel that winning is important in both work and games.
8. Success is the most important thing in life.
9. It annoys me when other people perform better than I do.
10. Doing your best isn't enough; it is important to win.
11. I prefer to work with others in a group rather than working alone.
12. Given the choice, I would rather do a job where I can work alone rather than doing a job where I have to work with others in a group.
13. Working with a group is better than working alone.
14. People should be made aware that if they are going to be part of a group then they are sometimes going to have to do things they don't want to do.
15. People who belong to a group should realize that they are not always going to get what they personally want.
16. People in a group should realize that they sometimes are going to have to make sacrifices for the sake of the group as a whole.
17. People in a group should be willing to make sacrifices for the sake of the group's well-being.
18. A group is more productive when its members do what *they* want to do rather than what the group wants them to do.
19. A group is most efficient when its members do what they think is best rather than doing what the group wants them to do.
20. A group is more productive when its members follow their own interests and concerns.

Task Confidence Scale #1

Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. I am confident that I can perform the task given to me.
2. I can meet the challenges of my role in this task.
3. I am certain that I can manage the requirements of my position for this task.
4. I believe I will fare well in this task if the workload is increased.
5. I am confident that I can cope with my role if the simulation becomes more complex.
6. I am certain I can cope with task components competing for my time.

Goal Commitment Scale #1

Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. It is hard to take this task goal seriously.
2. It is unrealistic for me to expect to reach this task goal.
3. Quite frankly, I do not care if I achieve this task goal or not.
4. I am strongly committed to pursuing this task goal.
5. It would not take much to make me abandon this task goal.
6. I think this task goal is a good goal to shoot for.

Task Attitude Scale

Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. I feel that this task is designed as well as it could be.
2. I wish I had a better procedure for working with my partner.
3. My job runs as quickly as it should.
4. I wish I had a better understanding of what is expected of me.
5. I would prefer to use different parts to build a component.
6. I find the task confusing.
7. I find that every time I start to work on the task I run into obstacles.
8. There are a lot of petty and arbitrary rules associated with this job.
9. The demands made of me with this task are unreasonable.
10. I do not like many of the tasks I have to do.
11. I often feel frustrated while doing this task.

Partner Interaction Scale #1

Some people work well as teammates and others do not work well together. Think about your interaction with your partner on this task. Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. My partner and I would probably get along well as teammates.
2. My partner would say that he/she and I would probably get along well as teammates.
3. I could probably count on my partner to help me out.
4. My partner would say that he/ she could count on me to help out.
5. My partner's ability would probably make him/ her an excellent teammate.
6. My partner would say that my ability would probably make me an excellent teammate.
7. I would probably like my partner as a coworker.
8. My partner would say that he/ she would probably like me as a coworker.
9. I could probably trust my partner to stick by me if things got difficult.
10. My partner would say that he/ she could probably trust me to stick by him/ her if things got difficult.
11. My partner would probably do an excellent job on a team.
12. My partner would say that I would probably do an excellent job on a team.
13. My partner and I would probably have a good working relationship.
14. My partner would say that he/ she and I would probably have a good working relationship.

Task Satisfaction Scale

Using the scale below, indicate how much you **agree** with the following statements. Write your answers on the answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. I enjoyed working on this task.
2. I feel fairly satisfied with the kind of work I did.
3. Most people will be fairly pleased with this task.
4. I am satisfied with the chances I had to learn new things in this task.
5. I worked well with my partner.
6. I am pleased with the method I used to do this task.
7. I am satisfied with the freedom I had to make changes.
8. I am glad that I had a chance to work on this task.
9. Overall, I am satisfied with the way I dealt with this task.

Job Change Scale

Compare how you did the task compared to how the directions in the procedure manual. Using the scale below, indicate how much you **agree** with the following statements. Write your answers on your answer sheet.

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Neither Agree nor Disagree
5. Slightly Agree
6. Agree
7. Strongly Agree

1. I did the job differently than specified in the standard operating procedures.
2. I followed the procedure precisely as described in the manual.
3. I put my parts together in an order different from the procedure.
4. I developed a new method for gathering parts.
5. My partner and I distributed the work in a new way.
6. I made my job less complicated.
7. I developed new rules for doing my job.
8. I changed the tasks of my job.
9. I did the job differently than specified in the manual.
10. I made the task less confusing.

APPENDIX G:
VIDEOTAPE CODING SHEET

Guidelines for Video Coding Sheet

1. You need to devote full attention to the videotapes when you are coding. Some of the behaviors that you are looking for are small and subtle. It is important that you catch them. The tapes will have inter-rater reliabilities done on them, so we must have consistency.

2. You will watch the tapes to see if the workers do any of the 15 behaviors listed on the coding sheet.

3. There is a column for Worker #1 and a column for Worker #2 in each time period. Each worker will get a separate score for each time period.

4. If a worker performs a behavior, then he or she receives one point. Place a mark in the box for that behavior for the worker. Each worker can only get one point for each behavior in each production session.

5. Give the point to the worker who initiates the action unless the workers do the behavior independently.

6. The third column in each time period is labeled "RN" which stands for role negotiation. Role negotiation refers to whether or not the partners discussed a possible change before initiating it. When a role innovative behavior occurs, give the workers a point for role negotiation **IF** the new behavior is discussed. (i.e., "Why don't I start capping my own rods?" or "Do you think we should stop filling out the work forms?"). Do not give the workers a point if the role innovative behavior is not discussed.

7. Workers can get role negotiation points even if they do not change their behavior. If the workers discuss a change, but decide not to do it, they still get a point for role negotiation. So you must pay attention to all of their task-relevant discussions.

8. Add up the points for each column and put the results in the Total row at the bottom of the sheet.

9. Remember that we have to respect the confidentiality of the participants. If you know any of the participants, do not discuss their performance. Sometimes participants will have unusual non-task related conversations, but we have an obligation not to repeat the conversations.

10. If you have any specific questions, then write them down and ask me later.

Video Coding Sheet: Tinker Toy Assembly Task

Subj numbers _____
Tape number _____
Coder: _____
Date: _____

	Session 1			Session 2		
Behavior	**W2**	**W1**	**RN**	**W2**	**W1**	**RN**
1. Worker moves a part bin(s) to make parts more accessible for self. *Must physically move bin.*						
2. Worker removes parts from inventory piece by piece or in uncounted clumps. *Any other unique part removal/ usage.*						
3. Worker takes or gives needed parts (caps or fins) to partner.						
4. Worker starts capping own rods or putting on own fins.						
5. Worker stops filling out work order forms.						
6. Worker stops using written procedures & uses pictures or models to guide work.						
7. Worker works on putting several individual components together at one time. *(i.e. makes enough legs for two Comp #1's without making a full Comp#1 first)*						
8. Worker begins constructing more individual components before completing a final unit. *(i.e. makes two Comp #1's without putting the first one into a final unit)*						
9. Worker decides not to make final assembly at all.						
10. Worker helps partner with the partner's assignment.						
11. Worker corrects a mistake made by the partner.						
12. Worker goes back to correct a mistake he/ she made on earlier unit *(one that had been finished and set aside).*						
13. Worker takes control of task and tells partner what to do.						
14. Worker completes Component # 3 without help.						
15. Worker completes Final Unit without help.						
Totals						

LIST OF REFERENCES

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Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), Research in Organizational Behavior, (Vol. 10, pp. 123-167). Greenwich, CT: JAI Press.

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. Journal of Educational Psychology, 84, 261-271.

Ames, C. & Archer, J. (1988). Achievement goals in the classroom: Student's learning strategies and motivation processes. Journal of Educational Psychology, 80, 260-267.

Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgments. In H. Guetzkow (Ed.), Groups, Leadership, and Men. New Brunswick, NJ: Rutgers University Press.

Ashforth, B. E., & Saks, A. M. (1996). Socialization tactics: Longitudinal effects on newcomer adjustment. Academy of Management Journal, 39 (1), 149-178.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. Psychological Bulletin, 117, 497-529.

Brett, J. M. (1984). Job transitions and personal and role development. In K. M. Rowland & G. R. Ferris (Eds.), Research in Personnel and Human Resources Management, (Vol. 2 , pp. 155-185). Greenwich, CT: JAI Press.

Burningham, C., & West, M. A. (1995). Individual, climate and group interaction processes as predictors of work team innovation. Small Group Research, 26 (1), 106-117.

Button, S. B., Mathieu, J. E., & Zajac, D. M. (1996). Goal orientation in organizational research: A conceptual and empirical foundation. Organizational Behavior and Human Decision Processes, 67 (1), 26-48.

Cohen, J. & Cohen, P. (1983). Applied Multiple Regression/ Correlation Analysis for the Behavioral Sciences (2nd edition). Lawrence Erlbaum Associates: Hillsdale.

Cook, J. D., Hepworth, S. J., Wall, T. D. & Warr, P. B. (1981). The Experience of Work. Academic Press: London.

Dansereau, F., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations: A longitudinal investigation of the role making process. Organizational Behavior and Human Performance, 13, (1), 46-78.

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. Advances in Experimental and Social Psychology, 13, 39-80.

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. Journal of Educational Psychology, 84, 290-299.

Dweck, C. S. (1986). Motivational processes affecting learning. American Psychologist, 41, 1040-1048.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. Psychological Review, 95, 256 - 273.

Elliot, E. S. & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. Journal of Personality and Social Psychology, 54, 5 - 12.

Ettlie, J. E., & Reza, E. M. (1992). Organizational integration and process innovation. Academy of Management Journal, 35, (4), 795-827.

Farr, J. L. & Ford, C. M. (1990). Individual innovation. In M. A. West & J. L. Farr (Eds.), Innovation and Creativity at Work, (pp. 63-80). Chichester: John Wiley & Sons Ltd.

Farr, J. L., Hofmann, D. A., & Ringenbach, K. L. (1993). Goal orientation and action control theory: Implications for industrial and organizational psychology. International Review of Industrial and Organizational Psychology, 8, 193-232.

Fisher, C. D. (1986). Organizational socialization: An integrative review. In K. M. Rowland & G. R. Ferris (Eds.), Research in Personnel and Human Resources Management, (Vol. 4 , pp. 101-145). Greenwich, CT: JAI Press.

Galbraith, J. R. (1982). Designing the Innovating Organization. Organizational Dynamics, 10, (3), 5-25.

Graen, G. B., & Scandura, T. A. (1987). Toward a psychology of dyadic organizing. In B. M. Staw & L. L. Cummings (Eds.), Research in Organizational Behavior, (Vol. 9 , pp. 175-208). Greenwich, CT: JAI Press.

Greenberger, D. B. (1991). Responses to inadequate personal control in organizations. Journal of Social Issues, 47, (4) 111-128.

Guzzo, R. A., & Shea, G. P. (1992). Group Performance and Intergroup Relations in organizations. In M. D. Dunnette & L. Hough (Eds.), Handbook of Industrial and Organizational Psychology, (2nd ed.), (Vol. 3, pp. 269-313). Palo Alto, CA.: Consulting Psychologists Press.

Hackman, J. R. (1992). Group influences on individuals in organizations. In M. D. Dunnette & L. Hough (Eds.), Handbook of Industrial and Organizational Psychology, (2nd ed.), (Vol. 3, pp. 199-267). Palo Alto, CA.: Consulting Psychologists Press.

Hackman, J. R., & Oldham, G. R. (1980). Work Redesign. Reading, MA: Addison-Wesley. Chapter 4, pp. 71-97.

Hollander, E. P. (1958). Conformity, status, and idiosyncrasy credit. Psychological Review , 65, 117-127.

Hollenbeck, J. R., Klein, H. J., O'Leary, A. M., & Wright, P. M. (1989). Investigation of the construct validity of a self-report measure of goal commitment. Journal of Applied Psychology, 74, 951-956.

Hui, C. H., & Villareal, M. J. (1989). Individualism-Collectivism and psychological needs. Journal of Cross-Cultural Psychology , 20 (3), 310-323.

Hulin, C. L., Roznowski, M., & Hachiya, D. (1985). Alternative opportunities and withdrawal decisions: Empirical and theoretical discrepancies and an integration. Psychological Bulletin , 97 (2), 233-250.

Ilgen, D. R., & Hollenbeck, J. R. (1991). The structure of work: Job design and roles. In M. D. Dunnette & L. Hough (Eds.), Handbook of Industrial and Organizational Psychology, (2nd ed.), (Vol. 2, pp. 165-207). Palo Alto, CA.: Consulting Psychologists Press.

Jabri, M. M. (1991). The development of conceptually independent subscales in the measurement of modes of problem solving. Educational and Psychological Measurement , 51, 975-983.

James, L. R., James, L. A., & Ashe, D. K. (1990). The meaning of organizations: The role of cognition and values. In B. Schneider (Ed.), Organizational Climate and Culture, (pp. 40-84). San Francisco: Jossey-Bass.

James, L. R., & Jones, A. P. (1974). Organizational climate: A review of theory and research. Psychological Bulletin , 81 (12), 1096-1112.

Janis, I. L. (1982). Groupthink (2nd ed.). Boston: Houghton Mifflin.

Jones, G. R. (1986). Socialization tactics, self-efficacy, and newcomer's adjustments to organizations. Academy of Management Journal , 29 , 262-279.

Kanfer, R. (1991). Motivation theory and industrial and organizational psychology. In M. D. Dunnette & L. Hough (Eds.), Handbook of Industrial and Organizational Psychology, (2nd ed.), (Vol. 2, pp. 75-170). Palo Alto, CA.: Consulting Psychologists Press.

Kanter, R. M. (1983). The Change Masters. New York: Simon and Schuster.

Katz, D., & Kahn, R. L. (1978). The Social Psychology of Organizations. New York: Wiley.

Kernan, M. C., Bruning, N. S. & Miller-Guhde, L. M. (1994). Individual and group performance: Effects of task complexity and information. Human Performance, 7 (4), 273-289.

Kidwell, R. E., & Bennett, N. (1993). Employee propensity to withhold effort: A conceptual model to intersect three avenues of research. Academy of Management Review , 18, 429-456.

Kiernan, M. J. (1993). The new strategic architecture: learning to compete in the twenty-first century. Academy of Management Executive , 7 (1), 7-21.

King, N. (1990). Innovation at work: the research literature. In M. A. West & J. L. Farr (Eds.), Innovation and Creativity at Work, (pp. 15-59). Chichester: John Wiley & Sons Ltd.

Kirton, M. J. (1976). Adapters and Innovators: A description and measure. Journal of Applied Psychology, 6, 622-629.

Kozlowski, S. W. J., Gully, S. M., Smith, E. M., Nason, E. R., & Brown, K. G. (1995, May). Sequenced mastery training and advanced organizers: Effects on learning, self-efficacy, performance and generalization. Paper presented at the Tenth Annual Conference of the Society for Industrial and Organizational Psychology, Orlando, FL.

Kozlowski, S. W. J., & Hults, B. M. (1987). An exploration of climates for technical updating and performance. Personnel Psychology , 40, 539-563.

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. Organizational Behavior and Human Decision Processes , 50, 212-247.

Locke, E. A., Durham, C. C., Poon, J. M. L. & Weldon, E. (in press). Goal setting, planning, and performance on work tasks for individuals and groups In S. L. Friedman & E. K. Scholneck (Eds.), Why, How and When do we Plan? The Developmental Psychology of Planning. Hillsdale, NJ: Lawrence Erlbaum Associates.

Locke, E. A., & Latham, G. P. (Eds.) (1990). A Theory of Goal Setting and Task Performance. Englewood Cliffs, NJ: Prentice Hall.

Maas, J. B. (1965). Pattern scaled expectation interview: Reliability studies on a new technique. Journal of Applied Psychology, 49, 431-433.

Mitchell, T. R., & Silver, W. S. (1990). Individual and group goals when workers are interdependent: Effects on task strategies and performance. Journal of Applied Psychology , 75, 185-193.

Morris, M. H., Avila, R. A., & Allen, J. (1993). Individualism and the modern corporation: Implications for innovation and entrepreneurship. Journal of Management , 19 (3), 595-612.

Nason, E. R. (1995). Horizontal Team Member Exchange (HMX): The effects of dyadic relationship quality on team processes and outcomes. Unpublished doctoral dissertation, Michigan State University, East Lansing.

Nicholson, N. (1984). A theory of work role transitions. Administrative Science Quarterly , 29 , 172-191.

O'Leary, A. M., Martocchio, J. J., & Frink, D. D. (1994). A Review of the influence of group goals on group performance. Academy of Management Journal , 37 (5), 1285-1301.

Schein, E. H. (1971). Occupational socialization in the professions: The case of role innovation. Journal of Psychiatric Research, 8, 521-530.

Schneider, B. (1985). Organizational Behavior. Annual Review of Psychology, 36, 573-611.

Schneider, B., & Bowen, D. E. (1985). Employee and customer perceptions of service in banks: Replication and extension. Journal of Applied Psychology, 70 (3), 423-433.

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. Academy of Management Journal , 37 (3), 580-607.

Seers, A. (1989). Team-member exchange quality: A new construct for role-making research. Organizational Behavior and Human Decision Processes , 43, 118-135.

Shamir, B. (1990). Calculations, values, and identities: The sources of collectivistic work motivation. Human Relations, 43, 313-332.

Spector, P. E. (1975). Relationships of organizational frustration with reported behavioral reactions of employees. Journal of Applied Psychology, 60, 635-637.

Staw, B. M. (1990). An evolutionary approach to creativity and innovation. In M. A. West & J. L. Farr (Eds.), Innovation and Creativity at Work, (pp. 287-308). Chichester: John Wiley & Sons Ltd.

Staw, B. M., & Boettger, R. D. (1990). Task revision: A neglected form of work performance. Academy of Management Journal , 33 (3), 534-559.

Van De Ven, A. H. (1986). Central problems in the management of innovation. Management Science, 32, (5), 590-607.

Vance, R. J., Kuhnert, K. W., & Farr, J. L. (1978). Interview judgments: Using external criteria to compare behavioral and graphic scale ratings. Organizational Behavior and Human Performance, 22, 279-294.

Van Dyne, L., Cummings, L. L., & Mclean Parks, J. (1995). Extra-role behaviors: In pursuit of construct and definitional clarity (A bridge over muddied waters). In B. M. Staw & L. L. Cummings (Eds.), Research in Organizational Behavior, (Vol. 17 , pp. 215-285). Greenwich, CT: JAI Press.

Van Maanen, J. (1978). People processing: Strategies of organizational socialization. Organizational Dynamics, 7 (1), 19-36.

Van Maanen, J., & Schein E. H. (1979). Toward a theory of organizational socialization. In B. M. Staw (Ed.), Research in Organizational Behavior, (Vol. 1 , pp. 209-264). Greenwich, CT: JAI Press.

Wagner, J. A. (1995). Studies of Individualism-Collectivism: Effects on cooperation in groups. Academy of Management Journal , 38 (1), 152-172.

Wagner, J. A. & Moch, M. K. (1986). Individualism-Collectivism: Concept and Measure. Group & Organization Studies , 11 (3), 280-303.

Weingart, L. R. (1992). Impact of group goals, task component complexity, effort, and planning on group performance. Journal of Applied Psychology , 77 (5), 682-693.

Weingart, L. R. & Weldon, E. (1991). Processes that mediate the relationship between a group goal and group member performance. Human Performance , 4 , 33-54.

Weldon, E. & Weingart, L. R. (1988, August). A theory of group goals and group performance. Paper presented at the meeting of the Academy of Management, Anaheim, CA.

West, M. A. (1987a). A measure of role innovation at work. British Journal of Social Psychology , 26 , 83-85.

West, M. A. (1987b). Role Innovation in the world of work. British Journal of Social Psychology , 26 , 305-315.

West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), Innovation and Creativity at Work, (pp. 309-333). Chichester: John Wiley & Sons Ltd.

West, M. A. & Rushton, R. (1989). Mismatches in the work-role transition. Journal of Occupational Psychology , 62 , 271-286.