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A Hierarchical Construct of Self-Management Leadership to Quality of Work Life and Perceived Work Group Effectiveness

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Abstract

This study validates the Self-Management Leadership theory as operationalized by the Self-Management Leadership Questionnaire (Manz & Sims, 1987) in a large telephone company. The sample for this study is 390 self-managing and 412 traditionally managed employees and 94 external leaders from 58 self-managing and 60 traditionally-managed teams. Results support Manz and Sims' six-factor pattern at the first order level, and, in addition, identify a common second order factor. The hierarchical factor structure is invariant in employee and leader samples drawn from both self-managing and traditionally managed work teams, suggesting that the construct of self-managing leadership is similar for members and leaders of both types of teams. Respondents perceive slightly more self-management leadership behaviors in the self-managing than the traditional work teams. Respondents evaluate self-managing work teams as more effective than traditional work teams, and this difference is moderate in size. Self-managing leadership behaviors are positively associated with QWL (mainly employee satisfaction) and self-rated effectiveness for both self-managing and traditional teams. In general, self-managing work teams are not that different from traditionally managed groups in the relationship of self-managing leadership to outcomes. We conclude that self-management leadership is a hierarchical concept, constituted of specific strategies as well as a general orientation toward empowering employees. These leadership behaviors are applicable to managing both traditional and self-managing work teams.

A Hierarchical Construct of Self-Management Leadership and Its Relationship to Quality of Work Life and Perceived Work Group Effectiveness

Self-managing teams hold great interest for contemporary researchers and practitioners. A recent survey of Fortune 1000 firms found that 67% use these teams with at least some employees, and that they are one of the fastest growing forms of employee involvement (Lawler, Mohrman, & Ledford, 1995). Four decades of research indicate that such groups often exhibit high performance and high member quality of work life (Beekun, 1989; Cohen; 1994, Goodman, Devadas, & Hughson, 1988), but many theoretical and practical issues are unresolved concerning how they should be led.

Manz and Sims (1987) in a study of the leadership self-managing work teams in a manufacturing plant identified key leader behaviors encouraging self-management and developed a Self-Management Leadership Questionnaire (SMLQ) that measured them. Apart from Manz and Sims (1987) initial validation efforts, no other published study has evaluated the validity of the construct of self-management leadership. The major purpose of our study is to perform this construct validation.

Members of self-managing teams (known also as autonomous work groups, semi-autonomous work groups, and self-regulating work groups) are interdependent, work on group tasks that are high in autonomy and identity, and often have considerable authority to make decisions concerning personnel and other matters for the group. However, "self-management" authority is not absolute, and the term does not imply the absence of direct management. Even though the role of the leader of a self-managing group may differ from that of conventional supervisors, most self-managing groups have a formal leader who is located above the group in the organizational hierarchy (Manz & Sims, 1986).

Both researchers and practitioners argue that leadership is a key contingency variable explaining the success or failure of self-managing teams (Ketchum & Trist, 1992; Lawler, 1986; Manz & Sims, 1986, 1987; Mills, 1983; Walton & Hackman, 1986; Wellins & Byham, 1991). For example, Lawler (1986) indicates that reluctance of external leaders to engage in needed new behaviors is one of the major causes of failure in unsuccessful self-managing teams. Manz and Sims (1986) said that, "In

our investigations of self-managed work groups, we have found ambiguity and confusion about the role of the appointed external leaders to be the single most troublesome issue of implementation" (p. 144).

Exactly what leader behaviors relate to the effectiveness of self-managing teams? Do these behaviors differ from those relating to effectiveness in conventional groups? Theoretical perspectives on these questions are relatively rare and underdeveloped. Manz and Sims (Manz & Sims, 1980, 1982, 1984, 1986, 1987, 1989; Manz, 1986; Sims & Manz, 1982; Manz, Keating, & Donnellon, 1990) have conducted by far the most serious theoretical and empirical work on the subject of leadership in self-managing teams. However, their theory and empirical work have received surprisingly little attention or scrutiny from other researchers.

The work of Manz and Sims is rooted in social learning theory (Bandura, 1977), which we discuss below. The keystone test of their theory is a study (Manz & Sims, 1987) in a manufacturing plant that used self-managing teams. On the basis of observations of what external leaders did to facilitate employee self-management, they developed a 22-item questionnaire called the Self-Management Leadership Questionnaire (SMLQ). From a principal components analysis with varimax rotation, they extracted seven factors from the employee responses to the SMLQ. The first six factors corresponded to the six leader behaviors that the authors had previously identified from observing the external leaders. These behaviors are encouraging self-expectation, rehearsal, self-goal setting, self-criticism, self-reinforcement, and self-observation/evaluation. The seventh factor was "uninterpretable" (Manz & Sims, 1987, p. 115). The authors found positive correlations between self-managing leadership behaviors and perceived leadership effectiveness. Manz and Sims also measured other leader behaviors derived from other theories, but chose to focus on self-managing leadership.

Although results of the study are encouraging, the research has several key limitations that reflect its exploratory character. The study has not been replicated in other organizations. Manz and Sims (1987) performed construct validation using the same sample of employees from which the questionnaire had been developed. All groups in the study were self-managing, leaving open the question of whether the leadership behaviors the authors identified are present and are associated with

effectiveness for traditional groups as well. Manz and Sims also did not explore external leader perceptions of their behaviors to discover whether these were consistent with employee perceptions of the external leader behaviors. Finally, the original study measured the outcome of perceived leadership effectiveness, but did not examine the impact of leadership on other outcome criteria.

The present study addresses each of these limitations. It provides a theoretical framework for the empirical validation of self-management leadership theory by assessing the validity of the SMLQ and further develops the construct of self-management leadership. The study compares samples of self-managing work teams and traditional work groups, compares leader and member perceptions, and uses team effectiveness and team member quality of work life (QWL) as outcome criteria.

Theoretical Frame of SMLQ

Bandura's social learning theory is the theoretical foundation for Manz and Sims' self-management theory (Manz, 1986). The essence of social learning theory lies in its integration of cognitive evaluation with environmental contingencies as the determinants of human behavior (Bandura, 1977). Behavior is caused and maintained not only by the consequences arising from external sources--e.g., externally inflicted reward and punishment--but also by the individual's self-generated evaluative consequences that regulate behavior internally. In organizations, environmental contingencies are represented by the control systems an organization imposes on its members, namely the identification of appropriate behavior and performance standards, the evaluation mechanisms, and various means to monitor, coordinate, and reinforce the desired behavior (Lawler & Rhode, 1976). Organizational members' internal control systems represent the cognitive component of the framework. Employees generate their own performance standards, conduct self-evaluation, and regulate their behavior accordingly (Manz, 1986; Bandura, 1977). Employees also possess values, beliefs, and long-term goals (Manz, 1986). In social learning theory, employees' self-control systems directly determine behaviors, while organizational control systems are effective in shaping behavior to the extent that they influence members' self-regulating systems.

Manz (1986) points out that the self-system is the ultimate control for managing behaviors; consequently, recognizing and encouraging employees' self-control systems provides a more viable means for controlling behavior than overreliance on organizational controls. This self-control process is called self-management (Manz, 1986; Mills, 1983). Self-management is the active control by employees over their work environment and themselves that results in productive goal-oriented behaviors. Although Manz's theoretical work mainly addressed individual self-leadership, Manz and Sims (1987) study extrapolates to the team as the unit of analysis. Self-managing work teams are responsible for regulating the collective behavior of their members toward productive ends. A leader's role in a self-management situation lies in facilitating the development of self-controls by employees so that they can successfully manage their work activities with fewer organizational controls.

Drawing from this theoretical orientation, the SMLQ aims at capturing the kinds of leader behaviors that facilitate the development of employee self-control systems. The SMLQ does not measure personality attributes of a leader, nor the specific responsibilities required to manage a work group. Its purpose is to measure the kinds of behaviors suggested by social learning theory as conducive to the development of employee self-regulation.

The specific self-managing behaviors that the leader encourages include self-observation, self-goal setting, incentive modification (both self-reinforcement and self-criticism), rehearsal, and self-expectation (Manz, 1986; Manz & Sims, 1987). Self-observation is the gathering of information regarding the groups' activities and performance, so that corrective action can be taken. Self-goal setting is the establishment of specific, challenging yet achievable goals by the work group (Locke, Shaw, Saari, & Latham, 1981). Self-reinforcement and self-criticism are the self-administration of rewards and criticism by the group and its members to increase desirable and reduce undesirable behaviors (Mahoney & Arnkoff, 1978; Manz & Sims, 1987). According to social learning theory, these behaviors are the building blocks of a self-regulating system.

Manz and Sims' observational study (1987) found that external leaders of self-managing teams encouraged and facilitated their employees to use these six behavioral strategies, providing empirical

support for the development of the SMLQ. In their later work, they used the term "SuperLeadership" not only to describe the cluster of behavioral strategies but also cognitive strategies that leaders use to encourage self-management (Manz & Sims, 1989). This study assesses the validity of the SMLQ, which was developed prior to considering cognitive strategies as part of self-leadership. In the section that follows, we propose research hypotheses regarding the validity of the SMLQ.

Research Hypotheses

We hypothesize that the SMLQ, which Manz and Sims derived from observations in a single manufacturing plant, would be applicable to another organization. Thus, we hypothesize:

1. The internal structure of the SMLQ will reveal the same six dimensions when tested using a sample of 390 self-managing employees from a large telephone company.

We hypothesize that there is a general construct of encouraging self-management leadership that is broader in scope than the six behavioral strategies measured by the SMLQ. If found, this general construct is consistent with Manz and Sims' later construct of SuperLeadership, leading others to lead themselves. A broader construct can be identified by a second-order factoring procedure (Gorush, 1983). A common second-order factor would account for the high intercorrelations among the six primary factor scores that Manz and Sims' found in the original study (C. Manz, personal communication, August 1991) and that we also found. Factor scores would not correlate unless a common determiner or influence acted upon them representing a higher stratum of information (Cattell, 1973). Finding a second-order factor is a necessary but not sufficient step for identifying a general construct of encouraging self-management leadership. There can be other interpretations of the meaning of a higher order factor. Our second hypothesis is:

2. There is a general construct of encouraging self-management leadership.

Another validity issue is whether the factorial structure of SMLQ is invariant across two populations of self-managing and traditionally managed employees. One possibility is that the factorial structure, or interrelations of the questionnaire items that make up SMLQ, is the same for employees from both self-managing and traditionally managed work teams. These employees and their external

leaders are of comparable age, education, and work experience, and belong to the same organization that espouses a participative management philosophy. Employees from both kinds of managerial systems are exposed, to some degree, to organizational as well as self-generated controls. As Manz and Sims (1980, 1989) point out, self-management and traditional managerial control systems are not mutually exclusive. Elements of self-management exist even in situations that have the most intensive organizational controls (Manz & Sims, 1980), whereas formal leadership still plays important roles in self-regulated situations (Mills, 1983).

On the other hand, for the groups that are not self-managing, it is possible that the members have not sufficiently developed self-managing concepts, and that the cognitive structure represented by the questionnaire factor structure may not exist. The traditionally-managed employees and their supervisors may not relate to the items that measure self-managing leadership in the same way as those who have experienced self-management.

These contrasting positions can be tested. Thus, our hypothesis is:

3. The internal structure of the SMLQ is the same for members of traditionally-managed work teams as members of self-managing work teams.

What we expect to be different between self-managing work teams and traditionally managed groups is the degree to which their work groups and leaders emphasize self-regulation versus organizational control. Members of self-managing work teams are likely to perceive their external leaders as encouraging more self-managing behaviors than employees of traditional groups perceive their supervisors to do. In addition, the external leaders of the self-managing groups are likely to view themselves as encouraging more self-managing behaviors than the supervisors of traditional groups do. The literature further leads us to expect higher levels of self-management leadership as well as QWL and perceived work group effectiveness in the self-managing work teams. Our hypotheses are:

4. Self-managing work teams perceive their external leaders as encouraging more self-managing behaviors than do traditionally-managed groups.

5. Leaders of self-managing teams perceive themselves as encouraging more self-managing behaviors than do supervisors of traditionally-managed groups.
6. Self-managing work teams will be rated higher in QWL and team effectiveness than traditionally-managed groups.

These relationships help demonstrate validity only if there are other areas where we expect the self-managing teams to score the same or lower than the traditionally-managed groups. We expected self-managing work team members to evaluate pay equity the same or lower than members of traditionally-managed groups. The company was unionized and job classifications and pay grades were strictly determined by union contract. Employees in self-managing work teams were paid exactly the same as their counterparts in traditionally-managed groups. If anything, we might expect employees in self-managing teams to feel a sense of pay inequity because they were not paid for their additional responsibilities (Lawler, 1986). The union had not been involved in the decision to implement self-managing work teams and it took a neutral stance, neither supporting nor interfering with the adoption of teams. Thus, we expected the union to not differentiate in the recognition it provided to each type of teams. Thus, we use a nonequivalent dependent variables design to test discriminant validity (Cook and Campbell, 1979). Two hypotheses test discriminant validity:

7. Self-managing teams do not differ from traditionally-managed teams in their perceptions of pay equity.
8. Self-managing teams do not differ from traditionally-managed teams in union recognition of them.

Manz and Sims' quantitative findings represent only the employees' perceptions of their self-managing team leaders' behaviors, whereas the question of how leaders themselves perceive the structural pattern of SMLQ has not yet been explored. Our hypothesis is:

9. The internal structure of the SMLQ is the same for external leaders of self-managing teams as for members of self-managing teams.

As another assessment of construct validity or more specifically nomological validity, we examine the relationships between self-management leadership as measured by the SMLQ and measures of QWL and perceived work group effectiveness. Both of these criterion measures have been widely used in the literature in evaluating the overall practice of self-management. Most of these existing studies have established positive associations between the overall practice of self-management and QWL (Blau & Boal, 1989; Campion, Medsker, & Higgs, 1993; Smith & Brannick, 1990; Strauss, 1963) and subjective measures (Campion, Medsker, & Higgs, 1993; Cordery, Mueller, & Smith, 1991) or objective measures of productivity as reviewed by Beekun (1989), Goodman, Devadas and Hughson (1988), Miller and Monge (1986), and found by Campion, Medsker, & Higgs (1993). Given this positive association between effectiveness and self-management, we expect self-management leadership behaviors that aim at enhancing employee self-control and self-management to show similar relationships with QWL and perceived work group effectiveness. We hypothesize:

10. There is a positive relationship between self-managing leadership behaviors and QWL and perceived work group effectiveness for self-managing work teams.

As discussed earlier, employees from both traditional groups and self-managing work teams are exposed, to some degree, to self-generated as well as organizational controls. Leaders of traditional groups are likely to exhibit some self-managing leadership behaviors, as well as use traditional supervisory control behaviors (Manz and Sims, 1980; 1989). Self-management leadership can best be thought of as a continuum, rather than an "on" versus "off" phenomenon. Thus, we would expect the self-management leadership behaviors used by leaders of traditional groups to be positively associated with QWL and perceived work group effectiveness. Our hypothesis is:

11. There is a positive relationship between self-management leadership behaviors and QWL and perceived work group effectiveness for traditionally-managed teams.

In contrast, we expect no relationship between self-managing leadership behaviors and pay equity for both self-managing and traditionally-managed work teams. There is no obvious reason for

self-managing leadership to have an impact on feelings about the fairness of pay. Finding no relationship helps build the case for discriminant validity. Thus:

12. There is no relationship between self-managing leadership and pay equity for both types of teams.

Method

The Setting

This study was conducted in four geographic regions of a large unionized telephone company. The company had implemented self-managing work teams under the sponsorship of local managers who hoped to improve quality, customer service, and productivity. The teams performed one of the following functions: (1) technical service to internal and external customers (for example, installation and repair teams), (2) small business and residential customer service which involved recommending products and services, inputting customer orders, and resolving customer problems; (3) clerical support to engineers and other technical personnel; and (4) management of engineers and technical personnel.

Research Procedures

To provide guidance for the study, including the identification of the self-managing work teams, the company established a research team that consisted of 10 middle managers from different functional and geographic areas and 4 union representatives. We instructed the research team about self-management concepts, and defined self-managing work teams as interdependent groups organized around a particular customer service or equivalent responsibility that have high levels of employee involvement in decisions such as task assignments and methods for carrying out the work. We further indicated that such groups are responsible for regulating their performance by setting their goals, obtaining performance feedback, making evaluations, and developing necessary corrections.

The research team used this definition of self-managing teams as criteria for subject selection. We had extensive discussions about the concept of self-management, so that research team members had a common understanding and would not select teams simply because they were novel or unusually effective. The study team members identified self-managing work teams from their geographic and

functional areas. When necessary, they also consulted with managers from their home settings to obtain more information about the teams. If a study team member was not sure whether a team should be described as self-managing, he described its characteristics to the study team, and a consensus was reached as to its identification. However, because other study team members did not have direct knowledge of the team in question, they relied on the representative's descriptions for their input.

After the self-managing work teams were identified, the investigators and the task team selected traditionally managed comparison work teams that performed the same type of work. Company task team members distributed questionnaires to employees and supervisors from the teams in the geographic and functional areas they represented. Task team members were not able to inform us how many employees were expected to be in each of the groups. Employees completed the questionnaire during work time, and mailed it back to the researchers using pre-addressed, postage-paid envelopes. Employees and external leaders from these self-managing and traditionally managed teams were comparable on the demographic variables examined.

We also checked the study team's classification of groups by providing employees with our definition of self-managing teams on the questionnaire and asking whether their group fit the definition. When there was a conflict between the study team's classification and the subjective classification by group members, we used the subjective classification. We removed groups from our sample if less than 75% of responding members agreed as to its status of self-managing or not, regardless of the classification by study team members. Ten groups were removed for this reason.

We learned from the research team that the processes used to form self-managing teams varied by function and location. In technical and clerical support functions, higher level managers typically made the determination that self-managing work teams could be beneficial for their area, and the reasons for the transition were frequently idiosyncratic. For example, one supervisor of a repair crew was out on long-term disability after a serious car accident, and his manager took this as an opportunity to form a self-managing team that functioned without a supervisor. In one geographic region of the company, a Senior Vice President of Operations encouraged all his top level managers to have at least

one self-managing work team under their jurisdiction, and this geographic region ended up with 34 self-managing teams in operations, as compared to 12, 4, and 5 in the other regions of the company. In the small business offices, the transition to self-managing teams was part of a state-wide effort that began with pilots in a few offices, and ended with either all the teams in an office being self-managed or being managed conventionally. Although there was considerable variation in how self-managing teams were formed, managers typically involved employees in the decision to become self-managing. Employees in 72% of the self-managing work teams reported that their group volunteered to be self-managing.

When a group became self-managing, the external leader was typically called a coach, facilitator, or leader, although some still were referred to by the managerial level in the company, that is a first-level manager. The first-level managers of traditional groups were typically called supervisors. In this paper, we call self-managing team leaders, "external leaders" and traditionally-managed group leaders, "supervisors".

Sample

The original sample included 1044 employees and 144 external leaders from 81 self-managing and 82 traditionally-managed work teams, out of a target population of 85 self-managing and 84 traditionally-managed groups, a group response rate of 96%. In the present study, we base analyses on a reduced sample of 390 self-managing and 412 traditionally managed employees and 94 external leaders from 58 self-managing and 60 traditionally-managed teams. The reduction is due to an elimination of cases that presented incomplete data in the variables we examine. Using a questionnaire item which asked group members to indicate the number of members in each group, we compared the number of respondents to the reported size of each group. The ratio between the number of respondents in each group to the reported size of the group is .6. The median number of employees in each group was 10. Groups were included in the sample only if there were two or more respondents. Investigation of demographic data--gender, race, education, age, years of employment, and years in the current work unit--indicates that the exclusion of missing data was random except for gender, where slightly but significantly more female subjects were excluded from analyses.

Measures

We obtained data through questionnaires from employees and external leaders. The employee questionnaires measured self-management leadership, QWL, social and growth needs importance, perceived work group effectiveness, pay equity, and union work group recognition. The external leader's questionnaire measured self-management leadership and perceived work group effectiveness. The questionnaire items used a seven point Likert-type response scale, and higher values reflected a higher degree of truth, satisfaction, or effectiveness.

We assessed self-management leadership using Manz and Sims' (1987) self-management leadership questionnaire (SMLQ). Employees and external leaders responded to the same 22 questions, with employees responding about the external leader of their work team and external leaders describing their own behaviors. Key phrases from the SMLQ items are reproduced in Figure 1.

We used QWL measures of job satisfaction (three items, $\alpha = .84$), growth needs satisfaction (four items, $\alpha = .86$), social needs satisfaction (three items, $\alpha = .78$), group satisfaction (three items, $\alpha = .86$), and organizational commitment (five items, $\alpha = .80$). We adapted the first three measures from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). The measure of group satisfaction is from Hackman's (1982) Group Effectiveness Questionnaire. Organizational commitment was a short version of the Mowday and Steers' measure (1979). We adapted measures of social and growth needs importance from the Michigan Organizational Assessment Questionnaire (Cammann et al., 1983). Their alpha coefficients were .79 (three items) and .83 (four items) respectively. We measured perceived work group effectiveness through employee ratings of group performance on quality, productivity, QWL, costs, and safety. Because one factor emerged from principal components analyses, we averaged these five ratings into an employee perceived work group effectiveness score ($\alpha = .87$). We adapted the measure of pay equity from the Michigan Organizational Assessment question (3 items, $\alpha = .91$).

We created a measure of union work group recognition by asking employees whether the union is responsive to their work groups' ideas and suggestions and whether union leaders provide recognition for the work group performing well (2 items, $\alpha = .68$).

We collected external leader ratings of team effectiveness, but did not include them in these analysis because of the lack of sufficient data across external leader and employee samples. We also tried to collect objective performance data from the company. However, the company did not typically track performance at the team level, and where we could collect performance data, it was not comparable across types of teams. Thus, we were not able to obtain objective performance data.

Analyses

We used Pearson product moment correlations to examine the interrelationships among the self-leadership factors for each of the samples. We conducted first and second-order confirmatory factor analyses (CFAs) in the present study using LISREL 7. Since the measurement units were uniform (seven point Likert scales) for all LISREL analyses, we used Pearson product moment correlations as input matrices and standardized coefficients as the output (Joreskog & Sorbom, 1989). We conducted a second-order factor analysis by employing LISREL sub-model 3b, where we specified a Gamma matrix to represent the second-order factor loadings. The goodness of fit measures that we examined in the LISREL analyses included the chi-square test (χ^2), chi-square to degree of freedom ratio (χ^2/df), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean square residuals (rmsr), Bentler and Bonnett's (1980) normed fit index (NFI), James, Mulaik, and Brett's (1982) parsimonious fit index (PFI), and Chi-square difference test ($\Delta\chi^2$). We used the individual level of analysis for these tests. We felt that this was appropriate to test the structure of the SMLQ and did not have the sample size to do these tests at the group level.

We used independent samples t-tests to compare group differences between self-managing and traditionally managed teams in self-leadership and zero order correlations to examine the relationship between self-managing leadership and variables that measured team QWL, perceived effectiveness and

pay equity. As a check for method variance, we divided the respondents on each team into two subsamples and after dropping teams that had fewer than three respondents, we related the predictor variables from one subsample to the criterion measures for the other. These analyses were aggregated to the group level because we were examining differences between types of teams and relationships with team characteristics and outcomes. To compute a team score on each measure, we averaged member responses.

Aggregation should be supported empirically by within-group agreement and interrater reliability, in addition to a theoretical rationale. Campion, Medsker, and Higgs (1993) recommend the use of intraclass correlation or generalizability coefficient of group means as a way to assess interrater agreement. We used ANOVA for computing such agreement estimates, despite the risk of instability because of unequal group sizes in our data. The ANOVA results show that the ratio of within-to-between group variance is statistically significant for 13 out of 14 scales in our study, with the between-group mean square always larger than the within-group mean square. The only exception is social importance, where the ratio was not significant.

There has been a debate in the literature about the appropriate methods for assessing intergroup agreement and intergroup reliability (see James, Demaree and Wolf, 1993, 1984; Kozlowski and Hattrup, 1992; and Schmidt and Hunter, 1989). We chose the approach recommended by Schmidt and Hunter (1989) because we were concerned that the James, Demaree, and Wolf (1984) procedure contradicts the principle of classical test theory. George and Bettenhausen (1990) and Snell & Dean (1994) also used Schmidt and Hunter's procedure in their empirical procedure. However, we also calculated measures of interrater reliability, as suggested by Kozlowki and Hattrup (1992).

Following Schmidt and Hunter's (1989) recommendation, we use standard deviations across raters to assess interrater agreement. We use one standard deviation as a rule of thumb for acceptable interrater agreement. For the majority of the measures in most of the work groups, the within-group standard deviation did not exceed one. The average within-group standard deviations for the leadership,

QWL, effectiveness, and importance measures were .71, .78, .68 and .84 standard deviations for the self-managing work groups and .81, .83, .91 and .92 for the traditionally managed work groups.

To determine interrater reliability, we calculated coefficient alpha by treating the raters on each team as items. We then calculated an average interrater coefficient alpha for each scale across all teams. On average, the coefficient alpha was based on data from 76 teams, because we dropped cases from the analysis when the asumptions of reliability analysis were violated. The average interrater coefficient alpha for the leadership, QWL, effectiveness, and importance measures were .65, .79, .67, .62.

The combined results from the ANOVA, interrater agreement analysis, and interrater reliability analysis support aggregation to the group level.

Results

Hypothesis 1: Same Internal Structure.

The CFA results support the original Manz and Sims' 6-factor model when tested in a sample of 390 self-managing telephone employees. The factor loadings were high, averaging .85, and different goodness-of-fit measures were acceptable, achieving the criteria suggested by Bagozzi and Yi (1988) for GFI and AFGI measures (e.g., >.9). This model also showed superiority when tested against a null model and three alternative models. Results are contained in Table 1. The three alternative models specified one factor, two factors, and seven factors respectively. The 1-factor model was derived from the high intercorrelations among Manz and Sims' six factors. The 2-factor model had the four self-criticism items load on one factor and the rest of the items on another factor. This model was obtained from a principal component analysis on our data by the eigenvalues-greater-than-one rule. Using the same rule, Manz and Sims extracted three factors. Manz and Sims criticized the eigenvalues-greater-than-one rule as being arbitrary and kept the 6-factor solution based on "research sense" (p.126). The 7-factor model was also based on Manz and Sims principal component analysis where "a seventh factor was uninterpretable" (p.115). Manz and Sims discarded this factorial solution for the 6-factor model.

Thus, by using confirmatory factor analysis to test these a priori specified models, we were able to empirically confirm Manz and Sims' model. Thus, their model not only made more “research sense” than the alternative models because it captures the six self-leadership behaviors, but was also empirically superior, because it was the only model that achieved a satisfactory goodness-of-fit. In addition, we conducted a $\chi 2$ difference test as advocated by Anderson and Gerbing (1988). The $\chi 2$ difference test between the one factor model and the six factor model was significant controlling for degrees of freedom, showing that the six factor model was a significant improvement in fit, despite the high intercorrelations among the six factors. The reliabilities of each of the scales in the six factor model are presented in parentheses on the diagonal in Table 2.

Insert Table 1 and Table 2 about here

Hypothesis 2: A General Construct of Encouraging Self-Management Leadership

The intercorrelations among the six employee factor scores were very high as in Manz and Sims' original study (C. C. Manz, personal communication, August 1991). The intercorrelations among the six external leader factor scores were moderate and the intercorrelations between the employee and external leadership samples were relatively low. Table 2 presents intercorrelations and reliabilities for the self-leadership factors for self-managing and traditionally-managed groups for the employee and external leader samples.

We tested a common second-order factor model in the sample of self-managing employees because of the high intercorrelations of the six factor scores in this sample. Table 1 reports the goodness-of-fit measures of this model and Figure 1 shows the measurement model and its factor loadings. The second-order factor model fit the data just as well as the primary 6-factor model. Although the latter had a slightly lower χ^2/df than the former, all the goodness-of-fit indicators as well as the chi-square difference tests were comparable between the two models. The parsimonious fit index (PFI = .93) was better for the second-order model than that of the primary factor model (PFI = .88),

indicating superiority of the former. Since six second-order factor loadings were estimated (instead of the 15 factor intercorrelations estimated in the primary factor model), the second-order factor model was more parsimonious, having 9 more degrees of freedom. By the parsimony criterion in evaluating confirmatory factor analysis (Widaman, 1985), the second-order model was superior.

Insert Figure 1 about here

The second-order factor model also is more explanatory of the data. Letting the factors intercorrelate as specified in the primary-factor model ignores the information represented by this part of the data, since zero order correlation coefficients are confounded by unspecified relationships among the variables involved. Intercorrelations among the six primary factors can be explained by different structural relations. A common second-order factor represents one latent structure that, as indicated by the different fit indices and high factor loadings, fits the data almost as well as the less parsimonious and less explanatory primary factor model.

The successful extraction of a common second-order factor suggests that there may be a broader construct of encouraging self-management that enables the specific self-managing behaviors represented by the primary factors. Before accepting this explanation, we must examine alternative explanations of the findings. First, the common second-order factor may be due to response biases, such as social desirability, that result from using a common survey instrument. Second, the second-order factor may measure the broad construct of organizational climate (James & James, 1989), not the narrower construct of external leader orientation.

Method Effect. First, we consider the possibility that the higher-order factor may be a result of common method variance and lack the substantive meaning that we have attributed to it. To check for this confounding effect, we conducted another second-order CFA involving the 22 SMLQ items and seven additional items measuring two factors of social needs importance and growth needs importance. If there was a generalized response bias such as social desirability, then it would influence these items

as well as the self-managing leadership items. These items were contained in the same questionnaire that included the SMLQ and also were on seven point Likert-type response scales.

We tested two nested second-order factor models, referred to here as the trait model versus the method model. On the primary factor level, parameterizations of the two models were the same--the 22 SMLQ items loaded onto the six SML primary factors and the seven Importance items loaded onto two Importance factors. On the second-order level, in the trait model, the six SML primary factors loaded onto one second-order factor and the two Importance factors loaded onto another second-order factor; and the two second-order factors were correlated. In the alternative method model, the eight primary factors loaded on to one common second-order factor representing common method variance.

These two models were tested, respectively, in self-managing and traditionally managed employee samples. Goodness-of-fit measures indicated the superiority of the trait model (Self-managing sample trait model: χ^2/df = 2.95; GFI = .82; AGFI = .79; rmsr = .04. Method model: χ^2/df = 3.62; GFI = .80; AGFI = .76; rmsr = 0.1. Traditional sample trait model: χ^2/df = 3.35; GFI = .81; AGFI = .78; rmsr = .04. Method model: χ^2/df = 3.83; GFI = .80; AGFI = .76; rmsr = .08.). Chi-square difference tests also indicated that the trait model improved data fitness by reducing the chi-square values greatly at a loss of 1 degree of freedom (Self-managing sample: χ^2 (1) = 248.3, $p < .001$. Traditional sample: χ^2 (1) = 177.4, $p < .001$). Parameter estimates at the primary factor level were adequate with high factor loadings (above .80 for both samples on average) and low errors of estimate (below .10). For the trait model, second-order factor loadings for both trait factors were above .60 for both employee samples with an average correlation between the two trait factors at .12. For the method model, second-order factor loadings linking the six SML primary factors to the common second-order factor were still high, above .70 on average. The second-order factor loadings of the two Importance primary factors were .04 and .14 for the self-managing and .09 and .15 for the traditionally managed sample.

These results showed that the two Importance factors shared little variance with the six SML factors even though items making up both sets of factors were obtained by the same survey method. The results also indicated that the second-order SML factor did not represent method variance alone, and mostly represented true trait variance which the six SML primary factors shared with each other but not with other variables.

Parameter estimates of the SML factors obtained from this 29-item second-order factor analysis were almost identical to those obtained from the second-order CFA involving only the 22 SMLQ items. This estimate stability provides additional evidence supporting the hierarchical factor structure of the SMLQ.

Appraisal Effect. A second possible alternative explanation for the hierarchical factor structure is that the second-order factor represents organizational climate, and thus is not specific to leadership style at all. James and James (1989) defined organizational climate as "general appraisal of the degree that a work environment is personally beneficial versus personally detrimental to the organizational well-being of the individual" (p. 740). To check for this alternative explanation, we conducted a second-order confirmatory factor analysis on the item level using a combined sample of 695 employees from both self-managed and traditionally managed work teams. The 22 leadership items and 18 QWL items were parameterized to load onto six leadership factors and five QWL factors on the primary-factor level. We further specified that the six primary leadership factors loaded onto one second-order factor and the five QWL factors loaded on to another second-order factor. The average primary factor loading was above .80. The average second-order factor loading for both leadership and QWL factors is above .70. The correlation between the two second-order factors is .44. The goodness-of-fit measures from this model are: χ^2/df = 3.8; GFI = .82; AGFI = .79; rmsr = .05. This model is referred to as the "leadership" model below.

We tested the "leadership" model against an alternative model, which can be called an "appraisal" model. In this alternative model, parameterizations on the primary-factor level remained the

same. On the second-order factor level, we estimated one common second-order factor, instead of two distinct factors. The common second-order factor represents what James and James (1989) called an "appraisal" effect. Estimates of primary factor loadings remained the same. On the second-order factor level, the average loading was .65, linking the six leadership primary factors to the common second-order factor, and .35 linking the five QWL primary factors to the common second-order factor. The goodness-of-fit measures were much worse: χ^2/df = 5.9; GFI = .73; AGFI = .69; rmsr = .14. Chi-square difference test comparing the two nested models was strongly in favor of the "leadership" model (χ^2 (1) = 1465, $p < .001$). At the loss of 1 degree of freedom, the "leadership" model improved the goodness-of-fit of the model by a huge chi-square of 1465.

These analyses do not support an alternative explanation that the higher-order self-managing leadership factor is due to a more general substantive explanation such as an appraisal of the benevolence or malevolence of the work environment. These findings also do not support a common method variance argument. However, this does not rule out all possible alternative explanations. There may be other models or explanations that could fit this data.

Hypothesis 3: Same Internal Structure for Traditionally-Managed Employees

We tested the primary factor and second-order factor models in a sample of 412 traditionally managed employees. This analysis answered the question of whether self-management leadership behaviors were perceived in the same way by employees from traditionally managed work teams. Analysis results are also reported in Tables 1 and Figure 1. As the results indicate, there was a high comparability in factor loadings and goodness-of-fit measures among these samples. Again, Manz and Sims' 6-factor model and the second-order factor model showed superiority than the alternatives. Factorial invariance tests between the two employee samples (6-factor: c^2/df = 2.78; GFI = .97, rmrs = .08; second-order factor model: c^2/df = 2.42; GFI = .97, rmrs = .07) further supports the hypothesis that self-management leadership is not structurally different between employees of self-managing and

traditionally managed work teams, because these models achieve satisfactory goodness-of-fit and achieve the fit criteria recommended by Bagozzi and Yi (1988).

Hypothesis 4: Self-Managing Teams View External Leaders as More Encouraging of Self-Managing Behaviors

We conducted independent samples t-tests to compare the group differences between the self-managing and traditionally managed employees in their evaluations of self-management leadership behaviors. This analysis was done at the group level. As reported in Table 3, employees of self-managing work teams rated their external leaders higher than did employees of traditionally managed teams on two primary factors at the .01 level, encouraging self-goal-setting and encouraging self-criticism, and on the one second-order factor at the .05 level. Means for all six factors (in absolute value) were higher for the self-managing work teams. A Wilcoxon signed test of these six mean differences was significant, $z = 2.20$, $p<.05$. Although the self-managing teams are rated higher, the differences are relatively small.

Insert Table 3 About Here

Hypothesis 5: Self-Managing Team Leaders View Themselves as More Encouraging of Self-Managing Behaviors

We also conducted independent samples t-tests of external leaders of self-managing versus supervisors of traditionally managed teams. For the external leader t-tests, only encouraging self-goal setting was statistically significant at the .05 level. Means for external leaders of self-managing work teams were higher in absolute value on all the SMLQ factors. A Wilcoxon signed test of these six mean differences was significant, $z = 2.20$ $p < .05$. Although means for external leaders of self-managing work teams were rated higher, the differences are small.

Hypothesis 6: Higher Quality of Work Life and Group Effectiveness Outcomes for Self-Managing Teams

We also conducted independent samples t-tests to compare the group differences between self-managing and traditionally managed groups on QWL and work group effectiveness outcomes. As shown in Table 3, self-managing teams were higher than traditionally managed teams on growth and social satisfaction at the .01 level, and on organizational commitment at the .05 level. All five QWL values were higher in absolute values for the self-managing work teams. A Wilcoxon signed test showed that these differences were significant, $z = -2.02$, $p<0.05$. Self-managing teams also rated their work team effectiveness as higher than did traditionally managed teams ($t= 4.70$, $p<.001$). The difference in work team effectiveness between both types of teams was moderate and worthy of attention, although some of the QWL differences were relatively small.

Hypothesis 7: No Difference in Pay Equity

We also conducted independent samples t-tests to compare the group differences in perceptions of pay equity between self-managing and traditionally-managed groups. As shown in Table 3, there was no difference in perceptions of pay equity between types of teams.

Hypothesis 8: No Difference in Union Work Group Recognition

Independent sample t-tests of the hypothesis that there was no difference in union work group recognition between types of teams showed no difference (see Table 3).

Hypothesis 9: Same Internal Structure for External Leaders

These models were also tested in a sample of 120 external leaders, answering the question of whether leaders viewed their self-managing leadership behaviors in the same way as employees. To a lesser degree of fit, factorial invariance between employees and supervisors was sustained (6-factor: $c^2/df = 3.2$; GFI = .81, rmrs = .20; second-order factor model: $c^2/df = 3.0$; GFI = .82, rmrs = .20). As shown in Figure 1, factor loadings were lower for the supervisor analysis than those estimated in the employee samples. This was true for all the models tested. Apparently, the SMLQ needs to be modified to better fit the supervisor population.

Hypotheses 10 and 11: Effectiveness of Self-Managing Leadership For Self-Managing Work Teams and Traditionally-Managed Groups

We computed zero-order correlations between the six self-management leadership factors and perceived work group effectiveness and five measures of QWL for self-managing, traditionally managed, and a combined sample in which the respondents on each team were divided into two subsamples, and predictor variables from one subsample were related to criterion measures from the other. The reason for relating predictor data from one subsample of respondents in the team with criterion data from another subsample of respondents in the team is to avoid the common method variance problems such as priming, consistency, and self-generated validity that occur when all the data come from the same respondents (Campion, 1988). These analyses were done at the aggregated group level. Table 4 presents the correlation matrices. Overall, the correlations were positive but moderate, revealing a positive relationship between self-managing leadership and both QWL and perceived work group effectiveness for self-managing teams, traditionally-managed groups and the sub-divided group sample. The cross-sample correlations from the sub-divided groups may be a bit depressed due to slightly lower reliabilities because they are based on half the number of respondents.

Although there were more significant relationships between predictors and outcomes for the self-managing teams as compared to the traditional groups (28 versus 17), the vast majority of the correlation differences between types of teams were not significant. Using Fisher's z-transformation, we conducted z-tests of differences between self-managing and traditionally managed employee teams. Out of 30 comparisons, only one was significant, the relationship between self-goal-setting and group satisfaction was higher for self-managing work teams ($p < .05$, one-tailed).

Insert Table 4 about here

Encouraging self-criticism was associated with social satisfaction in self-managing teams and with group and growth satisfaction for the sub-divided combined sample, but not with any other outcome for either self-managing or traditionally managed groups or the sub-divided combined sample.

In general, these correlations suggest that the self-managing leadership behaviors were moderately but positively related to QWL and work group effectiveness, whether or not a team is self-managing. Both types of teams are similar in their relationships between predictors and outcomes.

Hypothesis 12: Relationship Between Self-Managing Leadership and Pay Equity

As shown in Table 4, there is no relationship between self-managing leadership and pay equity except for encouraging self-criticism which is negatively associated with pay equity in self-managing work teams and positively associated in traditional groups. This correlation difference between self-managing work teams and traditional groups is statistically significant. For the divided sample, there are no relationships between self-managing leadership and pay equity.

Discussion

This study offers theoretical and empirical extensions of the study of self-management leadership by Manz and Sims (1987). We replicated the original study in a different organization. We identified a higher order factor consistent with a hypothesized general leadership orientation toward encouraging employee self-management. We also examined construct validity in a number of ways.

Replication of Manz and Sims (1987) Factor Structure

We replicated the Manz and Sims (1987) study in a telephone company, which is a setting quite different from the manufacturing plants of the original study. CFA results in our study supported the Manz and Sims (1987) model of six self-management leadership factors. This model better fit the data than the null model and three alternate models. Our approach parallels work by Bollen and Hoyle (1990) on perceived cohesion. Based on theory and CFA results, they argue that there are distinct conceptual dimensions of perceived cohesion, even though the dimensions are highly correlated.

The Hierarchical Concept of Self-Management Leadership

We investigated the hypothesis that the factor structure of the SMLQ would include a higher order factor in addition to the six primary self-management leadership factors found by Manz and Sims (1987). The social learning theory perspective on which Manz and Sims base the SMLQ suggests that the essence of self-management leadership lies in developing employee self-efficacy so that employees

have the confidence and competence to manage themselves. This suggests that self-management leadership is a hierarchical concept, constituted of specific strategies as well as a general orientation toward empowering employees.

We found that a common second order model fit the data better than a six factor model. We found this to be the case for the self-managing employee sample (H2), the traditionally managed sample (H3), and to a lower degree of fit, the supervisory sample (H7). The second order factor helps explain the high correlations among the six basic factors present in this study as well as in the original Manz and Sims (1987) study.

We examined two rival explanations for the high intercorrelations among the six basic SMLQ factors. We investigated a response bias explanation (for example, social desirability) and the possibility that a broader, higher order construct (namely, organizational climate) might explain our findings. CFA tests, using variables that were not part of the SMLQ measures, indicated that the second order model better fit the data than either alternative. However, the superiority of the second order model was not great in the response bias analysis.

An alternative test of these rival explanations would have involved measuring social desirability and organizational climate in the surveys, and correlation of these measures with the second order factor. Although this approach would have been more direct, we did not include measures of these constructs in our study.

We cannot rule out other alternative explanations to the hierarchical model. Our interpretation of the higher order factor is narrow, and is consistent with self-managing leadership and learning theory. Hypotheses could be derived from cognitive theories, motivational theories, or others to explain the finding of a hierarchical factor structure. One possibility arises from the use of the terms “encourage,” “prompt”, “urge,” or “help,” in all the SMLQ items. Perhaps the SMLQ is measuring an encouraging leadership style, not self-management leadership. These can be investigated in future studies.

The study did not try to elicit a broad set of leadership behaviors from traditional and self-managing teams so that a rigorous comparison between self-management and traditional leadership

behaviors would be possible. Future studies should analyze other leadership behaviors and functions together with self-management leadership behaviors to assess convergent and discriminant validities. For example, Pearce et al. (1995) examined a variety of leadership behaviors in addition to self-management leadership.

Assessing Self-Management Leadership Theory: Examining Construct Validity of the SMLQ

We assessed self-management leadership theory by examining construct validity of the SMLQ in a variety of ways. We found that self-managing teams rated their external leaders as encouraging more self-management leadership behaviors than leaders of traditionally managed groups, although the differences were relatively small (H4). We found weak support for the hypothesis (H5) that leaders of self-managing teams perceive themselves as encouraging more self-management behaviors than supervisors of traditionally managed groups. Self-managing teams reported higher self ratings of QWL and perceived team effectiveness than traditionally managed groups, and the differences in work team effectiveness were moderate and noteworthy (H6). Two discriminant validity tests found that, as predicted, self-managing teams did not differ from traditionally managed groups in perceptions of pay equity (H7) or union recognition of the work group (H8).

These results are generally supportive of self-management leadership theory. They indicate that the SMLQ is a valid measure of self-management leadership behaviors that are related to important outcomes. These findings extend the Manz and Sims (1987) study, which examined only the outcome of perceived leadership effectiveness. Our study improves on the original Manz and Sims study by using data from self-managing as well as traditional groups, external leaders of both types of groups as well as group members, and data about multiple outcomes.

There are several weaknesses in our study. All of our outcome measures are drawn from the same questionnaire instrument that measured the SMLQ behaviors. The finding of discriminant validity provides some reassurance that the results are not due entirely to a methodological artifact. However, pay equity and union recognition are relatively weak comparison variables, and future studies should attempt to have better comparison variables such as other types of leadership behaviors. In addition, hard

performance outcomes would be superior as measures of team performance. These were unavailable because the widely varying teams in our sample had no common performance metrics. We also attempted to collect supervisor ratings of team effectiveness, but could not obtain sufficient data across supervisory and employee samples. Future studies should employ multiple criteria of effectiveness from different data sources, if possible using objective performance data.

The relatively weak support for Hypothesis 5 that self-managing team leaders view themselves as more encouraging of self-managing behaviors requires further comment. First, the SMLQ may fit the employee population for which it was designed better than the supervisor population. This suggests the possible need to develop a parallel instrument for external leaders. Inspection of the results reported in Table 3 suggests two other possibilities. Supervisor responses are higher on every measure than employee responses, and all of these differences are significant. A social desirability bias may inflate scores of traditional supervisors, since contemporary management ideology emphasizes "empowerment" and other ideas that are highly consistent with employee self-regulation. Finally, external leaders of both self-managing and traditional groups may actually display self-managing leadership behaviors, since leaders may find through experience that encouraging employee self-regulation is more effective than relying solely on organizational controls.

Effectiveness of Self-Management Leadership

We performed a correlation analysis in which the respondents on each team were divided into two subsamples, with one subsample predicting the criterion measures of the other group. Self-managing leadership behaviors were related to QWL and perceived work group effectiveness in both self-managing teams and traditional work groups. A discriminant validity test found that there was no relationship between self-managing leadership behaviors other than encouraging self-criticism and pay satisfaction. The use of a split sample and the predicted discrimination between outcomes relevant and irrelevant to self-managing leadership greatly reduces our concerns about same source method bias.

These findings are consistent with prior theory and research indicating that employee experience greater satisfaction with their work and may perform better when supervisors encourage self

direction, irrespective of whether employees are in self-managing teams. Studies of cognitive evaluation theory (Deci, 1975) and job design theory (Hackman & Oldham, 1975) have found that having authority to exercise discretion over one's work builds internal work motivation and satisfaction, and can contribute to effectiveness. The team effectiveness finding is consistent with results from several studies reporting a positive but modest improvement in performance from the adoption of self-managing teams (for example, Goodman et al., 1988). Thus, supervisors of work teams apparently can contribute to higher employee QWL and improved team effectiveness by encouraging self-management.

There are some interesting implications of the findings concerning external leadership of traditionally managed groups. Members of these groups and the leaders themselves do not report the absence of self-managing leadership on the part of such supervisors. Rather, the average amount that traditional groups' members report was merely somewhat less than for members of self-managing teams. This finding supports the concept that self-managing leadership is not an "on" versus "off" phenomena, but is more of a continuum. The analyses suggest that displaying self-managing leadership behaviors is associated with positive results for both self-managing teams and traditional work groups. This finding is consistent with a recent study by Campion, Papper, and Medsker (1996), in which they found that the degree of "single team identity" did not moderate relationships with effectiveness. In their study, they also found a positive relationship between team characteristics and effectiveness, even if the team was not highly team-like or self-managed.

These results suggest the possibility that management development efforts might profit by encouraging leaders of all types of teams to display self-managing leadership behaviors. Moreover, the results suggest that training these behaviors may be a matter of recognizing, reinforcing, and increasing the use of behaviors that are within the supervisor's repertoire. This probably is a more palatable approach than demanding a total reorientation of management values that is often called for in leading self-managing groups (for example, Ketchum & Trist, 1992; Manz, Keating, & Donnellon, 1990; Walton & Hackman, 1986). Since supervisors in all types of organizations increasingly are being asked to encourage self-management, supervisor training is an important issue (Kerr, Hill, & Broeding, 1986).

A weakness of these findings is that the relationship between self-managing leadership and outcomes is only moderate. Why were the correlations not stronger? The self-managing leadership behaviors examined in this study represented one leadership dimension. Other leadership functions including managing material resources and boundary spanning. A more comprehensive model of self-management leadership may better explain variations in work team effectiveness. For example, Cummings (1978) emphasizes that supervisors of teams need to managing the external boundaries of the organization as well as facilitate internal group development. Manz and Sims address the latter. Similarly, Susman (1976) argues that supervisors of self-managing groups must be responsible for managing both the technical and social systems. Manz and Sims focus on the social system.

The direction of causality cannot be determined from correlations. Self-managing leadership behaviors may contribute to employee QWL and team effectiveness. An alternative is suggested by attribution theory. Effective teams with highly satisfied employees may make the attribution that their supervisors encourage self-management. Another possibility is that satisfied employees from effective teams may encourage their supervisors to display self-managing leadership behaviors. There may also be more complex causal patterns involving positive feedback loops, such that employee and supervisory self-management behaviors are suggested by attribution theory. Effective teams with highly satisfied employees may make the attribution that their supervisors encourage self-management. Another possibility is that satisfied employees from effective teams may encourage their supervisors to display self-managing leadership behaviors. There may also be more complex causal patterns involving positive feedback loops, such that employee and supervisory self-management behaviors are mutually reinforcing.

Of the six SMLQ factors, “encourage self-criticism” has the weakest association with the criterion variables. It is not significantly related to the criterion variables at a group level of analysis. This is similar to the finding in Manz and Sims’ (1987) study. They suggest that encouraging self-criticism may be problematic because it focuses on what employees should not do rather than what they should do, and it is difficult to apply consistently.

Conclusion

The study provides evidence that self-managing leadership is a valid theoretical construct as assessed by the SMLQ, a research instrument developed by Manz and Sims. Our analyses indicate that these behaviors by external leaders are found more often in self-managing than traditional teams and are positively related to QWL and effectiveness for both self-managing teams and traditional work groups. Self-managing work teams are more effective than traditionally managed groups. Moreover, our analysis identifies a second-order factor that is consistent with a general orientation toward self-managing leadership and the hierarchical factor structure is invariant across self-managing and traditionally managed work teams.

References

Anderson, J.C. & Gerbing. D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103: (3), 411-423.

Bandura, A. (1977). Social learning theory. Englewood Cliffs, NJ: Prentice-Hall.

Bagozzi, R.P. & Yi, Y. (1988). On the evaluation of structural equation models. Academy of Marketing Science, 16(1), 74-94.

Beekun, R. I. (1989). Assessing the effectiveness of sociotechnical interventions: Antidote or fad? Human Relations, 47, 877-897.

Bentler, P. M., & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin, 88, 588-606.

Blau, G., & Boal, K. (1989). Using job involvement and organizational commitment interactively to predict turnover. Journal of Management, 15 (1), 115-127.

Bollen, K.A., & Hoyle, R.H. (1990). Perceived cohesion: A conceptual and empirical examination. Social Forces, 69 (2), 479-504.

Cammann, C., Fichman, M., Jenkins, D. G. Jr., & Klesh, J. R. (1983) Assessing the attitudes and perceptions of organizational members. In S. E. Seashore, E. E. Lawler III, P. H. Mirvis, & C. Cammann (Eds.), Assessing organizational change (pp. 71-138). New York: Wiley-Interscience.

Campion, M.A., Papper, E.M., & Medsker. (1996). Relations between work team characteristics and effectiveness: A replication and extension. Personnel Psychology, 49, 429-452.

Campion, M. A., Medsker, G. J., & Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. Personnel Psychology, 46, 823-850.

Cattell, R. B. (1973). Factor analysis: An introduction and manual for psychologist and social scientist. Westport, CT: Greenwood Press.

Cohen, S.G. (1994). Designing effective self-managing work teams. In M. Beyerlein (Ed.), Advances in the interdisciplinary studies of work teams: Series on self-managing work teams: Vol. 1. Greenwich, Connecticut: JAI Press.

Cohen, S. G., & Ledford, G. E., Jr. (1994). The effectiveness of self-managing teams: A quasi-experiment. Human Relations.

Cook, T.C., & Campbell, D.T. (1979). Quasi-experimentation: Design and analysis issues for field settings. Boston: Houghton Mifflin Company.

Cordery, J. L., Mueller, W. S., & Smith, L. M. (1991). Attitudinal and behavioral effects of autonomous group working: A longitudinal field study. Academy of Management Journal, 34, 464-476.

Cummings, T. (1978). Self-regulating work groups: A sociotechnical synthesis. Academy of Management Review, 3, 625-634.

Deci, E. L. (1975). Intrinsic motivation. New York: Plenum.

George, J.M. & Bettenhausen, K. (1990). Understanding prosocial behavior, sales performance, and turnover: A group-level analysis in a service context. Journal of Applied Psychology, 75(6), 698-709.

Goodman, P. S., Devadas, R., & Hughson, T. L. (1988). Groups and productivity: Analyzing the effectiveness of self-managing teams. In J. P. Campbell, R. J.Campbell, and Associates (Eds.), Productivity in organizations (pp. 295-325). San Francisco: Jossey-Bass.

Gorsuch, R.L. (1983). Factor analysis (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Hackman, J. R. (Ed.). (1982). A set of methodologies for research on task performing groups. (Monograph). New Haven: Yale University.

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. Journal of Applied Psychology, 60, 159-170.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. Journal of Applied Psychology, 69(1), 85-98.

James, L.R., Demaree, R.G., & Wolf, G. (1993). R_{wg}: An assessment of within-group interrater agreement. Journal of Applied Psychology, 78(2), 306-309.

James, L. A. & James, L. R. (1989). Integrating work environment perceptions: Explorations into the measurement of meaning. Journal of Applied Psychology, 74, 739-751.

James, L. R., Mulaik, S. S., & Brett, J. M. (1982). Causal analysis. Beverly Hills, CA: Sage.

Joreskog, K. G., & Sorbom, D. (1989). LISREL 7. Chicago: SPSS Inc.

Kerr, S., Hill, K. D., & Broeding, L. (1986). The first line external leader: Phasing out or here to stay? Academy of Management Review, 11(1), 103-117.

Ketchum, L. D., & Trist, E. (1992). All teams are not created equal: How employee empowerment really works. Newberry Park, CA: Sage.

Kozlowski, S.W. & Hattrup, K. (1992). A disagreement about within-group agreement: Disentangling issues of consistency versus consensus. Journal of Applied Psychology, 77(2), 161-167.

Lawler, E. E. III. (1986). High involvement management. San Francisco: Jossey-Bass.

Lawler, E.E. III, Mohrman, S.A., & Ledford, G.E., Jr. (1995). Creating high performance organizations: Practices and results of employee involvement and TQM in Fortune 1000 Companies. San Francisco: Jossey Bass.

Lawler, E.E. III, & Rhode, J.G. (1976). Information and control in organizations. Santa Monica, CA: Goodyear.

Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance. Psychological Bulletin, 90, 125-152.

Mahoney, M. J., & Arnkoff, D. B. (1978) Cognitive and self-control therapies. In S. L. Garfield & A. E. Gorgin (Eds), Handbook of psychotherapy and therapy change. New York: Wiley.

Manz, C. C. (1986). Self-leadership: Toward an expanded theory of self-influence processes in organizations. Academy of Management Review, 11, 585-600.

Manz, C. C., Keating, D. E., & Donnellon, A. (1990, Autumn). Preparing for an organizational change to employee self-management: The managerial transition. Organizational Dynamics, 15-26.

Manz, C. C., & Sims, H. P. (1980). Self-management as a substitute for leadership: A social learning theory perspective. Academy of Management Review, 5, 361-367.

Manz, C. C., & Sims, H. P. Jr. (1982). The potential for groupthink in autonomous work groups. Human Relations, 35, 773-784.

Manz, C. C., & Sims, H. P. Jr. (1984). Searching for the "unleader": Organizational member views on leading self-managed groups. Human Relations, 37, 409-424.

Manz, C. C., & Sims, H. P. Jr. (1986). Leading self-managed groups: A conceptual analysis of a paradox. Economic and Industrial Democracy, 7, 141-165.

Manz, C. C., & Sims, H. P. (1987). Leading workers to lead themselves: The external leadership of self-managed working teams. Administrative Science Quarterly, 32, 106-128.

Manz, C. C., & Sims, H. P. (1989) Superleadership: Leading others to lead themselves. New York: Prentice-Hall.

Miller, K. I., & Monge, P. R. (1986). Participation, satisfaction, and productivity: A meta-analytic review. Academy of Management Journal, 29, 727-753.

Mills, P. K. (1983). Self-management: Its control and relationship to other organizational properties. Academy of Management Review, 8, 445-453.

Mowday, R. & Steers, R. M. (1979). The measurement of organizational commitment. Journal of Vocational Behavior, 14, 224-247.

Pearce, C.L, Sims, H.P. Jr., Cox, J., Scully, J. Ball, G., Olian, J., Schnell, E., Smith, K.A., Smith, K.G., & Trevino, L. (1995). A multi-study second-order factor analytic approach to theory building: The dimensions of leadership archetypes. Unpublished manuscript. University of Maryland at College Park, The Maryland Center for Quality and Productivity.

Schmidt, F. L. & Hunter, J. E. (1989). Interrater reliability coefficients cannot be computed when only one stimulus is rated. Journal of Applied Psychology, 74(2), 368-370.

Sims, H. P., & Manz, C. C. (1982). Conversations with self-managed work groups. National Productivity Review, 3 (Summer), 261-269.

Snell, S.A. & Dean, J.W. (1994). Strategic compensation for integrated manufacturing: the moderating effects of jobs and organizational inertia. Academy of Management Journal, 37(5), 1109-1140.

Smith, C. S., & Brannick, M. T. (1990). A role expectancy model of participative decision-making: A replication and theoretical extension. Journal of Organizational Behavior, 11, 91-104.

Strauss, G. (1963). Some notes on power-equalization. In H. J. Leavitt (Ed.), The social science of organizations (pp. 39-84). Englewood Cliffs, NJ: Prentice-Hall.

Susman, G. I. (1976). Autonomy at work: A socio-technical analysis of participative management. New York: Praeger.

Walton, R. E., & Hackman, J. R. (1986). Groups under contrasting management strategies. In P.S. Goodman (Ed.), Designing effective work groups. San Francisco: Jossey-Bass.

Wellins, R., & Byham, W. C. (1991). Empowered teams. San Francisco: Jossey-Bass.

Widaman, K. F. (1985). Hierarchically nested covariance structure models for multitrait-multimethod data. Applied Psychological Measurement, 9, 1-26.

Table 1

Confirmatory Factor Analysis Results

Model/Sample	X^2	GFI	AGFI	rmsr	NFI	PFI
Null, df = 210						
Self-managed employee	15582	.21	.05	.60	--	--
Traditionally managed employee	17031	.21	.05	.60	--	--
External Leader	2541	.38	.25	.40	--	--
1-Factor, df = 209						
Self-managed employee	2110.9	.61	.53	.09	.86	.85
Traditionally managed employee	2278.1	.59	.51	.08	.86	.85
External Leader	857.7	.55	.46	.14	.65	.63
2-Factor, df = 208						
Self-managed employee	1944.8	.62	.54	.09	.87	.86
Traditionally managed employee	2121.6	.61	.52	.09	.87	.86
External Leader	753.0	.60	.51	.13	.70	.69
6-Factor, df = 194						
Self-managed employee	514.1	.97	.96	.07	.96	.88
Traditionally managed employee	554.8	.97	.96	.08	.97	.89
External Leader	259.9	.92	.90	.09	.90	.83
7-Factor, df = 188						
Self-managed employee	962.6	.80	.73	.05	.93	.83
Traditionally managed employee	1099.8	.79	.72	.05	.92	.82
External Leader	490.7	.74	.65	.10	.78	.69
Second-order, df = 203						
Self-managed employee	607.0	.97	.96	.07	.96	.93
Traditionally managed employee	651.6	.97	.96	.09	.96	.93
External Leader	294.4	.92	.90	.09	.88	.85

Note 1: Self-managed employee n = 390, traditionally managed employee n = 412, and external leader n = 120.

Note 2: All chi-square values are significant, $p < .001$.

Note 3: df = degrees of freedom; X^2/df = chi-square to degree-of-freedom ratio; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; rmsr = root mean squares residual; NFI = normed fit index; PFI = parsimonious fit index.

Note 4: Chi-square differences tests between the 6 factor models and the one factor models are each significant. (SMT X^2d=1596.8,df = 15,.p <.001; TMT X^2d = 1723.3, df =15, p<.001; external leader X^2d = 615.8, df = 15, p< .001. These results indicate that the 6 factor model provides a better fit than the 1 factor model.

Table 2

Intercorrelations of Self-Managing Leadership Factors for the Combined Sample and for Self-Managing Teams and Traditionally-Managed Groups at the Group Level [a]

	Measure	1	2	3	4	5	6	7	8	9	10	11	12
Employee Data													
1.	Encourage rehearsal	(.92) [b]											
2.	Encourage self-goal setting [c]	.73*** .72*** .77***	(.93)										
3.	Encourage self-criticism	.56*** .60*** .54***	.59*** .60*** .53***	(.91)									
4.	Encourage self-reinforcement	.79*** .79*** .79***	.85*** .83*** .89***	.43*** .48*** .35**	(.94)								
5.	Encourage self-expectation	.79*** .79*** .79***	.86*** .84*** .90***	.60*** .65*** .54***	.87*** .86*** .88***	(.87)							
6.	Encourage self-observation	.78*** .81*** .76***	.85*** .86*** .85***	.65*** .64*** .65***	.82*** .81*** .83***	.89*** .91*** .88***	(.91)						

Table 2 (continued)

Intercorrelations of Self-Managing Leadership Factors at the Group Level

	Measure	1	2	3	4	5	6	7	8	9	10	11	12
External Leader Data													
7.	Encourage rehearsal	.33**	.22*	.03	.22*	.28**	.18	(.73)					
		.34*	.34*	-.02	.35*	.41**	.34*						
		.34**	.22	.07	.18	.23	.14						
8.	Encourage self-goal-setting	.19*	.45***	-.03	.40***	.33**	.29**	.41***	(.85)				
		.03	.38**	-.18	.25	.20	.13	.36**					
		.27*	.44**	-.02	.44**	.37**	.32*	.45***					
9.	Encourage self-criticism	-.04	-.06	-.09	-.14	-.07	-.06	.02	.15	(.88)			
		.09	.01	-.06	.00	.19	.13	.27*	.39*				
		-.15	-.18	-.16	-.27*	-.27*	-.23	-.04	-.04				
10.	Encourage self-reinforcement	.24*	.34***	-.01	.39***	.33*	.26**	.49***	.64***	.14	(.79)		
		.23	.44*	.06	.41**	.41**	.32*	.60***	.66***	.34**			
		.24	.32*	-.11	.41**	.28*	.23	.42***	.63***	-.04			
11.	Encourage self-expectation	.08	.20*	-.01	.17	.22*	.12	.39***	.48***	.30**	.56***	(.72)	
		.04	.26	-.06	.22	.24	.13	.43**	.69***	.44**	.58**		
		.12	.16	.03	.12	.20	.11	.39**	.28*	.17	.54***		
12.	Encourage self-observation	.23*	.22*	.06	.19*	.29**	.21*	.55***	.48***	.27***	.63***	.70***	(.72)
		.25	.44**	.05	.33*	.46**	.42**	.55***	.69***	.49***	.70***	.74***	
		.22	.09	.07	.09	.14	.05	.57***	.32**	.10	.57***	.65***	

[a] N= 118 for values using employee data, 58 for values using self-managing teams (SM) and 60 for traditionally managed groups (TM); N= 94 for values using external leader data, 42 SM and 52 TM; N= 75 for values across data sets, 34 SM and 41 TM.

[b] The alpha coefficients of reliabilities for each of the self-leadership factors are displayed in parentheses on the diagonal.

[c] Values on the first line are for the entire sample; values on the second line are for the SM sample; values on the third line are for the TM sample.

* p<.05, one-tailed test.

**p<.01, one-tailed test.

***p<.001, one tailed test.

Table 3

T-Tests of Mean Differences Between Self-Managed (SM) and Traditionally Managed (TM) Teams

	Employees			External Leaders		
Variables	SM[a]	TM[b]	T-Value	SM[c]	TM[d]	T-Value
SMLQ factor						
Encourage rehearsal	4.21	4.13	.48	5.41	5.40	.01
Encourage self-goal-setting	4.83	4.25	3.04**	5.56	5.16	1.86*
Encourage self-criticism	4.33	3.90	2.76**	5.03	4.79	1.01
Encourage self-reinforcement	4.54	4.33	1.05	5.90	5.83	.43
Encourage self-expectation	4.86	4.70	.94	5.96	5.85	.81
Encourage self-observation	4.81	4.59	1.24	5.93	5.84	.69
Second order factor	4.60	4.31	1.77*	5.63	5.48	1.26
Quality of Work Life						
Organization Commitment	4.51	4.32	2.04*			
Group Satisfaction	4.56	4.49	1.01			
Growth Satisfaction	4.84	4.37	3.01**			
Social Satisfaction	5.34	5.02	2.78**			
Job Satisfaction	4.42	4.38	.53			
Work Group Effectiveness	5.50	5.04	4.70***			
Pay Equity	4.36	4.13	1.11			
Union Work Group Recognition	3.01	2.97	.35			

[a] N=58.
[b] N=60.
[c] N=42.
[d] N=52.
*p<.05, one-tailed test.
**p<.01, one-tailed test.
***p<.001, one-tailed test.

Table 4

Correlations between Self-Management Leadership and Outcomes at the Group Level for Self-Managing Teams, Traditionally Managed Groups, and Sub-Divided Group Sample [a] [b]

Outcomes	Rehearsal	Self-goal setting	Self-criticism	Self-reinforcement	Self-expectation	Self-observation
Organizational commitment	.21*	.23*	.03	.24*	.21	.16
	.45***	.41***	.19	.39***	.33**	.27*
	.20*	.25**	-.00	.23**	.18*	.17*
Group satisfaction	.38**	.39***	.17	.31**	.26**	.29**
	.12	.09	.01	.08	.08	.11
	.28**	.30***	.19*	.26**	.26**	.13
Growth satisfaction	.26*	.30**	.15	.23**	.25*	.28*
	.38**	.26*	.02	.31**	.24*	.15
	.28**	.30***	.16*	.29***	.22**	.13
Social satisfaction	.36**	.38**	.25*	.32**	.35**	.42***
	.46***	.21*	.01	.30**	.24*	.19
	.28**	.19*	.13	.23**	.19*	.12
Job satisfaction	.34**	.30**	.13	.30**	.21	.25*
	.30**	.17	.10	.20	.13	.15
	.21*	.17*	.15	.14	.16*	.16*
Group effectiveness	.35**	.30**	.12	.27*	.31**	.26*
	.30**	.40***	.05	.41***	.37**	.31**
	.06	.20*	.15	.18*	.17*	.13
Pay equity	-.11	-.11	-.33*	-.11	-.18	-.17
	.05	-.03	.30*	-.17	-.09	.02
	.02	.03	-.02	-.12	-.14	-.01

[a] Values on the first line are for self-managing teams (SM); values on the second line are for traditionally-managed groups (TM); values on the third line are for the sample that divides each team into two subgroups and then relates to predictor variables from one subgroup to the criterion measures for the other.

[b] N=58 SM; N=60 TM; N=106 for the sub-divided group sample.

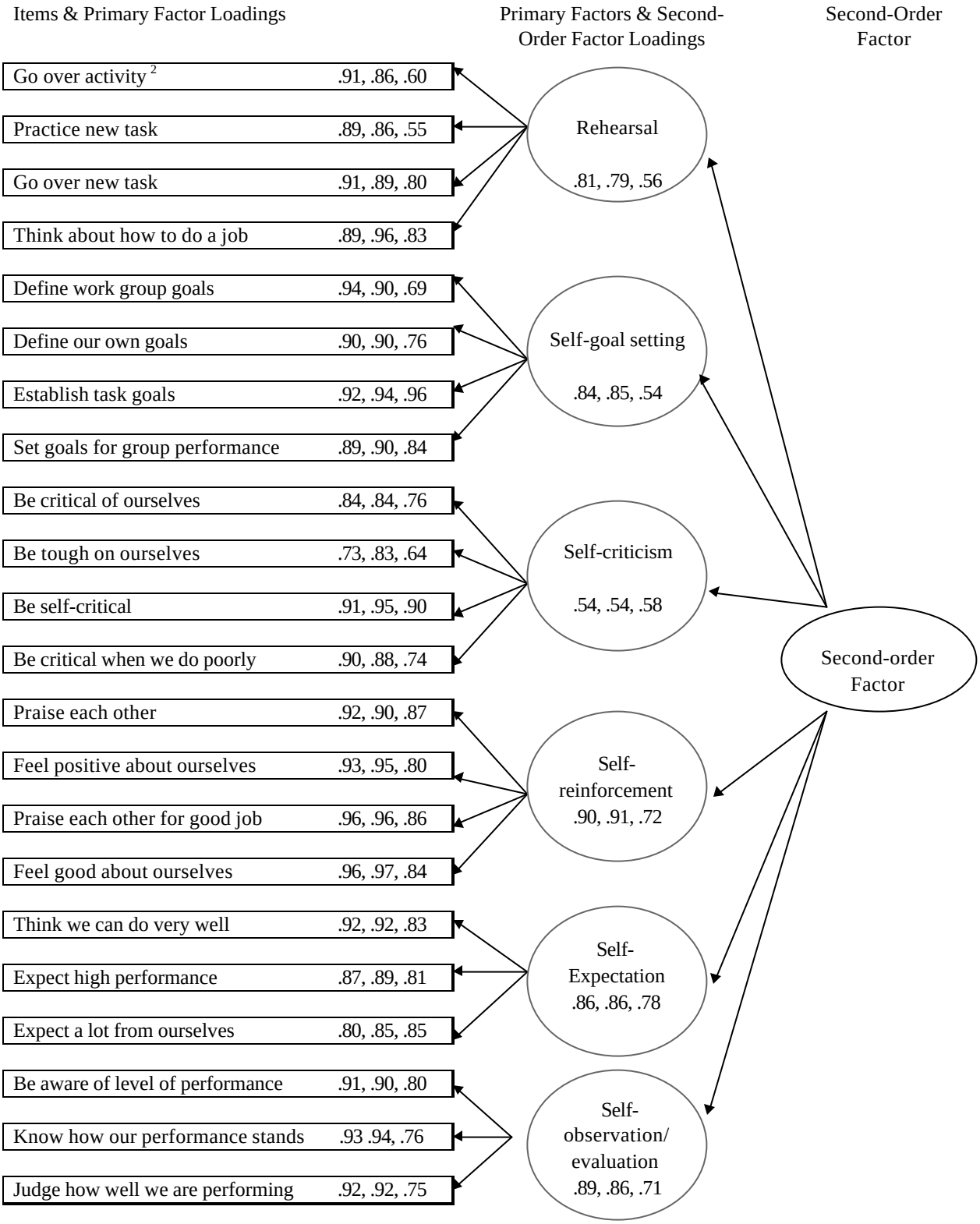
*p<.05

**p<.01

***p<.001

Figure 1

SMLQ Measurement Model and Factor Loadings from Self-Managing Employees, Traditionally-Managed, and External Leaders [1]



[1] Self-Managing Employees (n=390) are the first of each set of three values, traditionally-managed employees (n=412) are the second, and external leaders (n=230) are the third.

[2] Most of the items begin with "Our leader encourages us to…"