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The Role of Individual Differences in Employee Adoption of TQM Orientation

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Abstract

While Total Quality Management (TQM) has emphasized organizational-level factors in achieving successful implementation, human capital theory and person-environmental fit models suggest individual difference factors may also be useful. Accordingly, the ability of organizational commitment, trust in colleagues, and higher order need strength to explain variation in TQM adoption, after inclusion of organizational level factors, is assessed using longitudinal data from a manufacturing setting. These three individual differences collectively explain 7% to19% of incremental variation in TQM adoption and are found to be relatively better predictors of TQM adoption than organizational level factors. The findings support increased consideration of individual differences in order to implement TQM and other forms of organizational change more effectively.

The Role of Individual Differences in Employee Adoption of TQM Orientation

In spite of the phenomenal adoption of total quality management (TQM) in the last two decades among U.S and UK organizations (Mohrman, Tenkasi, Lawler & Ledford, 1995; Wilkinson, Snape & Allen, 1993), the evidence of its impact on organizational performance is mixed (Choi & Behling, 1997; Fisher, 1992; Gilbert, 1992; Mohrman et al., 1995; Powell, 1995; Westphal, Gulati, & Shortell, 1997). When TQM initiatives do not succeed, “missing” elements (e.g., the initiative failed to include employee empowerment) or implementation problems (e.g., there was a lack of technical training in TQM techniques, lack of top management support) are cited to explain the failure (Reger, Gustafson, DeMarie, & Mullane, 1994). Detert, Schroeder, and Mauriel (2000) assert that the inability to change organizational culture may account for the success or failure of innovations like TQM. Perhaps the most common explanation for TQM failure has been that changes in human resource practices have not accompanied changes in technical systems (Snell & Dean, 1992).

A specific human resource factor that may account for the success or failure of TQM programs, seldom considered, is the nature of the individual employees who participate. Kerfoot and Knights (1995) state "the quality literature fails to consider the way that programmes and their content may be differentially defined or interpreted by employees" (p. 229). The implication, therefore, is that individual variability in terms of how TQM is interpreted or the willingness to adopt the principles of TQM is viewed as inconsequential. This study explored whether individual level factors have a bearing on the extent to which employees adopt a TQM orientation (e.g., come to view their workgroup as a team, seek to engage in continuous improvement). In addition, in view of the disproportionate emphasis on organizational level factors within the TQM literature,

we compared the unique contributions of individual and organizational factors in explaining the outcomes of teamwork and continuous improvement.

Literature Review and Theoretical Framework

Although there are divergent views regarding the extent of change involved in implementing TQM, there is general agreement on the importance of top management support and commitment to the success of TQM (Hackman & Wageman, 1995). DeCock and Hipkin (1997) argue that the behavior of senior managers as well as lower level managers may explain the success of a TQM change effort. The consistent emphasis on the role of top management as the key driver for change downplays the role of individual differences in the extent to which employees adopt a TQM orientation.

TQM has not emphasized individual differences because it has traditionally been defined as a system level intervention or management philosophy (Sitkin, Sutcliffe, & Schroeder, 1994). Deming's (1986) work, for example, emphasizes that most variation in work performance is due to common causes, which affect all workers. Consideration of individuals or individual performance has been seen as a distraction from the organization's effort to improve systematically (Lam & Schaubroeck, 1999). However, the neglect of individual differences is difficult to overlook with growing recognition that attitudes play a crucial role in the success of TQM type initiatives (Tiara, 1996). Parker, Wall and Jackson (1997), for example, contend that the achievement of TQM goals is limited without parallel individual and organizational changes. More specifically, Hill (1991) argues that one element of a quality culture is "the internalization of quality and continuous improvement" (p.555). Therefore, to succeed, TQM requires changes in employee mindsets and behaviors that are consistent with quality tenets.

The omission of individual differences by TQM proponents is also unexpected because of its inconsistency with some well-established models that seek to specify the how individual functioning contributes to organizational performance. First, labor economists (e.g., Becker, 1964; Boyer & Smith, 2001) have extensively documented the economic value of human capital investments (i.e., employee skills, values, attitudes, and experiences) for organizations. Employees who already possess attributes that are consistent with TQM philosophy should be advantageous to firms since these human capital features should manifest themselves through decreased training and motivational costs. Another model that supports inclusion of individual differences within TQM is the vocational psychology theory known as person-environment (P-E) fit. This theory has demonstrated utility in explaining a wide variety of work-related outcomes, including job performance, job satisfaction, and stress (Dawis & Lofquist, 1984; Tinsley, 2000). In essence, the P-E fit model asserts that desirable outcomes are optimized when employee (person) desires, values and abilities are congruent with job (environment) characteristics. TQM's emphasis on environmental (system) factors, and its deliberate exclusion of personal factors, seems ill advised, relative to the P-E fit paradigm. Thus, the extent to which individual differences are predictive of adopting TQM beliefs and engaging in TQM activities bears implications for the generalizability of human capital and P-E fit models.

TQM Orientation

TQM advocates are still not in complete agreement on the factors that reflect adoption of a TQM orientation. For example, Dean and Bowen (1994) identify three core components of TQM as consisting of customer satisfaction, continuous improvement and teamwork whereas Reed and Lemak (1998) also include statistical process control, top

management commitment, empowerment and appropriate culture as critical ingredients of TQM. In the present study, we were afforded the opportunity to measure teamwork and continuous improvement, which together are jointly referred to as TQM orientation.

Teamwork. Collaboration and co-operative efforts among employees are frequently mentioned in TQM literature (Blackburn & Rosen, 1993). Initial discussions of teamwork within TQM referred to the use of teams as an organizational form with later treatments emphasizing the quality of group functioning (Deming, 1986; Hill, 1991). Dean and Bowen (1994) define teamwork broadly as a willingness to cooperate and indicate that this could be applied to different levels from the workgroup to inter-organizational activities. At the individual level, the extent to which teamwork has been realized in an organization would manifest itself as an individual's identification with his/her workgroup, his or her perception of workgroup cohesiveness and perceptions of cooperation.

Continuous improvement. Empirical evidence suggests that the success of TQM initiatives requires a change in the way employees construe their work (Lawler, 1994; Parker et al., 1997). Oliver and Davies (1990) in examining the introduction of cellular manufacturing and just-in-time practices found that problems occurred as a result of a lack of change in employees' thinking. Similarly, anecdotal evidence suggests that a common reason underlying employees' resistance to engaging in service quality behaviors is that they see those behaviors as outside the boundaries of their job (Morrison, 1997). Therefore, in the context of TQM, employees need to develop an awareness of the importance of quality, and assume more personal responsibility for achieving it. A broad conceptualization of continuous improvement would involve the recognition of and felt responsibility for quality improvement and, involvement in quality enhancing activities.

At the individual level of analysis, the extent to which continuous improvement has been realized in an organization would be evident in perceived responsibility for quality and participation in activities aimed at improving quality.

Organizational Antecedents of Employee Adoption of TQM Orientation

As noted, there is widespread appreciation of the importance of system-level factors in undertaking a TQM initiative. Two of the most frequently recognized factors are (a) top management support of TQM and (b) supervisory reinforcement of TQM.

Quality concerns have traditionally been the province of top management and TQM initiatives have not proven to be an exception. When TQM "flounders", Reger et al. (1994) contend that it is often because top management has improperly framed it. Numerous other experts on TQM (e.g., Morrow, 1997; Waldman, 1994) have also stressed the importance of perceived top management support to any TQM effort. Waldman (1994) hypothesizes that transformational leadership can be used as a mechanism by which managers can shape individual values so as to enhance teamwork and continuous improvement. As such, the degree to which employees adopt a TQM orientation will be contingent upon the degree to which top management is believed to support TQM principles. Accordingly, we postulate:

Hypothesis 1: Top management support of TQM relates positively to the degree to which individuals adopt a TQM orientation.

Supervisory reinforcement of quality and improvement is hypothesized to facilitate the adoption of a TQM orientation. Previous work suggests that supervisory expectations influence subordinate behavior through a Pygmalion effect, that in turn modifies an individual's behavior based on expectations for that behavior received from another (Eden, 1984). In examining the antecedents of innovative behavior, Scott and Bruce

(1994) reported a positive link between supervisory role expectations and subordinate innovative behavior. Therefore, supervisors who behave in a way that reflects a commitment to TQM are sending signals to their employees regarding expectations and this is likely to influence employee quality and improvement oriented efforts. In addition, the first line supervisor is responsible for involving employees in TQM and the potential for supervisory opposition to a change effort should not be overlooked (Coyle-Shapiro, 1999; Stewart & Manz, 1997). Finally, Steel and Lloyd (1988) amply demonstrated the importance of line supervisor support in the adoption of an early TQM practice, quality circles. We thus hypothesize:

Hypothesis 2: Supervisory reinforcement of TQM relates positively to the degree to which individuals adopt a TQM orientation.

Individual Level Antecedents of Employee Adoption of TQM Orientation

Waldman (1994) is one of a few scholars who have explicitly included individual level constructs in his TQM model. He suggests that three motivational factors can account for work performance differences within TQM systems: (1) organizational commitment, (2) trust in colleagues, (3) higher order need strength. We regard each of these individual differences as baseline indicators of how receptive an employee will be to TQM.

Organizational commitment. Higher levels of affective organizational commitment should predispose employees to be favorably inclined to TQM for several reasons. Employees who feel emotionally attached to an organization will have a greater motivation to make a meaningful contribution to the organization (Meyer & Allen, 1997). Previous empirical research has established a positive link between affective commitment, work effort (e.g., Randall, Fedor & Longenecker, 1990) and organizational citizenship

behavior (Organ & Ryan, 1995). Thus, employees who exhibit a strong sense of organizational commitment are inclined to act in the interests of the organization and are less likely to resist changes (e.g., TQM), so long as they are perceived to be in the organization's best interest. Stated differently, given that highly committed individuals are more likely to behave in ways consistent with organizational goals and proactively contribute to goal attainment, they are more likely to hold perceptions and engage in behaviors consistent with TQM. Accordingly, we hypothesize:

> Hypothesis 3: Organizational commitment relates positively to the degree to which individuals adopt a TQM orientation.

Trust in colleagues. The role of trust in organizational settings has an expansive literature base. One of the most useful ways to interpret trust is to view it as resulting from an individual's perceptions of the characteristics or qualities of specific others (Clark & Payne, 1997). Trust is a multidimensional construct that is based on a belief that the other party is competent, open, concerned and reliable (Mishra, 1996). Although commonly conceptualized at the individual level of analysis, trust has also been found to facilitate collaboration between groups (Davis & Lawrence, 1977) and organizations (Davidow & Malone, 1992). Drawing on this, we focus on an individual's trust in his/her colleagues. Although the antecedents of trust have been considered as situationally determined, it is possible that a tendency to trust may be influenced by dispositional factors. Some researchers argue that some individuals are more dispositionally trusting than others (Rotter, 1967; Mayer, Davis & Schoorman, 1995). As Brockner and Siegel (1996) note "certain individuals simply are more trusting of other people and institutions than are others" (p. 405).

Like organizational commitment, trust in colleagues is a construct that may predict an individual employee's predisposition to adopt TQM. Working collaboratively with others is a fundamental component of TQM (Dean & Bowen, 1994) and individuals' past experiences in working with colleagues are likely to shape opinions about future organizational changes that will require even more collaboration (Jones & George, 1998). In addition, trust leads to information sharing, an integral aspect of TQM (Butler, 1999). Trust in colleagues positively affects the quality of group interactions, personal involvement and participation in group interactions, approachability, group performance, and group problem solving (Dose & Klimoski, 1999). It is especially relevant to TQM in view of its emphasis on interdependence (e.g., internal customers) and decentralized

decision-making (e.g., self-managed work teams). Finally, having high confidence in others (i.e., trust in colleagues) is one indicator of an environment where employees are willing to make organizational-specific investments (Jones & George, 1998), like TQM. We propose then:

Hypothesis 4: Trust in colleagues relates positively to the degree to which individuals adopt a TQM orientation.

Higher order need strength. Higher order need strength refers to the importance an individual attaches to the attainment of higher order needs. As such, it captures an individual's need to experience achievement and satisfaction through work (Warr, Cook & Wall, 1979) and is argued to be a relatively stable personal disposition. Much of the research on higher order need strength has focused on its moderating effects between work redesign and outcomes such as motivation (Hackman & Oldham, 1980). However, the evidence supporting the moderating effect of higher order need strength is mixed (Spector, 1985). There is even less research available on the relationship between individual traits (e.g., higher order need strength) aggregated to reflect group composition and group level outcomes like team performance (Barrick, Stewart, Neubert, & Mount, 1998).

Still, there is ample reason to believe that higher order need strength may predict TQM outcomes. Individuals who have a stronger need to experience achievement and satisfaction through work are more likely to support TQM because of its emphasis on employee involvement, education, and training which satisfy these needs. Stated differently, persons with high need strength levels see TQM as means for establishing better person-job fit. Thus, we expect:

Hypothesis 5: Higher order need strength relates positively to the degree to which individuals adopt a TQM orientation.

Additional and Relative Effects.

The collective thrust of the arguments advanced here is that some individuals will be more predisposed to adopt a TQM orientation than others. Hence we hypothesize, albeit in an exploratory vein, that individual factors will significantly add to the prediction of TQM orientation based on the arguments presented by the human capital and P-E fit models. To the extent that individual factors are found to be useful in the prediction of TQM, it is logical to ask how do the relative effects of individual and organizational factors compare to one another. It is feasible, for example, to speculate that the employment of individuals possessing certain traits and attitudes might be sufficient to achieve a TQM orientation, without organizational support. This would of course be counter to established TQM literature. We examine the effect of individual level factors vis-a-vis organizational level factors with the following hypotheses:

Hypothesis 6: Individual level factors account for additional levels of explained variation in TQM orientation, over and above that accounted for by organizational level factors.

Hypothesis 7: Relative levels of explained variation in TQM orientation associated with individual factors are greater than that explained by organizational level factors.

Methods

Data for this study were obtained from a sample of employees in a multinational UK supplier of engineering and electrical components to the automotive industry. More specifically, data were gathered on three measurement occasions as the organization implemented TQM. Prior to the study, trade union representatives and employees were

contacted and asked to voluntarily participate in the study. All employees were assured confidentiality and informed that they could withdraw from the study at any point.

The first survey was conducted six months prior to the commencement of the TQM intervention and the subsequent two surveys were administered 9 months (time 2) and 32 months (time 3) after the start of the intervention. At Time 1, 200 employees asked to complete the questionnaire and 186 did so, yielding a response rate of 93%. Of the 186, 166 respondents completed the second survey (response rate of 89%) and of these respondents, 118 completed the time 3 survey (response rate of 71%). The attrition was due on the whole to individuals retiring or voluntarily leaving the organization. A small proportion of employees were promoted to supervisory positions during the three years and consequently, we excluded from the subsequent analysis.

T-tests were conducted to ensure that there were no significant differences between those respondents who completed all three surveys and those that did not. We found no significant differences in, supervisory reinforcement, top management support, organizational commitment, trust in colleagues and higher order need strength between the two groups. Overall, we concluded that attrition did not create a significant bias. At time 3, the participant group was 95% male, with a mean age of 45.6 years, a mean organizational tenure of 15.4 years and mean job tenure of 8.81 years. The sample consisted of machine operators (33.3%), craftsmen (26.4%), engineers (14.5%), material/purchase controllers (7.9%), with the remainder of the sample in administrative positions. Demographic, organizational and individual antecedents (i.e., independent variables) were measured at Time 1 or 2 while indicators of TQM orientation were collected at Time 3.

The introduction of TQM at this site began with a training and education program for the senior management team that was cascaded throughout the site. The prevalence of training as a key lever for change is borne out in the practice of TQM (Hackman & Wageman, 1995). In attempting to create an involvement culture as a means to achieving continuous improvement and customer satisfaction, the training covered issues such as leadership styles, empowerment, management of groups alongside the use of TQM tools and techniques. A steering committee was set up to oversee the training process and subsequently to evaluate suggestions for improvement from the problem solving groups set up. In keeping with the traditional TQM philosophy, there was no financial incentive offered to employees for their participation, which was voluntary.

Dependent Variables

TQM orientation. Indicators of teamwork and continuous improvement measured TQM orientation at Time 3. Seven teamwork items, reflecting the extent to which the employees regarded their workgroup as a team, were developed expressly for this study. These items emphasized the extent to which employees felt a part of their workgroups, perceived that their work group worked together effectively, exhibited strong team spirit and cooperation, were willing to sacrifice for the work group, valued the performance of their work group, and encouraged each other to work as a team.

Continuous improvement was measured at Time 3 with eleven items designed for this study. These items are designed to capture different facets of continuous improvement: responsibility for and the awareness of the importance of quality, and, engaging in preventative and proactive quality oriented behaviors. Because the teamwork and continuous improvement measures were designed specifically for use in this study, factor analysis (principal components, varimax rotation) was conducted on the items

composing these scales in order to assess dimensionality and establish the extent to which teamwork and continuous improvement were differentiated. Four factors were extracted having eigenvalues greater than 1, which combined accounted for 64.3% of the variance. The results yielded a single factor for teamwork and three factors for continuous improvement (see Table 1). One teamwork item, "I feel I am really part of my workgroup", exhibited some overlap with a continuous improvement factor and was eliminated. The coefficient alpha for this six-item measure was .90. With respect to continuous improvement, the first factor, 'active involvement' captures the degree to which an individual engages in quality focused behaviors (α = .81). The second factor is labeled 'allegiance to quality' as it captures an individual's acceptance of quality and continuous improvement precepts. One item in this factor, "To know that I had made a contribution to improving things around here would please me", demonstrated similar loadings on two factors and was thus eliminated. The alpha coefficient for this revised factor was .75. The final factor assesses the degree to which an individual feels responsible for quality and is labeled 'personal accountability' (α = .66).

Independent Variables

Supervisory reinforcement of quality and improvement. This scale was specifically designed for this study to assess an individual's perception of the degree to which his/her immediate supervisor displayed commitment to quality and improvement. At time 2, respondents were asked to indicate the extent of their agreement or disagreement to six items relating to the behavior of their immediate supervisor. A sample of items include, 'encourages me to suggest improvements in the organization of my work', 'sets an example of quality performance in his/her day to day activities 'gives me feedback on my suggestions for improvement'. Coefficient alpha for this measure was .89.

Top management support. Top management support for quality was measured at time 2 with a five-item scale designed for this study. Respondents were asked to rate whether top management support has improved over the prior year. Respondents used a seven point scale (7=strongly agree; 1= strongly disagree). A sample of items include, 'top management is more supportive of suggestions to improve the way thing are done around here', 'top management is more committed to Total Quality' 'Total Quality is a greater priority at the site'. Coefficient alpha for this measure was .79.

Organizational commitment. Organizational commitment was measured at Time 1 using six items from the nine item scale developed by Cook and Wall (1980) for use in samples of blue collar employees in the UK. The authors report alpha coefficients of .80 to .87 for two independent samples. In this study, organizational commitment exhibited a coefficient alpha reliability of .76. Two sample items are 'I am quite proud to tell people I work for ___', and 'The offer of a bit more money with another employer would not seriously make me think of changing my job'. A 7-point scale was used ranging from 'strongly agree' to 'strongly disagree'.

Trust in colleagues. Trust in colleagues was measured at time 2 using a six-item scale developed by Cook and Wall (1980) who define trust as " the extent to which one is willing to ascribe good intentions to and have confidence in the words and actions of other people" (p.39). The scale assesses an individual's confidence in the ability of and faith in the intentions of his/her colleagues using a seven point Likert scale. The authors report coefficient alphas of .80 to .85 for their trust in peers scale. A sample of these items include, 'I have full confidence in the skills of my workmates', and 'If I got into difficulties at work, I know my workmates would try and help out'. Trust in colleagues demonstrated a coefficient alpha of .86 in this study.

Higher order need strength. Higher order need strength was measured at Time 1 using the five-item scale developed by Warr, Cook and Wall (1979). This scale captures the importance an individual attaches to the attainment of higher order needs and is derived from the scale developed by Hackman and Oldham (1980). Higher order need strength is viewed as a dispositional characteristic that extends across jobs. Respondents are asked to rate the importance of five job characteristics (e.g., 'extending your range of abilities', 'challenging work') using a "1" 'not at all important' to "7" 'extremely important' scale. Warr, Cook and Wall (1979) report alpha coefficients of .82 to .91 for the measure. In this study, the coefficient alpha of the scale is .85.

All but one of the study measures demonstrated good (> .7) alpha coefficients, with only the personal accountability dimension of continuous improvement exhibiting a marginally acceptable alpha coefficient of .66 (Hair, Anderson, Tatham & Black, 1992).

Procedure

Hierarchical regression analysis was used to test the hypotheses. Prior research has demonstrated that attitudes and behaviors at work can be influenced by demographic characteristics (Mowday, Porter, & Steers, 1982). Therefore, we included four demographic variables (age, gender, job and organizational tenure) to reduce the possibility of spurious relationships based on these types of personal characteristics. These variables were entered in step 1 of the equation followed by the organizational factors in step 2. In the final third step, the individual factors were entered. This method permits an examination of the incremental effects of the individual level predictors beyond the effects of organizational level predictors on the dependent variables required for Hypothesis 6.

In order to test Hypothesis 7, a usefulness analysis (Darlington, 1968) was conducted. Usefulness analysis provides the incremental change in explained variance that is attributable to the set of independent variables that goes beyond the contribution to explained variance of all the other variables in the equation. This analysis compares the change in R^2 associated with a set of independent variables while controlling for the effects of the other variables in the equation. Each set of independent variables (individual and organizational level variables) are entered into a hierarchical equation in separate stages, in each possible ordering to examine the unique variance explained by each set of independent variables in the dependent variable.

Results

Table 2 presents the means, standard deviations, intercorrelations and reliabilities of the scales. Teamwork correlated positively with the three dimensions of continuous improvement (ranging from .26 to .32) and the three dimensions of continuous improvement have correlations ranging from .32 to .41. The factor analysis results and the pattern of these correlations suggest that these measures of TQM orientation are reasonably independent. Factor analysis of the items measuring teamwork and trust in colleagues suggest that these two concepts are reasonably independent (Appendix 1).

The results of the hierarchical regression analyses are presented in Table 3. The results do not provide support for Hypothesis 1 relating to the effects of top management support, when individual level factors are taken into consideration. As Step 3 in Table 3 shows, the significant effects of top management support on teamwork, active involvement, and allegiance to quality disappear once the individual level factors are taken into account. Hypothesis 2 predicted that supervisory reinforcement would relate positively to teamwork and the dimensions of continuous improvement. Supervisory

reinforcement is positively related to teamwork (β= .19, p< .05) and to a lesser extent, active involvement (β= .18, p< .10) but no significant effects were found for the remaining two dimensions of continuous improvement, when individual level factors are taken into account. Thus, hypothesis 2 is supported for teamwork but not for continuous improvement.

Hypothesis 3 predicted that organizational commitment would relate positively to the TQM variables. As the results show, this hypothesis received mixed support. Organizational commitment was positively related to teamwork (β= .20, p< .05) and allegiance to quality (β= .25, p< .01) but no significant effects were found for active involvement or personal accountability. Trust in colleagues, Hypothesis 4, was positively related to teamwork (β= .41, p< .01) as hypothesized but no significant effects were found for the three dimensions of continuous improvement.

Higher order need strength related positively to all three dimensions of continuous improvement: active involvement (β= .21, p< .05), allegiance to quality (β= .31, p< .01) and personal accountability (β= .29, p< .01). However, higher order need strength is not significantly related to teamwork (β= .10, *ns*). In retrospect, this is not surprising since the measure of teamwork captures the degree of cooperation within the workgroup, which is unlikely to be influenced by an individual's desire to experience achievement at work. The positive effect of need strength on willingness to engage in continuous improvement suggests that individual predispositions may play an important role in the degree to which employees adopt a continuous improvement orientation.

In view of the partial support for Hypotheses 3, 4, and 5, we proceeded to test Hypothesis 6. As shown in Table 3, the individual level factors explained unique variance in all the dependent variables above that accounted for by the demographic and

organizational variables. Specifically the individual factors explained additional variance in teamwork ($\Delta F = 11.24$, $\Delta R^2 = .19$, $p < .01$), active involvement ($\Delta F = 3.19$, $\Delta R^2 = .07$, $p < .05$), allegiance to quality ($\Delta F = 8.52$, $\Delta R^2 = .16$, $p < .01$) and personal accountability ($\Delta F = 3.51$, $\Delta R^2 = .09$, $p < .01$). These results strongly support Hypothesis 6.

The results of the usefulness analysis are shown in Table 4. As shown, when the organizational predictors were entered in a subsequent step to the individual level predictors, the incremental variance explained reduces considerably. Specifically, organizational level predictors explained additional variance in teamwork ($\Delta R^2 = .04$, $p < .05$) and active involvement ($\Delta R^2 = .05$, $p < .05$). However the inclusion of the organizational level predictors made no significant contribution to explained variance in allegiance to quality ($\Delta R^2 = .02$, *ns*) and personal accountability ($\Delta R^2 = .00$, *ns*). The results suggest that of the factors examined here, the individual factors are better predictors of TQM orientation than the organizational factors (which produced only a small effect size, Cohen, 1988), thus supporting Hypothesis 7

Discussion

The results of this study intimate that the full and complete value of TQM may not yet be fully appreciated. The findings re-affirm the pervasive benefits of top management support to TQM change efforts and, to a lesser extent, verify the importance of supervisory reinforcement. However, beyond these key organizational practices, the results here suggest additional avenues for continuous improvement in TQM implementation. While the importance of individual dispositional characteristics and attitudes has long been recognized in industrial and organizational psychology, individual differences have not been seen as crucial in the implementation of TQM (e.g., Deming, 1986; Lam & Schaubroeck, 1999). Perhaps the neglect of individual differences reflects a

more generalized under-appreciation of individual differences in management applications. Until recently, individual difference variables beyond ability (e.g., personality traits, work styles, attitudes) have not been used very frequently in personnel selection (Raymark, Schmit, & Guion, 1997). The role of individual differences in team and work group functioning has also only recently been recognized (Barrick et al. 1998; Neuman, Wagner & Christiansen, 1999). Thus there is growing recognition, reinforced by this study, that individual differences merit increased consideration. The idea that continuous improvement orientation can be predicted on the basis of a personality trait like higher order need strength, for example, is certainly intriguing and consistent with recent findings linking other, similar, individual difference constructs such as organizationally-based self-esteem to job performance outcomes (Gardner & Pierce, 1998).

Increased attention to individual differences might also provide insight into when TQM works and when it does not (i.e., relatively little is known about the underlying reasons for TQM success and failure). As Dean and Bowen (1994) note, "TQM initiatives often do not succeed, but there is little theory available to explain the difference between successful and unsuccessful efforts" (p. 393). This lack of theory underlying TQM is reflected in the virtually universalistic assumption that the work *system* is the significant determinant of individual behavior, and, hence, individual differences are inconsequential. The inherent drive to reduce system variability places an undue emphasis on getting the system right, and in doing so, neglects the potentially significant impact of individual dispositions and the interactions between these individual characteristics and the system within which individuals work. Thus, the failure to consider individual differences may indeed explain why TQM sometimes fails to achieve its espoused outcomes.

More broadly speaking, TQM can be viewed as an organizational change effort and there is growing recognition that individuals vary considerably in their receptivity to organizational change (Piderit, 2000; Judge, Thoresen, Pucik, & Welbourne, 1999). It is not well understood how individual differences should be taken into account to facilitate implementation of the intended change as well as assist individuals to accept and cope with organizational change. These are important issues because individual job satisfaction and vocational adjustment may be influenced by individuals' capacity to handle organizational change. What is needed, then, is a stronger conceptual understanding of which individual differences might be associated with openness to and satisfaction with various forms of organizational change. Initial work has begun in this area. Judge et al. (1999), for example, identified positive self-concept and risk tolerance as traits related positively to coping with organizational change. Building on cognitive adaptation and core self-evaluation theories, Wanberg and Banas (2000) found that personal resilience (composed of self-esteem, optimism, and perceived control) related to change acceptance. Morrison and Phelps (1999) found that self-efficacy and felt responsibility related positively to voluntary and constructive efforts by employees to affect organizationally functional change.

In interpreting the findings of this study, the limitations must be considered. First, the specific individual difference variables selected for inclusion in this study were not all dispositional in nature. Individual differences more consonant with receptivity to change, as outlined above, might have been better. On the other hand, our results do suggest that various individual differences may have differential effects on different aspects of TQM adoption. None of the individual differences examined here exhibited a desirable impact on all facets of TQM orientation. Moreover, one individual difference, trust in colleagues,

was found to demonstrate a desirable effect on one outcome (teamwork) but no effect on the other (continuous improvement). However, this may be a consequence of the different foci of measurement: the teamwork measure is more descriptive and places greater emphasis on the group whereas the continuous improvement measure is couched at the individual level and is more subject to self-serving bias.

Another limitation of this study is that all the measures were self-report surveys. Consequently, the observed relationships may have been artificially inflated as a result of respondents' tendencies to respond in a consistent manner. However, more recent meta-analytic research on the percept-percept inflation issue indicates that while this problem continues to be commonly cited, the magnitude of inflation may be over-estimated (Crampton & Wagner, 1994). In addition, the measurement of the independent and dependent variables over three measurement occasions in the present study reduces the potential for common method bias. Two other limitations entail the use of TQM-related measures without established psychometric properties and our inability to include the third generally recognized component of TQM, customer orientation.

Turning to implications, the results of this study suggest that organizational leaders could improve individual employee acceptance of organizational change efforts like TQM through greater consideration of individual differences. Furthermore, this study supports the robustness of human capital and P-E fit models. The additional consideration of individual characteristics to an essentially organizational model proved to be useful, at least in this sample and setting. The precise way in which individual differences might be further used merits additional inquiry but greater consideration of personality constructs like higher order need strength in selection and placement might constitute one

application, especially in work environments were frequent organizational level changes are normative.

In summary, this study addressed a noticeable gap in the research on TQM by investigating effects on two of its most widely held principles, teamwork and continuous improvement. In addition, it sought to focus attention on the antecedents of TQM, which has been rather limited, and often restricted to the role of organizational-level factors. The findings support the importance of organizational antecedents (i.e., supervisory reinforcement of TQM and top management support), especially with respect to teamwork. However, the significance of organizational factors may be over inflated as our findings suggest that individual level factors studied here were relatively better predictors of TQM orientation. Consequently, we suggest that understanding how individuals respond to TQM and other change initiatives would be enhanced through a more balanced perspective that considers both organizational and individual antecedents.

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TABLE 1

Results of factor analysis

	Factor			
Items	1	2	3	4
People in my workgroup work together effectively	.88	.05	.05	.04
There is a strong team spirit in my workgroup	.87	.08	.01	.16
There is a lot of co-operation in my workgroup	.81	.22	.00	.05
The people in my workgroup are willing to put themselves out for the sake of the group	.78	.13	.17	.09
The people in my workgroup encourage each other to work as a team	.76	.03	.28	-.03
I feel I am really part of my workgroup Ψ	.55	.11	.52	-.05
The performance of my workgroup is important to me	.51	.30	.37	.29
I often put forward ideas suggestions without expecting extra rewards	.05	.82	-.05	-.06
Looking for ways of improving how things are done around here is part of my job	.11	.73	.10	.23
In my work area I am always looking for ways to prevent mistakes	.08	.72	.16	-.03
I frequently make suggestions to improve the work of my work area	.17	.65	.16	.16
I have put a lot of effort into thinking about how I can improve my work	.17	.65	.32	.22
The quality of my work is important to the success of the organization	.16	.09	.81	.13
The quality of my work affects the work of other people in ___	.01	.32	.70	-.11
Continuous improvement is essential for the future success of the site	.23	.05	.65	.33
To know that I had made a contribution to improving things around here would please me Ψ	.04	.50	.51	.25
It is up to others to improve how things are done around here	.07	.03	.18	.80
Sometimes I let problems pass because I know someone else will deal with them	.08	.25	.01	.74
Eigenvalue	6.22	2.57	1.52	1.23
Percentage of variance explained	34.6	14.3	8.5	6.9

Ψ items dropped

TABLE 2

Descriptive statistics correlations

	Mean	S.D	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Job tenure T_1	8.81	(7.06)													
2. Age T_1	45.6	(8.50)	.23												
3. Gender T_1	.05	(0.22)	.19	.08											
4. Organizational tenure T_1	15.4	(9.65)	.20	.37	-.01										
5. Supervisory reinforcement T_2	5.03	(1.16)	.16	.10	.07	-.01	(.89)								
6. Top management support T_2	5.01	(1.06)	.01	-.03	.08	-.02	.45	(.79)							
7. Organizational commitment T_1	5.40	(0.90)	.20	.14	.14	-.04	.22	.32	(.78)						
8. Trust in colleagues T_2	5.73	(0.86)	-.02	-.17	-.01	.03	.28	.24	.00	(.86)					
9. Higher order need strength T_1	5.88	(0.77)	.04	-.15	-.11	-.12	.19	.32	.25	.16	(.85)				
10. Teamwork T_3	5.18	(1.13)	-.10	-.12	-.04	-.01	.37	.35	.24	.52	.28	(.90)			
11. CI: Active involvement T_3	5.36	(1.04)	-.10	-.21	-.08	-.13	.22	.28	.17	.00	.32	.32	(.81)		
12. CI: Allegiance to quality T_3	6.30	(0.66)	-.02	-.13	.02	-.17	.16	.32	.36	.07	.43	.26	.41	(.75)	
13. CI: Personal accountability T_3	5.12	(1.34)	-.14	-.11	.05	-.10	.01	.09	.12	.05	.28	.27	.32	.38	(.66)

Correlations > .23 are statistically significant at p< .01. Correlations > .19 are statistically significant at p <.05.

TABLE 3
Hierarchical regression analysis for individual and organizational antecedents predicting adoption of a TQM orientation (teamwork and continuous improvement)

				Continuous Improvement								
	Teamwork			**Active Involvement**			**Allegiance to quality**			**Personal Accountability**		
Predictor	$Step_1$	$Step_2$	$Step_3$	$Step_1$	$Step_2$	$Step_3$	$Step_1$	$Step_2$	$Step_3$	$Step_1$	$Step_2$	$Step_3$
Step 1: Demographics												
Job tenure T_1	-.08	-.14	-.17*	-.04	-.07	-.11	.02	-.01	-.06	-.12	-.13	-.18
Age T_1	-.12	-.15	-.07	-.17	-.17	-.19*	-.09	-.08	-.08	-.07	-.07	-.04
Gender T_1	-.01	-.04	-.04	-.05	-.08	-.06	.02	.00	.03	.08	.07	.11
Organizational Tenure T_1	.05	.08	.06	-.06	-.05	.00	-.15	-.14	-.07	-.04	-.04	.00
Step 2: Organizational Factors												
Supervisory reinforcement T_2		.33**	.19*		.15	.18+		.03	.01		.00	-.02
Top management support T_2		.21*	.06		.21*	.14		.30**	.14		.08	-.02
Step 3: Individual factors												
Organizational commitment T_1			.20*			.09			.25**			.09
Trust in colleagues T_2			.41**			-.15			-.02			.01
Higher order need strength T_1			.10			.21*			.31**			.29**
F	.72	5.41**	8.38**	1.64	3.38**	3.45**	1.17	3.07**	5.17**	1.08	.86	1.78*
Change in F	.72	14.44**	11.24**	1.64	6.53**	3.19*	1.17	6.66**	8.52**	1.08	.44	3.51**
Change in R^2	.02	.20	.19	.05	.09	.07	.04	.10	.16	.03	.00	.09
Adjusted R^2	.00	.18	.37	.02	.10	.16	.01	.09	.24	.00	.00	.06

** $p \leq .01$ *$p \leq .05$ + $p \leq .1$

Table 4

Usefulness analyses: Comparisons of the R^2 incremental change for each step

Step/Independent variable	Incremental change explained
Dependent variable: Teamwork	
Organizational variables entered first	.20**
Step 2. Organizational predictors	.19**
Step 3. Individual predictors	
Individual variables entered first	.35**
Step 2. Individual predictors	.04*
Step 3. Organizational predictors	
Dependent variable: Active Involvement	
Organizational variables entered first	.09**
Step 2. Organizational predictors	.07**
Step 3. Individual predictors	
Individual variables entered first	.11**
Step 2. Individual predictors	.05*
Step 3. Organizational predictors	
Dependent variable: Allegiance to Quality	
Organizational variables entered first	.10**
Step 2 Organizational predictors	.16**
Step 3 Individual predictors	
Individual variables entered first	.25**
Step 2 Individual predictors	.02 ns
Step 3 Organizational predictors	
Dependent variable: Personal Accountability	
Organizational variables entered first	.00 ns
Step 2 Organizational predictors	.09**
Step 3 Individual predictors	
Individual variables entered first	.09**
Step 2 Individual predictors	.00 ns
Step 3 Organizational predictors	

* $p<.05$ ** $p<.01$. The values represent the additional change in R^2 achieved by entering the variables specified at each step.

APPENDIX 1

Results of factor analysis of teamwork and trust in colleagues

	Factor	
Items	1	2
There is a strong team spirit in my workgroup	.87	.20
There is a lot of co-operation in my workgroup	.82	.27
The people in my workgroup are willing to put themselves out for the sake of the group	.81	.23
People in my workgroup work together effectively	.80	.36
The performance of my workgroup is important to me	.70	-.11
The people in my workgroup encourage each other to work as a team	.69	.26
I can trust the people I work with to lend me a hand if I need it	.10	.86
Most of my workmates can be relied upon to do as they say they will do	.12	.84
I have full confidence in the skills of my workmates	.29	.80
If I got into difficulties at work I know my workmates would try and help out	.12	.76
Most of my fellow workers would get on with the job even if supervisors are not around	.13	.70
I can rely on other workers not to make my job more difficult by careless work	.26	.49
Eigenvalue	5.57	2.09
Percentage of variance explained	46.5	17.4