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TOTAL QUALITY MANAGEMENT IMPLEMENTATION AND COMPETITIVE ADVANTAGE: THE ROLE OF STRUCTURAL CONTROL AND EXPLORATION

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We explored the relationship between the degree to which total quality management (TQM) practices were adopted within organizations and the corresponding competitive advantages achieved. We found relatively strong support for this relationship. In addition, our data showed some support for the moderating influence of organizational structure on TQM implementation effectiveness. Specifically, two measures of organizational structure, labeled "control" and "exploration," were found to offer independent and interdependent influences on the financial performance of firms implementing TQM programs.

Much has been written about total quality management (TQM) practices and the many benefits that these practices bring to the organization that successfully adopts them. Notably, a considerable number of organizations have tried to implement these practices and have failed to achieve much, if any, competitive advantage, while many other organizations have implemented TQM with great success. Some observers have argued that the problem lies either with the failure to fully implement all of the key TQM practices (Hackman & Wageman, 1995) or with the absence of complementary assets that must be combined with TQM to achieve competitive advantage (Carmen et al., 1996; Waldman & Gopalakrishnan, 1996).

Exacerbating this problem is the situation whereby "research is not providing the corrective function for TQM that it could and should" (Hackman & Wageman, 1995: 339). For instance, a reason given for the lack of conclusive evidence in the literature lies in the treatment of TQM as a "discrete phenomenon" (Westphal, Gulati, & Shortell, 1997). In fact, Hackman and Wageman found that only 4 percent of the 99 articles published between 1989 and 1993 on TQM "assessed the degree to which TQM interventions actually were in place" (1995: 321). Given the complexity and pervasiveness of implementing TQM in an organization (Westphal et al., 1997), it is important to assess the *degree* to which TQM practices have been implemented when evaluating TQM's relationship with competitive advantage.

In addition, it has been argued that for an organization to realize the value of a TQM implementation, it must have an internal organizational structure that is capable of fully supporting the implementation (Waldman & Gopalakrishnan, 1996). According to Shea and Howell (1998), the preferred structure for organizations that implement TQM balances the need for control of activities with the flexibility needed to respond and adapt quickly to the changing marketplace. It is thus important to assess organizational structure when evaluating an organization's TQM implementation. The purpose of this study was to examine the degree to which a comprehensive set of TQM practices was implemented in a set of organizations, the effect of organizational structure on implementation effectiveness, and the corresponding competitive advantages gained through TQM. The setting for this examination was the general medical hospital industry. This industry is particularly appropriate for the study of the effectiveness of TQM program implementation since it commenced using TQM as an industrywide recipe for success in the mid to late 1980s and continues this effort to the present day (Westphal et al., 1997).

THEORETICAL DEVELOPMENT

Recent literature has begun to describe and evaluate TQM as a potential source of competitive advantage (Powell, 1995). The implementation of TQM is accomplished through a set of practices that supports the TQM philosophy (Dean & Bowen, 1994). TQM philosophy dictates that the practices

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function as an interdependent system (Hackman & Wageman, 1995) that can combine with other organizational assets to generate competitive advantage (Powell, 1995). As Schendel (1994) pointed out, competitive advantage is based not on individual assets or practices that can be easily duplicated, but on the combination of a series of assets that he labeled "compound assets." Drawing from the recent literature on TQM (Dean & Bowen, 1994; Hackman & Wageman, 1995; Powell, 1995), we identified seven key or common practices that combine to support the TQM philosophy. These practices are: top management team involvement, adoption of a quality philosophy, emphasis on TQM-oriented training, focus on the customer, continuous improvement of processes, management by fact, and use of TQM methods.

To gain the full potential of TQM, a hospital must implement all seven of these TQM practices to the greatest extent possible. According to industry experts, proper implementation of TQM in hospitals is a critical determinant in enhancing organizational performance (Shortell et al., 1995; Westphal et al., 1997). As Carmen and his colleagues (1996) pointed out in their study of TQM in hospitals, some organizations are much more deliberate and comprehensive in their implementation of TQM than are others. This variability in implementation efforts emphasizes the importance of focusing on the depth of the implementation, not just on the mere presence of a TQM program. Unfortunately, very few past researchers have attempted to so measure degree of implementation (Hackman & Wageman, 1995).

Preliminary evidence from Powell (1995) indicated that TQM-adopting firms do obtain a competitive advantage over firms that do not adopt TQM. Consequently, theory and research suggest that the greater the degree to which a comprehensive set of TQM practices is adopted by a hospital, the greater the competitive advantages achieved, and the higher the hospital's performance. Therefore, the following hypothesis is offered:

Hypothesis 1. The degree of implementation of TQM practices in a hospital is positively related to the hospital's performance.

A number of scholars have argued that a supportive organizational structure is needed to enhance the effectiveness of TQM implementation (Shea & Howell, 1998; Waldman & Gopalakrishnan, 1996). Sitkin, Sutcliffe, and Schroeder (1994) argued that the effectiveness of total quality management depends on an organization's ability to balance control and learning. The need for control is evident in TQM's use of formal scientific methods for the elimination of variation using statistical process control (Hackman & Wageman, 1995). The need for learning is evident in TQM's emphasis on organizational learning and continuous improvement (Grant, 1996).

Shea and Howell (1998) presented compelling arguments that the monodimensional mechanistic/organic structural scale proposed by Burns and Stalker (1961) is no longer appropriate in a TQM environment. Instead, they suggested two dimensions—the first focusing on level of standardization and the second on level of decentralization. They argued that standardization of TQM techniques and feedback loops helps an organization to control its systems and processes. However, decentralization is also necessary to allow employees to explore and experiment with creative process improvement ideas.

Recent theory and research on organizational structure, independent of the TQM literature, is coming to the same conclusion. Eisenhardt and Tabrizi (1995) argued that organizational structure must have a stabilizing (that is, controlling) and creative (exploring) impact on organizations, especially in turbulent environments. Similarly, Sutcliffe, Sitkin, and Browning (1999) argued that organizational structure must both standardize operations across an organization to ensure the reliability of outcomes (the control dimension) and at the same time keep the organization open and flexible to new ideas (the exploration dimension). Perhaps summing this up best, Stacey maintained that organizations need to maintain a creative tension "between the clear-cut, rigid forms of control required to handle the knowable and the spontaneity necessary to handle the unknowable" (1992: 184).

Evidence from recent studies in the hospital industry provides some support for the need to have both the control and exploratory dimensions of structure for the successful implementation of TQM. Carmen and his colleagues (1996), in their in-depth study of ten hospitals, found that a continuous learning culture enhanced the relationship between continuous improvement and hospital performance. Shortell and coauthors (1995) found similar results, but they also emphasized the need for a formal, strategic quality plan to be present to ensure superior efficiency. Finally, Motwani, Sower, and Brashier (1996) prescribed a structured, standardized approach for the successful implementation of TQM in hospitals. Given this theory and preliminary research, the following hypotheses are advanced:

Hypothesis 2. In a hospital characterized by a greater focus on control in its structure, the

degree of implementation of TQM practices will be more strongly, positively related to hospital performance.

Hypothesis 3. In a hospital characterized by a greater focus on exploration in its structure, the degree of implementation of TQM practices will be more strongly, positively related to hospital performance.

METHODS

Data Collection

The study was conducted within a single industry, general medical hospitals (Standard Industrial Classification code 8062). By controlling for overall industry effects, we were able to limit confounding influences and focus on the key variables of interest. In addition, TQM has been recommended to the members of this industry as a strategy that will assist them in dealing with their turbulent environment, although the degree of implementation has varied considerably.

Both primary and secondary data were gathered for the analysis. From a list of 55 standard metropolitan statistical areas (SMSAs) in the United States that contained at least 15 general hospitals, we randomly selected 19 metropolitan areas. Then, in the fall of 1996, we sent questionnaires to the chief executive officer and the director of quality at each of the 512 hospitals in these 19 SMSAs. Finally, we combined the survey data with secondary information available for the responding hospitals.

We received at least one questionnaire from each of 193 hospitals, achieving an overall response rate of 38 percent. From 36 of these (19%), we received questionnaires from both the CEO and the director of quality; from 56 (29%), we only got back the CEO questionnaire; and from 101 (52%), we only received the questionnaire sent to the director of quality. These responses resulted in a total of 229 returned surveys and an individual response rate of 22 percent.

In an effort to assess the potential for response bias, we made comparisons across a number of available variables for both the responding and the nonresponding hospitals for the 19 SMSAs using data from the 1995 American Hospital Association's Annual Survey of Hospitals. The mean results for nonrespondents did not differ significantly from those for respondents when we compared assets, number of employees, profitability, or services offered. As a result, there does not appear to be systematic response bias in the financial and operating characteristics of the hospitals sampled.

Variables and Measures

Organizational performance. Organizational financial performance, adjusted for industry effects, has been used as a proxy for the supranormal rents associated with competitive advantage (Montgomery & Wernerfelt, 1988; Powell, 1995). To ensure the completeness and timeliness of the information, we obtained the principal measure of performance for the study directly from the respondents in our survey instrument. There are many precedents in the literature for obtaining performance information on a primary basis (e.g., Covin, Slevin, & Schultz, 1994; Powell, 1995). The five-item measure used in this study was adapted from scales used by Powell (1995) and Ramanujam, Venkatraman, and Camillus (1986). Specific items for this scale are listed in the Appendix.

The coefficient of reliability for the perceived performance measure was .90. To further verify the reliability of this measure, we conducted a one-way analysis of variance (ANOVA) to test the similarity among the within-organization responses (Amason, 1996). The results revealed that the between-hospitals variance was significantly greater than the within-hospital variance ($F = 3.80$, $p < .001$), suggesting substantial agreement among the within-hospital respondents. Direct comparison was also made across the five-item scales received from the 36 hospitals that had multiple respondents. On these five-point scales, 93 percent of the responses were exactly the same or within one category. As an additional test, these responses were also split into two groups, those from the directors of quality and those from the CEOs. *T*-tests conducted on the means of each of the performance items demonstrated no significant differences between the two groups.

To test the convergent validity of this perceptual measure, we averaged the 1996 and 1997 returns on assets (ROAs) relative to those of competitors for 57 hospitals in 6 of the 19 SMSAs in the original sample. Data were obtained from the American Hospital Directory database. The correlation between the two-year average archival ROA relative to competitors and our perceptual performance measure was significant ($r = .40$, $p < .01$).

In addition to the perceptual measure, we also obtained each hospital's overall score from the latest audit conducted by the Joint Commission on Accreditation of Healthcare Organizations. This industry-expert-rated measure is based on a comprehensive audit of 49 standards related to internal hospital processes conducted once every three years. Hospitals are under considerable institutional pressure to perform well in these areas (Westphal et al.,

1997). Thus, although this measure is not a direct assessment of competitive advantage, it may be an alternative proxy for measuring competitive advantages gained through successful TQM programs (Coff, 1999). To more fully assess the relationship between TQM and organizational performance, we tested the hypotheses using both the perceived financial performance measure and the industry expert rating of performance.

TQM practices. The seven TQM practices examined in our analysis have been identified in recent research (Dean & Bowen, 1994; Hackman & Wageman, 1995; Powell, 1995); the Appendix gives the specific scales and items used. We sought to comprehensively gauge the degree to which TQM had been implemented within an organization with these 36 items. A factor analysis of the items confirmed the existence of seven factors. Each item loaded on the expected scale, and eigenvalues ranged from 0.91 to 17.5, with 72 percent of the cumulative variation explained ($p < .001$). Reliability coefficients (alphas) and one-way ANOVAs were calculated; the alphas ranged from .85 to .92, signifying that the scales were reliable. Furthermore, the *F*-tests associated with the one-way ANOVAs for each of the scales were significant. In sum, our scales appeared to demonstrate acceptable psychometric properties.

We constructed the factor scores by averaging each organization's item responses for the respective scales. These seven factor scores were then subjected to a final factor analysis to determine if the TQM construct represented one or more latent variables. Both the principal components and maximum likelihood techniques provided similar results, with all seven of the variables loading on a single factor. The eigenvalue for this factor was 4.89, which explained 70 percent of the variation. Therefore, in our data set, only one factor was identified representing the construct of degree of TQM practices adopted. We computed the aggregated average of these seven variables to create the TQM practices variable that was used in the subsequent analysis. The coefficient alpha for this scale was .93.

Organizational structure. To measure organizational structure, we adapted the seven-item scale originally developed by Khandwalla (1977) and recently used by Covin et al. (1994). The items were factor-analyzed to verify the existence of two distinct factors representing control and exploration. This analysis confirmed the existence of these two factors in our data set. The first factor, structural control, accounted for 46 percent of the variance, with an eigenvalue of 2.29. The three items loading on this factor measured the degree that the organizational structure emphasized the control of procedures, systems, and job descriptions. The reliability associated with this scale was .66. The second factor, structural exploration, consisted of two items measuring the exploration capability of the organizations with respect to allowing the flow of financial and operating information throughout the organization and the freedom to depart from past practices to adapt to a changing environment. This factor had an eigenvalue of 1.06 and accounted for 21 percent of the variance. The reliability of this scale was .67. Once again, the specific items used are listed in the Appendix.

These two scales should be considered exploratory since this is the first study to use these two distinct factors to represent the control and exploration aspects of organizational structure. Khandwalla's (1977) original scale demonstrated a reliability of .68, similar to the ones exhibited by these two scales. Nunnally (1978) considered this level of reliability acceptable for the early or initial stages of basic research. Future studies should increase the number of items in each scale to increase their reliability.

Control variables. Following prominent studies of the hospital industry (e.g., Ketchen, Thomas, & Snow, 1993), we used the number of hospital beds as a proxy for organization size. We obtained these data from the 1995 American Hospital Association's Annual Survey of Hospitals.

Hospital ownership has also been recognized as a potentially important variable in this industry. For-profit and not-for-profit hospitals can be expected to have different organizational goals and unique groups of stakeholders (Zajac & Shortell, 1989). Thus, it is important to classify each organization into one of these two categories (1 = "for profit," 2 = "not-for-profit"). These data were collected from the 1996 edition of the *Hospital Blue Book.*

Since the market for resources is regional for hospitals (Ketchen et al., 1993), it is important to include a measure of market growth in the SMSA in which the hospital operates. The growth rate for each local market area was calculated using the linear trend in the natural logarithm of the population estimates. The population data (1991–95) were obtained from the U.S. Census Bureau.

The level of competition in the hospital industry may also influence organizational performance, and it is measured at the local market area, or SMSA. In line with recent research (Boyd, 1990), we chose to use a Herfindahl index to measure this construct in our study. Calculated using market share data as input, the Herfindahl index represents perfect competition when it registers a score of 0, and a score of 1 portrays a monopoly situation.

Market share information for 1994 was obtained from the 1995 American Hospital Association's Annual Survey of Hospitals for all hospitals in the 19 SMSAs represented in the study.

RESULTS

The descriptive statistics of the variables used in the hypothesis tests are displayed in Table 1. The collinearity diagnostics, including the variance inflation factors, all indicated that multicollinearity was not a problem. In addition, Table 1 contains the means and standard deviations of the seven individual TQM practices detailed in the Appendix along with their correlations relative to the two performance variables.

Tables 2 and 3 show the results of hierarchical regression analyses. Hypothesis 1 was tested by comparing the increase in variance explained from model 1 to model 2 (Tables 2 and 3). Model 1 represents the regression of the control variables on the performance variable (perceived financial performance in Table 2 and industry-expert-rated performance in Table 3), and model 2 adds TQM practices to both sets of regressions. In each instance, the test statistic (F; Cohen, 1968) for the change in the multiple squared correlation statistic (R^2) is significant.

The results indicate that the degree of TQM practices implemented is positively and significantly related to both the perceived financial performance of a hospital ($t = 2.93$, $p < .01$) and its industry-expert-rated performance ($t = 2.00$, $p < .05$). Therefore, Hypothesis 1 is well supported by our data. The results indicate that the degree to which TQM practices are implemented is significantly related to both of these measures of organizational performance, providing evidence of the robustness of this relationship.

To explore the moderating influence of organizational structure postulated in Hypotheses 2 and 3, we created model 3 by adding the first-order interactions between structural control and exploration and TQM practices to model 2 for both performance measures. The associated F-tests displayed in Tables 2 and 3 signify that significant additional variance is explained with respect to financial performance in Table 2, but not with respect to industry-expert-rated performance in Table 3. Therefore, we found some empirical support for the moderating impact of organizational structure with respect to organizational performance, since each of the two-way interaction terms, TQM with structural control ($t = -2.88$, $p < .01$) and TQM with structural exploration ($t = 2.19$, $p < .05$), was significant. These results partially support Hypotheses 2 and 3.

To determine the exact nature of these moderating relationships identified in Table 2, we conducted additional interpretative analyses. Using standard graphical techniques, we found that hospitals operating with relatively high structural control exhibited a stronger relationship between the TQM practices implemented and financial performance and that hospitals with relatively lax structural controls did not demonstrate a significant re-

TABLE 1
Means, Standard Deviations, and Correlations[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8
1. Perceived financial performance	3.59	0.66								
2. Industry-expert-rated performance	93.11	4.26	.06							
3. TQM practices[b]	3.55	0.62	.33	.23						
3a. TMT involvement	3.90	0.77	.33	.22						
3b. Quality philosophy	3.89	0.66	.38	.22						
3c. TQM-oriented training	3.53	0.87	.25	.21						
3d. Customer driven	3.57	0.70	.31	.13						
3e. Continuous improvement	3.56	0.72	.26	.15						
3f. Management by fact	3.46	0.74	.30	.20						
3g. Total quality methods	2.93	0.75	.20	.23						
4. Market growth	1.08	0.75	.01	.07	−.07					
5. Level of competition	0.07	0.03	.08	−.06	.07	.26				
6. Structural control	13.02	2.94	.03	−.17	.05	−.09	−.04			
7. Structural exploration	9.69	2.24	.27	.09	.54	−.11	.10	.37		
8. Organization size	287.40	226.60	−.01	.11	−.01	−.21	−.05	.04	−.05	
9. Organization ownership	1.86	0.35	−.18	−.25	−.12	−.25	−.07	.06	−.10	.18

[a] Correlations > .15 are significant at $p < .05$.

[b] The seven individual TQM practices included in the aggregate TQM practice measure are listed separately to illustrate their individual means, standard deviations, and correlations with the two performance measures.

TABLE 2
Results of Regression Analysis of the Degree of TQM Practices Implemented and Perceived Financial Performance[a]

	Model 1		Model 2		Model 3		Model 4	
Variable	**β**	***t***	**β**	***t***	**β**	***t***	**β**	***t***
Organization size	0.05	0.61	0.02	0.29	0.06	0.79	0.06	0.87
Organization ownership	−0.15	−1.93	−0.12	−1.60	−0.10	−1.39	−0.13	−1.66
Market growth	−0.01	−0.17	−0.01	−0.13	−0.01	−0.08	−0.01	−0.16
Level of competition	0.06	0.83	0.03	0.43	0.08	1.06	0.07	0.92
Structural control	−0.07	−0.90	−0.03	−0.39	0.00	0.01	−0.09	−1.02
Structural exploration	0.29	3.56***	0.14	1.56	0.15	1.70	0.18*	2.01*
TQM practices			0.25**	2.93**	0.31***	3.62***	0.26**	2.94**
TQM × control					−0.22**	−2.88**	−0.17*	−2.10*
TQM × exploration					0.17*	2.19*	0.17*	2.22*
TQM × control × exploration							0.17*	2.05*
R^2	.11		.14		.20		.22	
F	3.43**		3.96***		4.46***		4.52***	
ΔR^2			.03		.06		.02	
F			7.35**		6.41**		4.64*	

[a] $n = 193$.
* $p < .05$
** $p < .01$
*** $p < .001$
All two-tailed tests.

TABLE 3
Results of Regression Analysis of the Degree of TQM Practices Implemented and Industry-Expert-Rated Performance[a]

	Model 1		Model 2		Model 3		Model 4	
Variable	**β**	***t***	**β**	***t***	**β**	***t***	**β**	***t***
Organization size	0.19*	2.44*	0.18*	2.24*	0.18*	2.18*	0.17*	2.11*
Organization ownership	−0.26**	−3.18**	−0.25**	−3.09**	−0.25**	−3.08**	−0.24**	−2.93**
Market growth	0.04	0.52	0.04	0.46	0.04	0.47	0.04	0.48
Level of competition	−0.09	−1.12	−0.09	−1.16	−0.09	−1.08	−0.08	−1.03
Structural control	−0.19*	−2.34*	−0.17*	−2.06	−0.12	−1.32	−0.07	−0.72
Structural exploration	0.14	1.69	0.04	0.43	0.04	0.38	0.03	0.27
TQM practices			0.18*	2.00*	0.16	1.69	0.18	1.86
TQM × control					−0.10	−1.21	−0.13	−1.40
TQM × exploration					−0.13	−1.55	−0.13	−1.55
TQM × control × exploration							−0.08	−0.81
R^2	.14		.16		.19		.19	
F	3.96**		3.93***		3.71***		3.40***	
ΔR^2			.02		.03		.00	
F			4.06**		2.93		.57	

[a] $n = 193$.
* $p < .05$
** $p < .01$
*** $p < .001$
All two-tailed tests.

lationship between TQM practices and financial performance.

Similarly, hospital structures with a relatively high level of structural exploration appeared to enhance the relationship between the TQM practices implemented and financial performance. In con-

trast, the relationship between TQM and financial performance was weakened in those firms with lower levels of structural exploration. Figure 1 displays the graphs of these contingent effects. These findings offer new and practical insights into the complementary nature of organizational structure and TQM practices.

Our results suggested additional ad hoc analysis in light of the work of Sutcliffe and colleagues (1999). These researchers argued that control and exploration processes may be "synergistic" within an organization, signifying that these processes may be interdependent and mutually reinforcing. To test this possibility, we added a three-way interaction term to model 3; the results appear as model 4 in Tables 2 and 3. The three-way interaction, TQM with control and exploration, is significant and positive ($t = 2.05$, $p < .05$) for the financial performance equation, but it is not significant for industry-expert-rated performance. This finding provides some tentative support for the arguments of Sutcliffe et al. (1999), and it suggests that the relationship between the degree of TQM implementation and financial performance is influenced by levels of both structural control and exploration.

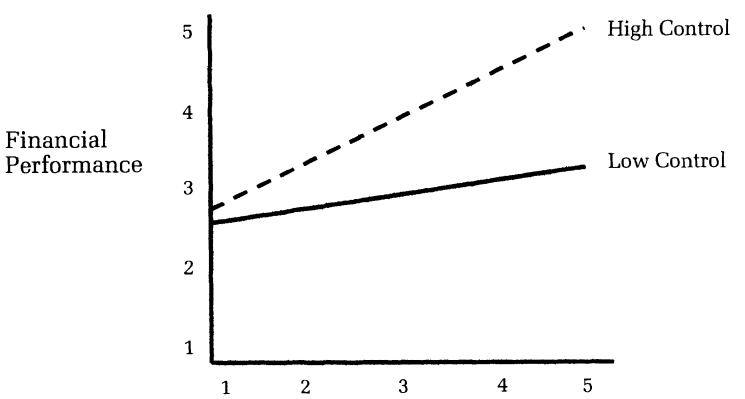
DISCUSSION AND CONCLUSIONS

Theoretical Implications

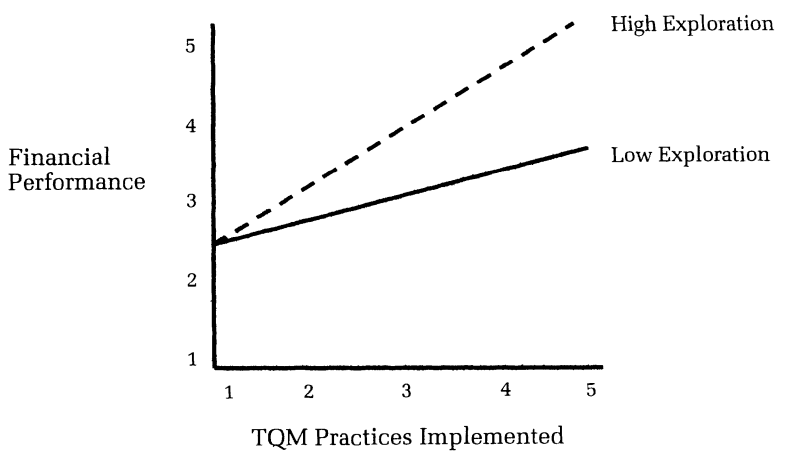
This study has addressed whether the capabilities generated by TQM are related to competitive advantage. With respect to our principal hypothesis, we found strong empirical support for a positive relationship between the degree of TQM implementation and organizational performance. We also found some empirical evidence that this relationship between TQM implementation and orga-

FIGURE 1
Conditional Effects on the Relationship between TQM Practices Implemented and Financial Performance

(1a) Structural Control



(1b) Structural Exploration



nizational performance was moderated by organizational structure.

The results of this study contribute to the rapidly developing total quality management literature (Westphal et al., 1997) in that it is the first large-scale study to confirm the expected positive relationship between the degree of implementation of TQM practices and overall organizational performance. Recognizing that TQM practices develop along different time frames within each organization (Carmen et al., 1996), identification of the extent to which these practices have been implemented throughout an organization allows for a more complete understanding of TQM's value (Hackman & Wageman, 1995). In short, TQM appears to be more than an either/or proposition. Our study reveals that one important aspect of TQM success is the degree to which the entire TQM philosophy has been implemented; the rhetoric that surrounds it and the mere presence of a TQM program are not sufficient for success. For example, one of the respondents from a hospital in Phoenix reported that "although the top administrators give CQI [continuous quality improvement] lip service, their actions do not support it and few resources are provided." Future researchers are encouraged to include a measure of degree of implementation when studying TQM programs.

Westphal and his colleagues (1997) have pointed out that the information emanating from large-scale empirical research on TQM has been scarce and inconclusive. The most noteworthy exception is Powell's (1995) study of 39 firms that implemented some TQM practices. He found that although TQM-adopting firms outperformed nonadopters, many of the basic TQM practices failed to correlate directly with organizational performance. We have built on Powell's (1995) findings by examining the progress that each studied hospital made "moving up the experience curve" toward full implementation of a comprehensive set of TQM practices. Notably, we found that the hospitals that had more completely implemented a comprehensive array of TQM practices outperformed those that had less well-developed programs.

Powell (1995) also wrote that complementary organizational resources might need to be in place for some of the TQM practices to be effective, but he did not empirically investigate this relationship. Our study breaks new ground in the TQM literature by identifying a complex relationship between organizational structure and TQM implementation success. This finding supports recent conceptual arguments that both control and learning are necessary in order to take advantage of TQM in changing environments (Sitkin et al., 1994).

Hospitals that exhibited strong emphasis on structural *control* of procedures, operations, and work activities exhibited a stronger relationship between their TQM implementation and financial performance. This finding supports observations made by Lillrank, Shani, Kolodny, Stymne, Figuera, and Liu (1998) that continuous improvement can effectively be integrated into an organization via job descriptions and other administrative procedures. By standardizing the use of specific TQM tools and techniques within an organization's formal procedures, it appears that hospitals can continuously improve effectiveness and efficiency (Shortell et al., 1995).

Hospitals that demonstrated a higher level of structural *exploration* also displayed a stronger relationship between TQM implementation and financial performance. It appears that organizations that provide employees access to key information and empower them to adapt their processes to environmental changes are better able to use TQM for competitive advantage. This finding reinforces Hackman and Wageman's (1995) arguments that TQM needs a strong learning environment in which to function since employees are expected to use data about their work processes for continuous improvement.

Our findings also provide critical insights for the recent dialogue on the need to balance both control and learning within an organization (Eisenhardt & Tabrizi, 1995; Sutcliffe et al., 1999). Not only did we find that both structural concepts enhanced the relationship between TQM implementation and financial performance separately; we also found that control and exploration appeared to work synergistically to enhance this relationship even further. Sutcliffe and colleagues (1999) presented three possible scenarios in their discussion of the need to balance control and learning. The first portrays the balance as antithetical, with emphasis on either control or learning at the expense of the other. The second scenario describes control and learning as orthogonal concepts that are each important to organizations. The third scenario presents a synergistic system whereby control and learning are mutually reinforcing. Sutcliffe and colleagues discuss an example of a high-tech manufacturing firm that demonstrated that breakthrough learning within their TQM system could be quickly routinized into their organizational processes for efficiency. Our findings in the hospital industry provide some new evidence that TQM-adopting organizations have also experienced the synergistic effects of balancing structural control and learning.

The recent metaphor of jazz improvisation in organizational theory (Weick, 1998) has heightened

our awareness that organizations must balance apparently paradoxical processes in a manner that allows them to continually adapt to their environments. Our finding with respect to the complementary impact of two seemingly opposing structure variables supports the implications found in this theoretical insight.

However, our conclusions must be tentative about the moderating impact of structure on TQM implementation success because we failed to find a moderating effect of organizational structure on implementation success for the industry-expert-rated measure of performance. One possible explanation for this nonfinding is that the financial performance measure is a more valid and reliable proxy of competitive advantage than the expert-rated-performance measure. Buttressing this argument are the high correlations (Table 1) between all seven of the TQM practices and the financial performance measure (average $r = .29$); only five of the seven TQM practices were correlated with the expert-rated-measure, however (average $r = .19$). Notably, the two practices that were not correlated were "customer driven" and "continuous improvement"—both known to be critical to competitive advantage (e.g., Dean & Bowen, 1994). Future research should explore multiple performance measures in other industries to determine if our lack of findings was due to the problems with our performance measures or due to a more complicated relationship than was explored in this study.

Managerial Implications

This study has important implications for managers. First, it encourages them to invest in the time and resources necessary to implement comprehensive TQM programs, not just selected aspects of TQM. It also suggests that seven specific practices—top management team involvement, quality philosophy, TQM-oriented training, customer-driven changes, continuous improvement, management by fact, and TQM techniques—appear to operate as an integrated system.

Second, this study suggests the importance of ensuring that a supportive organizational structure is in place. Managers have been offered rather simplistic structural prescriptions in the past (Eisenhardt & Tabrizi, 1995), but the evidence from this study provides tentative support for the argument that firms must balance both control and exploration in order to use TQM in a way that is both effective and efficient. An organization seems to need to provide the structural mechanisms that enable TQM techniques to be woven into its fabric (Lillrank et al., 1998) while allowing for the development and integration of new knowledge and ways to create customer value (Grant, 1996). If these things do not happen, firms may encounter a situation in which TQM doesn't add value.

Limitations

Despite these encouraging results, several limitations of this study should be emphasized. First, the sampling frame limits the generalizability of the results. The organizations in this study were drawn from a single industry, general hospitals. Although this sampling frame allowed us to control for global environmental factors and to provide results for a major service industry, it does limit the generalizability of results. Since health care involves life-and-death decisions involving activities that are often highly regulated, the insights gained here about total quality practices may not apply to other industries.

The two performance measures used in this study must also be viewed within the context of the hospital industry. The use of perceived financial performance is appropriate for most industries, but the industry-expert-rated measure is specific to the hospital industry and represents a hospital's ability to meet institutional demands. This industry-specific measure appears to be little related to a hospital's ability to earn superior rents, focusing instead on the ability to achieve process objectives ultimately related to appropriate patient care. Coff (1999) presented strong arguments that rents associated with competitive advantage can be shared across multiple stakeholders. If this is true, then the use of multiple performance indicators appropriate for the industry under study, should be considered. It may well be that the advantage attributable to TQM may be appropriated across shareholders, which would then be reflected in both traditional and nontraditional measures of performance. This potential outcome should be tested using alternative measures of performance, as was done in this study. Therefore, it would be beneficial for future research to look at other industries in order to validate the above results in different settings.

Second, this study was cross-sectional. Although the model developed from the theory implied certain causal relationships, the causality could not be confirmed with our cross-sectional research design. A longitudinal study would be beneficial in order to confirm the directionality of the relationships identified in our results.

Third, the concept of total quality management is sufficiently diverse that it is difficult to comprehensively measure it (Steel & Jennings, 1992). We measured the concept of teamwork indirectly as the

practice labeled "top management team involvement." However, some scholars have argued that teamwork throughout an entire organization is integral to the TQM philosophy (Hackman & Wageman, 1995). Thus, researchers conducting future studies of TQM may want to assess teamwork more explicitly and throughout entire organizations to make this TQM implementation measure more robust.

Finally, the scales used to measure structural control and exploration should be considered exploratory, given their modest reliability coefficients and small number of items. In future studies using these scales, use of additional items dealing with structural controls and exploratory mechanisms would increase the reliability of these two constructs.

Conclusions

Despite the limitations discussed above, the study provides several important contributions to the literature. Notably, it clarifies the relationship between the degree of implementation of TQM practices and organizational performance and tentatively identifies complementary variables whose synergistic effect enhances this relationship. The study findings provide relatively robust support for the aggressive adoption of TQM in its entirety. As Hackman and Wageman (1995) suggested, total quality management, properly implemented and combined with the appropriate organizational variables, may be a vehicle that allows organizations to dynamically maintain a fit with their environments in a competitive and sustainable fashion.

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APPENDIX
Questionnaire Items

TQM Practices

For the seven TQM practices, respondents indicated the extent to which the items represented practices in their organizations. (1 = "very low" to 5 = "very high")

1. Top Management Team Involvement
   The top health care organization executive assumes responsibility for quality performance.
   The major department heads participate in the quality improvement process.
   The organization's top management (top administrator and major department heads) has objectives for quality performance.
   The goal-setting process for quality within the health care organization is comprehensive.
   Importance is attached to quality by the organization's top management in relation to cost objectives.
   Quality issues are reviewed in the organization's top management meetings.
2. Quality Philosophy
   There is a strong commitment to quality at all levels of this organization.
   People in this organization are aware of its overall mission.
   Members of this organization show concern for the need for quality.
   Continuous quality improvement is an important goal of this organization.
   Managers here try to plan ahead for changes that might affect our performance.
3. Emphasis on TQM-Oriented Training
   Quality-related training is given to hourly employees throughout the organization.
   Quality-related training is given to managers and supervisors throughout the organization.
   Training is given in the "total quality concept" (i.e., philosophy of company-wide responsibility for quality) throughout the organization.
   Training is given in the basic statistical techniques (such as histograms and control charts) in the organization as a whole.
   The organization's top management is committed to employee training for quality.
   Resources are provided for employee training in quality.
4. Customer Driven
   Associates know who their customers are.
   Associates attempt to measure their *internal* customers' needs (customers inside this organization).
   Associates attempt to measure their *external* customers' needs (customers outside this organization).
   The organization uses customer requirements as the basis for quality.
   Our organization is more customer-focused than out competitors.
5. Continuous Improvement
   Associates in the organization try to improve the quality of their service.
   Associates in the organization believe that quality improvement is their responsibility.
   Associates in the organization analyze their work products to look for ways of doing a better job.
6. Management by Fact
   Quality data (defects, complaints, outcomes, time, satisfaction, etc.) are available.
   Quality data are timely.
   Quality data are used as tools to manage quality.
   Quality data are available to hourly workers.
   Quality data are available to managers and super-

visors.

Quality data are used to evaluate supervisor and managerial performance.

7. Total Quality Methods

Associates use the basic statistical techniques (such as histograms and control charts) to study their work processes.

Associates analyze the time it takes to get the job done.

Associates keep records and charts measuring the quality of work displayed in their work area.

Statistical techniques are used to reduce variation in processes in the organization.

TQM procedures (such as brainstorming, cause-and-effect diagrams, Pareto charts) are used to analyze information for process improvement.

Perceived Financial Performance

The scale represents the organization's performance relative to competitors' over the last three years. (1 = "much worse," to 5 = "much better")

Growth in earnings
Growth in revenue
Changes in market share
Return on assets
Long-run level of profitability

Structural Exploration and Control

For the structural exploration and structural control items, a respondent was asked to identify the operating management philosophy actually used in her or his health care organization. A 1 represented the first statement in each pair, and a 7 represented the second statement, with 4 as the midpoint standing for a combination of the two.

Structural Exploration

Highly structured channels of communication and highly restricted access to important financial and operating information/Open channels of communication with important financial and operating information flowing quite freely throughout the organization.

A strong emphasis on holding fast to true and tried management principles despite any changes in business conditions/A strong emphasis on adapting freely to changing circumstances without too much concern for past practices.

Structural Control

Strong emphasis on always getting personnel to follow the formally laid down procedures/Strong emphasis on getting things done even if this means disregarding formal procedures.

Tight formal control of most operations by means of sophisticated control and information systems/Loose, informal control; heavy dependence on informal relationships and norm of cooperation for getting work done.

Strong emphasis on getting line and staff personnel to adhere closely to formal job descriptions/Strong tendency to let requirements of the situation and the individual's personality define proper on-job behavior.

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