A Framework for Organizational Quality Culture

KIM CAMERON, CASE WESTERN RESERVE UNIVERSITY
WESLEY SINE, CORNELL UNIVERSITY

This paper introduces a framework for organizational quality culture, which is needed because of the lack of success associated with various types of quality initiatives and their confusing relationship with effectiveness. Despite the fact that quality has received a great deal of attention in the organizational studies literature, lack of clarity is still typical of the concept. Multiple definitions of quality are prevalent, lack of agreement exists regarding key dimensions, and the relationship between quality and organizational performance remains ambiguous (Ernst and Young, and the American Quality Foundation 1992; Fuchs 1996; Grandzol and Gershon 1997).

This paper identifies a framework for organizational quality culture, and examines the framework's legitimacy with empirical analyses. It represents how people define and reflect quality through their actions, decisions, and attitudes. The key objective is to make the concept of quality culture accessible to organizational scholars and to those charged with managing or enhancing organizational quality.

Key words: creative quality, customer focus, effectiveness, error detection and prevention, quality emphasis, TQM

DEFINITIONS

Definitions of quality vary quite widely (Greene 1993; Cole 1999a). Table 1, for example, lists seven common definitions of quality appearing in the literature. The first five focus on quality as an attribute of a product or service, or on specific tools, techniques, or activities in an organization. These definitions are consistent with Juran's (1989, 1992) "little q" approach to quality. The last two definitions focus on quality as the overall functioning of an organization or an ultimate outcome (that is, consistent with Juran's "Big Q" approach to quality). The term *total quality management* (TQM) is generally used synonymously with "Big Q" quality, and it is the concept appearing most frequently in the organizational studies literature.

KEY DIMENSIONS

Although a significant amount of attention has been given to identifying the key dimensions of TQM in the literature, agreement still has not been reached. For example, Westphal, Gulati, and Shortell (1997) claim TQM consists of four key quality dimensions: (1) customer focus, (2) continuous improvement, (3) structured problem-solving processes, and (4) employee empowerment. Hackman and Wageman (1995) propose customer focus, teamwork, supplier partnerships, process management, and use of statistical and scientific tools as the core dimensions. Garvin (1988) and Teboul (1991) each identify seven dimensions: (1) quality as a competitive priority, (2) customer focus, (3) quality deployment, (4) quality incentives, (5) organizationwide commitment, (6) top management commitment, and (7) progressive workforce practices. The Malcolm Baldrige National Quality Award claims to include a comprehensive set of dimensions; namely,

leadership as a driver of quality, information gathering and analysis, quality planning, quality assurance, and human resource management as process dimensions, and customer satisfaction and quality results as outcome dimensions. Greene (1993) reviewed quality practices in Japan and the United States and claims to have identified the comprehensive set of 24 TQM dimensions. Less than 20 percent overlap occurs among these various authors' key dimensions of quality, and it is clear that a lack of unanimity exists regarding the key dimensions of quality in the organizational studies literature.

QUALITY AND EFFECTIVENESS

In light of this inconsistency, it is not surprising that the relationship between TQM and organizational effectiveness also remains ambiguous. Some evidence

suggests that TQM enhances effectiveness, other evidence suggests the reverse. For example, quality circles, certain organizational structures and processes, "lean" manufacturing techniques, and particular quality control procedures have been found to be associated with improved product quality, productivity, morale, and efficiency (Garvin 1988; Flynn, Schroeder, and Sakakibara 1995). Well-known surveys by the General Accounting Office (1991), the Profit Impacts on Marketing Strategies (PIMS) (Buzzell and Weirseman 1981; Buzzell and Gale 1987), the Delta Consulting Group (1993), and the National Institute of Standards and Technology (1997) have found positive relationships between quality and organizational performance (including employee-related indicators, operating indicators, customer indicators, and financial indicators). Hendricks and Singhal (1997a) studied winners of quality awards, and Easton and Jarrell (1998) analyzed

Table 1 Seven major definitions of quality.

Approach	Definition	Example
Transcendent	"Quality is neither mind nor matter, but a third entity independent of the two. even though Quality cannot be defined, you know what it is" (Pirsig 1974).	Innate excellence
		Timeless beauty
		Universal appeal
Product-based	"Quality refers to the amounts of the unpriced attributes contained in each unit of the priced attribute" (Leffler 1982).	Durability
		Extra desired attributes
		Wanted features
User-based	"Quality is fitness for use" (Juran 1974). "Quality consists of the capacity to satisfy wants" (Edwards 1968).	Satisfies customers
		Fulfills expectations
		Meets needs
Production-based	"Quality means conformance to requirements" (Crosby 1979).	Reliability
		Adherence to specifications
		Variation within tolerance limits
Value-based	"Quality means best for certain conditions... (a) the actual use and (b) the selling price" (Feigenbaum 1983).	Performance at an acceptable price
		Affordable excellence
		Value for the money spent
System-based	"[Quality is] a system of means to economically produce goods or services which satisfy customers' requirements" (Japanese Industrial Standards Committee Z8101 1981, 14).	Utilizing accepted quality procedures
		Integrated approach
		Quality processes
Cultural	"[Quality] means that the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training" (Sashkin and Kiser 1993).	Management philosophy
		Lifestyle
		Mind-set

©1999, ASQ

Sources: Cameron and Whetten (1996); Garvin (1988).

44 corporations and concluded that successful implementation of TQM programs positively influenced firm economic performance.

On the other hand, surveys across several countries have reported that most quality initiatives fail to achieve their objectives (Ernst and Young, and the American Quality Foundation 1992). A great many firms have labeled TQM a failure and are actually cutting their quality budgets. (Kelly 1992; Fuchsberg 1992; "The cracks in quality" 1992; "The straining of quality" 1995). Larcker and Ittner (1997) report that only 29 percent of managers could link quality initiatives to accounting returns such as ROA and ROI, and only 12 percent could link quality initiatives to stock price returns. Powell's (1995) survey of the organizational studies literature on TQM led him to conclude that most organizational features commonly associated with quality programs do not yield significant performance benefits to organizations. Westphal, Gulati, and Shortell (1997) found that the main effect of TQM programs on health care organizations was an enhancement of legitimacy in the industry, not enhanced operational outcomes.

TQM RESEARCH

Unfortunately, a noticeable characteristic of the scholarly literature on TQM is the dearth of empirical investigations. In a review of TQM literature up to 1995, Peterson and Cameron (1995) found that only 3 percent of the published articles were empirical studies, 59 percent were commentaries or editorials about TQM's merits or attributes, and 36 percent were case study descriptions of TQM's application in a single organization or setting. Reviews of the TQM literature by Haim (1993) and Hendricks and Singhal (1997a, 1261) found that only two studies of the 20 being reviewed "use rigorous research methods to estimate the financial impact of TQM."

The point is, conflicting findings exist that characterize quality initiatives as both successes and as failures. Yet, empirical evidence is lacking regarding why some quality programs exhibit a dramatic positive effect while others result in either no improvement or an actual decline in organizational performance. Definitions, dimensions, and impacts of quality programs remain inconclusive.

QUALITY CULTURE

To overcome these liabilities of inconsistent definitions, dimensions, and performance impacts, some scholars have begun to investigate TQM as a cultural phenomenon (see Table 1) rather than as a set of tools and techniques (Westphal, Gulati, and Shortell 1997; Powell 1995; Cameron 1995). As this shift has occurred, more consistency in outcomes has begun to emerge (Reed, Lemak, and Montgomery 1996; Easton and Jarrell 1998; Hendricks and Singhal 1997a, 1997b, 1998). For example, Cameron and Quinn (1999) reported on evidence that successful TQM implementation was dependent on quality being embedded in and reflected by the culture of the organization. Unless the organization's culture was congruent with the quality initiative, positive outcomes were less likely.

Treating quality as a cultural phenomenon means that quality is approached as a set of values, as a general orientation, and an organizational ideology rather than as a set of tools or techniques. George Bush (National Institute of Standards and Technology 1992), when announcing the formation of the Baldrige Award, represented this perspective in identifying quality as "not just a strategy. It is a new style of working, even a new style of thinking. It is a way of life." Thus, when quality is defined culturally, investigators are able to avoid debates about which dimensions or processes are the most important to consider. Instead, the focus of attention shifts to the effects of an organization's values, attitudes, and expectations reflecting its quality principles.

A rich literature exists on the topic of organizational culture, and definitions and dimensions of culture also are unsurprisingly diverse (for example, Schein 1985; Cameron and Ettington 1988; Trice and Beyer, 1993). Rather than to review that literature here, it is sufficient to define culture as "the taken-for-granted values, underlying assumptions and expectations, collective memories, and definitions present in the organization.

It represents "how things are around here" (Cameron and Quinn 1999, 14). Therefore, the quality culture of an organization is a subset of an organization's overall culture. It reflects the general approach, the values, and the orientation toward quality that permeate organizational actions. The key advantage of treating quality as a cultural variable is that the ambiguity and inconsistency associated with the multiple definitions and dimensions of TQM diminish.

A FRAMEWORK FOR QUALITY CULTURE

Cole (1999a) attributed the development of quality as a cultural attribute to the Japanese. Beginning in 1955 and developing through the 1980s, Japanese quality took on the characteristics of a belief system rather than merely a set of tools and techniques. American attempts to duplicate Japanese quality coupled with low costs often failed because tools and techniques were imported without the accompanying cultural shift. Cole identified two main quality cultures that typify manufacturing organizations: a "new quality paradigm" and an "old quality paradigm." Key attributes of those two cultures are summarized in Table 2 (Cole 1999b).

Garvin (1988) was among the first to point out that quality cultures, eras, or paradigms have developed over time in organizations. He identified shifts in the values and ideologies—the cultures—of organizations with respect to their quality orientations. He labeled four major quality cultures as an "inspection culture," a "statistical control culture," a "quality assurance culture," and a "strategic quality management culture," each of which is summarized in Table 2.

Informed by these and other authors' frameworks of quality (for example, Dean and Evans 1994; Handfield and Ghosh 1994) interviews were conducted with senior executives in more than 100 manufacturing and service organizations over a six year period, 1988–1994. These interviews occurred in the context of several different studies (Cameron, Freeman, and Mishra 1993; Barnett 1994; Peterson and Cameron 1995) in which quality was a variable. In each case, the interviews were conducted by at least two researchers

while investigating organizational effectiveness, quality performance, downsizing, or organizational learning. Descriptions of the specific methodologies used in those studies is detailed elsewhere, but in each set of interviews questions were asked to gauge the nature of the quality culture in the organization. Identifiable quality cultures were detected in response to questions such as: How is quality defined in this organization? How does this organization achieve high quality outcomes? What happens when errors occur? How do you learn about and interact with customers or clients? How do you respond to competitors with higher quality products or services? How do you improve quality? What role do quality professionals play? The statements made in response to these questions were analyzed by the interviewers to form the four culture types.

Table 2 summarizes the attributes of the four types of quality cultures that were identified over this six-year period. A large majority of organizations (more than 80 percent) appeared to have a discernible orientation toward quality. Like Cole's (1999b) and Garvin's (1988) frameworks, the four cultures emerging from these interviews represent ideal types in the sense that not every single attribute listed was present in every organization typified by that culture. As can be seen in Table 2, however, a great deal of overlap occurs among the three different culture frameworks, supporting the notion that different quality cultures likely exist in organizations. A more detailed description of these types of quality cultures is presented in the next section as foundation for an empirical study investigating the framework's validity.

Absence of a Quality Emphasis

A few organizations were found that paid little or no heed to quality as a topic. Quality was neither an aspect of their corporate strategy nor a primary objective of the top management team. It was not the case that the quality of products or services was necessarily poor, but quality as a high priority or key target of the organization was not made explicit. Customer data collection was not a part of the assessment system nor were rewards and incentives tied in any way to customer satisfaction. For the most part, quality as a

Table 2 A framework of quality cultures.

Quality culture	Garvin (1988)	Cole (1999b)	Current framework
Absence of quality emphasis			*Regarding products* • Quality is not a priority. • Quality is not systematically measured. • Quality is not tied to the organizational strategy. *Regarding customers* • The organization is not focused on customers. • It is not receiving feedback from customers. • The organization is not responsive to customers.
Error detection	*Inspection and quality control eras* • Primary concerns are detection and control. • Quality is a problem. • Focus is on product uniformity. • Uses statistical tools and measurement. • Professionals troubleshoot and inspect. • The primary responsibility for quality is in manufacturing to "inspect in" or "control in" quality.	*Old paradigm* • Find and fix errors downstream. • Detection and repair are important. • Meets agreed-upon standards. • Conformance to requirements is important. • Quality is a functional specialty. • Match competitors. • Quality is carried out by experts.	*Regarding products* • Avoid mistakes. • Reduce waste, rework, and repair. • Detects problems. • Focus is on outputs. *Regarding customers* • Avoid annoying customers. • Respond to complaints efficiently and accurately. • Assess satisfaction after the fact. • Focus on needs and requirements.
Error prevention	*Quality assurance and strategic management eras* • Primary concerns are coordination, prevention, and competition. • Quality is to be attacked aggressively. • Quality is a strategic advantage. • All employees are responsible for quality. • Professionals plan, design, measure, train, and educate. • Quality is "built in" and "managed into" processes. • The emphasis is on customer and market needs.	*New paradigm* • The focus is on prevention. • Quality has goals, controls, and plans. • There is a corporatewide quality language. • There is a problem-solving methodology. • Quality is a corporate strategy. • Employees are involved. • There is cross-functional cooperation.	*Regarding products* • Expect zero defects. • Prevent errors and mistakes. • Hold everyone accountable. • Focus on processes and root causes. *Regarding customers* • Satisfy customers and exceed expectations. • Eliminate problems in advance. • Involve customers in design. • Focus on preferences or "nice-to-have" attributes.

Table 2 A framework of quality cultures. *(continued)*

Quality culture	Garvin (1988)	Cole (1999b)	Current framework
Creative quality		*New paradigm*	*Regarding products*
		• Internalize customer preferences.	• Constantly improve and escalate standards.
		• Anticipate customer needs.	• Concentrate on things-gone-right.
			• Emphasize breakthroughs.
			• Focus on improvement in suppliers, customers, and processes.
			Regarding customers
			• Expect lifelong loyalty.
			• Surprise and delight customers.
			• Anticipate expectations and create new preferences.

©1999, ASQ

topic was treated no differently than, say, training, R&D, or order entry. The dominant cultural values of the organization just did not include quality.

Error Detection Culture

Another type of quality culture was named *error detection culture*. Garvin (1988) used the labels "inspection culture" and a subsequent "statistical control culture" to describe the same phenomenon. In his inspection culture, quality was associated with detecting mistakes and errors in products and services and, in the statistical control culture, quality was associated with reducing errors and controlling variation through statistical procedures. Cole labeled this culture the "old paradigm." Organizations dominated by an error detection culture approached quality as a problem to be solved or as a set of potential obstacles to be avoided. With regard to products, these organizations tended to emphasize inspecting, in order to detect errors; avoiding mistakes; reducing waste; and finding and fixing defects. Auditors and inspectors examined and tested products and services after they were produced. The emphasis was on output uniformity and staying within specified tolerance limits. Quality professionals in these organizations focused on counting, measuring, and auditing.

With regard to customer orientation, a major focus was on avoiding dissatisfaction or irritation among internal and external customers in product and service delivery. The orientation was toward addressing customer complaints quickly and accurately in order to reduce the incidence of customer disapproval. The emphasis was on giving customers what they needed— that is, meeting demands and requirements. The extent to which customer needs were met was assessed after the service had been provided.

Error Prevention Culture

A third quality culture type was named *error prevention culture*. This culture type approached quality as a problem to be tackled aggressively rather than reactively. Garvin (1988) identified this as a combination of the quality assurance culture and the strategic quality management culture. He pointed out that quality techniques and philosophies were expanded beyond the production of outputs to "total quality control." Top management took responsibility for ensuring quality in all parts of the organization (Feigenbaum 1983). This culture type represents a change in general orientation toward proactivity instead of reactivity and toward avoiding mistakes instead of correcting them after-the-fact. Cole's new paradigm is similar to this culture type.

Regarding products, organizations with this culture type focused on achieving zero defects (perfection) by doing work right the first time, and by emphasizing root (common) causes of problems instead of treating symptoms or special (unique) causes of problems. All workers were assumed to be accountable for quality, not

just end-of-the-line inspectors or the manufacturing function. Organizational design and measurement systems concentrated on processes more than on outputs. Quality professionals in these firms emphasized planning, program design, and process mapping.

...organizational factors such as learning activities, quality tools and techniques, and people management strategies had more predictive power than the behavior or attributes of the organization's leader.

With regard to the customer orientation, the approach of managers was to please and satisfy customers, not just avoid annoyances. It was to provide value-added services that created customer trust and satisfaction. Customer expectations were sometimes exceeded, not just met. Customer preferences (not just requirements) were obtained in advance of product and service design and delivery, and customer satisfaction was monitored continually after the service was provided. Customers were defined as partners so that customer training occurred in order that expectations could more closely match company capability. Customers were often involved in the design of the organization's products and services.

Creative Quality Culture

The fourth quality culture type was named the creative quality culture. Garvin (1988) and Cole (1999a) identified a few of these attributes, but this culture type is largely unique from these authors' frameworks. In this culture the organization's entire strategy becomes centered on quality. The business strategy and the quality strategy are inseparable. In addition, quality itself has a new definition as well. Regarding products, continuous improvement (small, incremental changes) was coupled with innovation (large, breakthrough changes) in the pursuit of better outputs. Constantly rising standards of performance as well as levels of performance were key objectives. A focus was on designing, producing, and measuring "things-gone-right" in addition to avoiding "things-gone-wrong." Products were not only designed to be produced defect free, but they were designed in order to achieve additional, unexpected benefits (for example, recyclable, user-friendly, less costly, safer). Quality professionals in these organizations emphasized education, training, coaching, and system design. Helping to improve suppliers' and customers' quality became as important as improving the firm's own work processes and outcomes.

Regarding customer orientation, the focus was on generating lifelong loyalty among customers by creating new levels of performance that no other organization addressed. This was achieved by surprising and delighting customers, solving problems that customers didn't expect anyone to solve, and engaging in extra-mile restitution when aberrations or mistakes occurred. Customer expectations were anticipated before being verbalized, and customer excitement and commitment replaced customer satisfaction as the primary goal.

These different types of quality cultures might be considered to represent different levels of quality maturity. In general, an absence of quality emphasis is less advanced than an error detection culture, which represents a less advanced quality culture than error prevention. In turn, the creative quality culture seems to be the most advanced culture (Garvin 1988; Cole 1993; Handfield and Ghosh 1994; Hendricks and Singhal 1997a).

PREVIOUS RESEARCH

Previous research on the topic of organizational downsizing investigated the relationship between these quality culture types and the success of downsizing (Cameron 1992; Cameron, Freeman, and Mishra 1993; Cameron 1995). The four quality culture types were measured empirically in 91 manufacturing and service organizations. It was found that the more advanced the quality culture, the more successful was performance after downsizing. High performance was indicated by product defect levels, financial performance over five years, customer satisfaction, and managerial ratings of organizational effectiveness. Downsizing organizations dominated by a creative quality culture scored highest on all these outcome measures, and organizations with an error prevention culture scored next highest. These

results suggest that the quality culture of an organization, at least under conditions of downsizing, have a positive relationship to its performance.

AN EMPIRICAL EXAMINATION OF THE FRAMEWORK

To examine the legitimacy of this quality culture framework, an investigation was conducted to identify the extent to which different quality cultures are associated with different levels of organizational effectiveness, and the extent to which quality practices and tools are typical of different quality cultures. The two research questions investigated were

1. Are certain quality cultures associated with higher levels of organizational effectiveness?
2. What quality tools, processes, and practices are associated with the different quality cultures? Do different cultures reflect different quality techniques?

Sample

On a monthly basis over a period of three years—1990, 1991, and 1992—upper mid-level managers from 68 organizations completed a 113-item survey assessing quality culture, organizational effectiveness, and the process and practices associated with quality. These respondents were participants in a weeklong executive program focused on improving quality and organizational effectiveness. The surveys were filled out at the beginning of the training program. The same managers did not respond to the survey in each month; instead a subsample of managers at the same hierarchical level in the corporation completed the survey over the three-year period. In 1990, 133 managers provided data; in 1991, 358 managers provided data; and in 1992, 444 managers provided data, for a total of 935 respondents. Functions represented by these managers included control, employee relations, engineering, finance, manufacturing, marketing, operations, production, purchasing, quality, research, and sales. No significant differences were found among the different respondent groups on a month-by-month

basis or in terms of function, personal demographics (for example, age, tenure, salary), or quality experience.

Because the level of analysis for this study was the organizational unit, the scores of respondents within the same organization were averaged together in order to compute a mean score for each of the 68 organizations. The reliability of respondents' ratings within each business unit ranged from 0.6 to 0.95. Two organizations with reliabilities less than 0.6 were dropped. The number of respondents per organization ranged from 5 to 72, and seven organizations with a response rate of less than five individuals were dropped from the analyses.

The 68 organizations were strategic business units and semi-autonomous businesses within a large, multinational corporation. The types of organizations included in the study were assembly, parts, distribution, European headquarters, land services, lighting, marketing, medical systems, new product development, retail sales, and stamping and casting businesses. Each of these organizations represents a business unit with full authority to establish strategy, implement quality procedures, make organizational changes, and hire and fire employees. Some of these units had a general reputation inside the corporation of performing well; others had a reputation of poor performance.

Unfortunately, whereas each business unit is independent in terms of strategy deployment, performance indicators such as profit and loss, productivity, and customer satisfaction are not compiled at this level in the corporation. Because the kinds of outputs produced by each of these units differ markedly (for example, products, reports, staff support, sales), only aggregated corporate measures are accumulated. Therefore, common objective performance indicators (for example, productivity, costs, errors) are unavailable at the business unit level, so perceptual data on outcomes were obtained from managers in each organization. The research instruments used to gather data from these organizations are available from the first author.

Survey Construction

A 119-item survey was developed to assess common practices, processes, and tools relating to quality, as well as quality and organizational effectiveness.

Examples of the quality-related variables included leadership commitment to quality; communications focused on quality; gathering and using information on employees, customers, competitors, and quality outcomes; type of measurement system used; involvement of employees and customers in quality planning and improvement; use of SPC, QFD, DOE, suggestion systems, and other standard quality tools; the priority placed on quality; rewards and recognition for achieving quality and customer satisfaction; evidence of waste, excess, time lines, and reliability; and so forth. The questions used to measure quality culture had been developed, pretested, and used in previous studies (Cameron, Freeman, and Mishra 1993; Cameron 1995). A copy of the research instrument and a complete listing of variables is available from the first author. It should be noted that the Malcolm Baldrige National Quality Award criteria change slightly each year, including the labels used to describe each of the seven dimensions. The 1997 dimension names, for example, were changed quite substantially compared to the dimension names used in the Baldrige Award process from 1988 through 1995. The questionnaire items in this study utilized the 1995 Baldrige Award labels and criteria.

Quality Culture

To assess quality culture, the survey instrument was designed to uncover the underlying orientations of organization members toward quality. Descriptive scenarios were developed that described the value orientation, philosophy, and approach to work processes, outputs, and customers that characterized each different quality culture. Respondents were asked to divide 100 points among four scenarios based on the extent to which each scenario was similar to the respondent's own organization. A scenario that was most similar to the respondent's own organization was assigned the most points, and fewer points were assigned to scenarios that were less similar. Scenarios that received the highest number of points reflected the dominant quality culture in the organization, although each organization was expected to have some emphasis on more than one culture type.

Scenarios used to elicit responses to quality cultures included the following:

- We haven't thought much about our approach to quality. Not much has changed from past practice. We do things about the same as we have always done them. (Absence of quality emphasis)
- We focus on finding our mistakes and correcting them accurately and efficiently. We place an emphasis on inspecting and auditing our work for defects. We try to avoid antagonizing our customers, so we focus on meeting their needs and responding quickly to their complaints. (Error detection)
- We focus on preventing mistakes before they occur by searching for root causes of problems. We place an emphasis on making sure that the processes we use are clearly mapped and well-functioning. We serve our customers by satisfying their preferences and sometimes exceeding requirements, and we try to do the job right the first time. (Error prevention)
- We focus on consistently exceeding the standards of performance expected of us. We place emphasis on surprising and delighting our customers by going beyond what they would request. We focus on continuous improvement in everything we do, so that no current performance level is satisfactory. We are constantly pursuing breakthroughs in quality performance. (Creative quality)

Quality Practices, Processes, and Tools

Questions measuring organizational quality practices, processes, and activities were based on the 1995 Malcolm Baldrige National Quality Award application criteria. These criteria were claimed to be a comprehensive set of indicators of quality processes (Reimann 1988). On the survey instrument, 97 items were used to measure the following dimensions: leadership; information collection and analysis; information use; quality planning; the utilization of human resources in quality programs; quality assurance, the use of quality tools; customer satisfaction; alignment of organizational structure with quality processes and goals; and quality management (see Appendix 1). The rating scale

ranged from 6 "strongly agree" to 1 "strongly disagree." Correlations within the dimensions were high and items within each dimension were added together to create a single variable. (Cronbach alphas were greater than 0.70 for all dimensions except organizational structure which scored .620).

Organizational Effectiveness

Organizational effectiveness was assessed in three ways.

First, respondents compared various aspects of their organization's performance to four standards: the industry average, the performance of their best competitor, the level of expected performance by customers, and their own past performance. Ratings ranged from 6 "much higher" to 1 "much lower," and an average score was computed for each organization. The reliability coefficient among ratings of the four comparison standards is $r = .87$ during 1990–1992, suggesting that computing an average effectiveness score across the three-year period was appropriate. These ratings are different from the standard perceptual assessments of effectiveness. Generally, overall ratings of effectiveness are obtained based on generalized impressions of organization members (for example, see Cameron 1978). The reliability of such ratings is suspect, however, because no objective or external referent is present upon which to base the ratings. To overcome this difficulty, effectiveness ratings in this study were obtained by asking respondents to compare their own organization's performance to specific standards (for example, industry average, last year's performance), not merely general impressions. The ratings, therefore, are more likely to reflect reliable judgments than ratings without referents.

Second, organizational effectiveness was assessed by having respondents report several specific results of organizational performance—that is, the amount of rework, missed deadlines, waste, excess, grievances and employee complaints, absenteeism, customer complaints, levels of customer satisfaction, speed of new product introduction, customer loyalty, and consistency and reliability of performance. Again, the rating scale ranged from 6 "strongly agree" to 1 "strongly disagree." Scores on these various results variables during 1990–1992 were averaged together so that each organization was given a single results score. Such averaging was appropriate inasmuch as the reliability coefficient among these various measures of results is .83.

The third method for assessing organizational effectiveness was to obtain the rank orderings of six knowledgeable, external (unattached), corporate-level executives in the parent company who were familiar with the general performance of all the organizations in this study. Each of these executives ranked the businesses from high to low depending on their evaluation of the effectiveness of each organization. Therefore, organizations were arrayed on the basis of the average ranking received by these outsiders. The purpose for collecting these external executive rankings was to provide a method for calibrating the validity of the organization members' ratings (Barnett 1994).
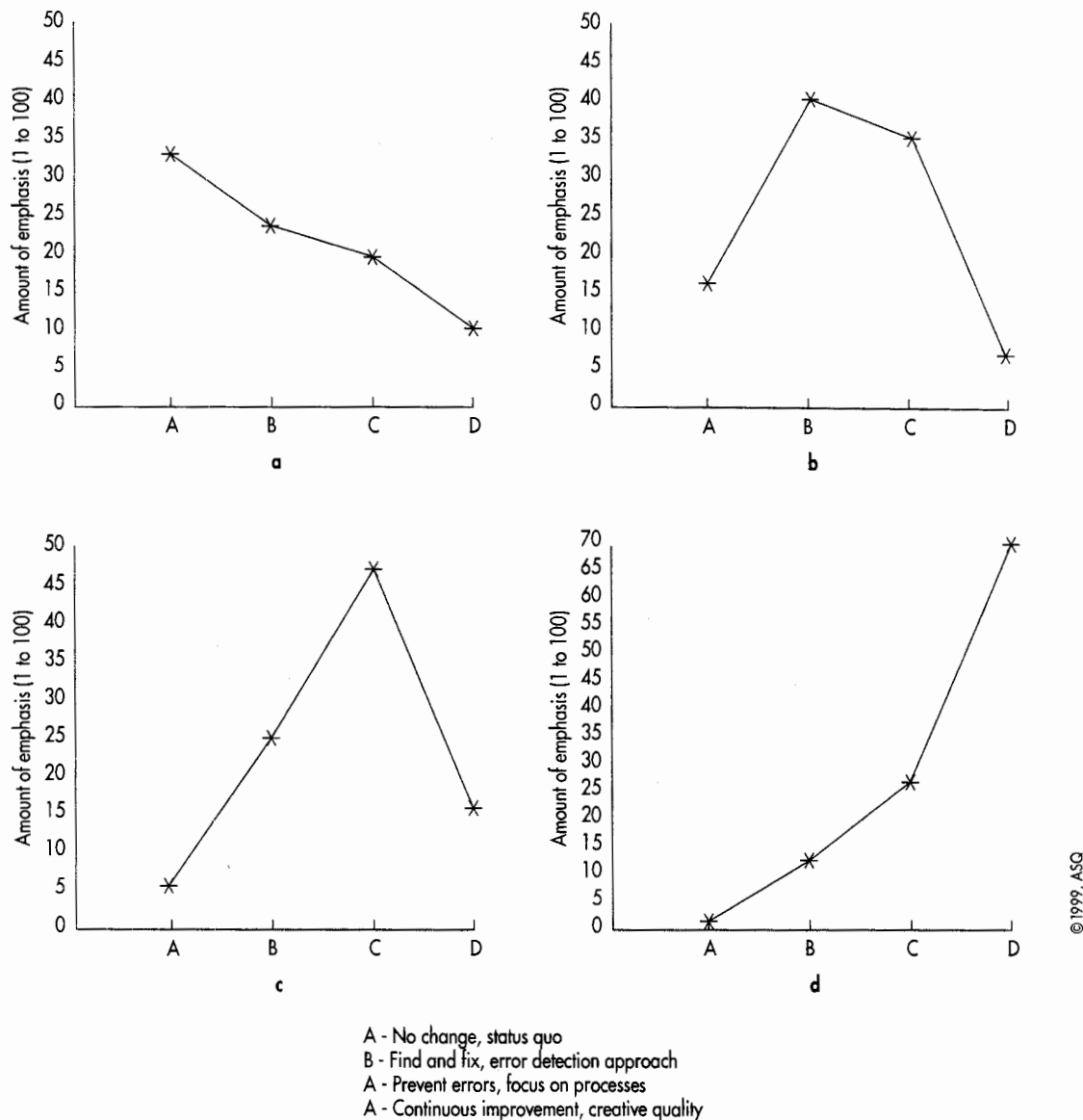
Organizations were ranked-ordered on the basis of the scores they received on these three types of effectiveness ratings—(1) comparisons with the industry average, the performance of the organization's best competitor, the level of expected performance by customers, and the organization's own past performance; (2) reports of performance results by organization members; and (3) external executive rankings of performance. The average Spearman rank-order correlation among these sets of rankings is .58 ($p < .001$), suggesting a reasonable degree of consistency between the ratings of internal respondents and the ratings of independent external executives.

An overall effectiveness score was computed by averaging the scores of the first two measures of effectiveness (that is, the results of organizational performance and the performance relative to the industry standard). The reliability score for these two measurements was 0.85.

ANALYSES

Quality culture plots were generated for each organization in the sample by averaging across the ratings of quality culture produced by members of each organization. Figure 1 provides an example of four different quality culture plots resulting from the sample of 68 organizations. In plot a, for example, the organization is dominated by an absence of quality emphasis—

Figure 1 Four examples of quality culture profiles in the sample.

A - No change, status quo
B - Find and fix, error detection approach
A - Prevent errors, focus on processes
A - Continuous improvement, creative quality

little attention being paid to quality. Plot *b* shows an organization dominated by the error detection culture; plot *c* shows an organization dominated by an error prevention culture; and plot *d* shows an organization dominated by the creative quality culture. Culture plots were generated for each organization over each of the three years. No organization's dominant quality culture changed from one type to another between the beginning of 1990 and the end of 1992. That is, quality culture plots for each organization remained stable over the three-year period.

After computing a quality culture plot for each organization, the dominant culture type was identified for each unit. If equal numbers of points were given to two different quality cultures, the organization was classified by the more advanced culture type. This study employed an ordered logit regression to test the relationship between quality culture and the overall performance of the organization (research question 1). Ordered logit regression makes the assumption that a hierarchical ordering exists among quality cultures. The second research question was empirically investigated

using discriminant analysis to explore differences in quality practices and procedures among the four quality cultures. The quality processes and practices assessed on the survey were used as predictors to identify differences among quality cultures (research question 2).

In sum, data were gathered from 935 upper-middle managers representing 68 organizations by means of a survey instrument. The questionnaire items were reduced to 12 computed variables to investigate the relationship between four quality culture types and organizational performance as well as common quality processes and practices.

RESULTS
Effectiveness and Quality Culture

The first research question focuses on the relationship between quality culture and organizational effectiveness. Of interest was the extent to which advanced quality cultures are associated with higher levels of organizational effectiveness. The ordered logit analyses treated quality culture as the dependent variable and effectiveness as the independent variable. The purpose of running logit regression was to identify the strength, direction, and significance of the relationship between these two variables. The strong and significant coefficient indicates that higher levels of effectiveness are associated with more advanced levels of quality culture. An insignificant coefficient can be interpreted to mean that there is no difference between quality cultures. (Logit regression is an appropriate statistical test inasmuch as quality culture type is not measured as a continuous variable.)

Certain factors that may influence the quality culture of an organization were also analyzed as control variables. For example, some investigators have suggested that national culture may influence approaches to quality and the basic quality values of managers (Khurana 1994; Harzing and Hofstede 1996). Dummy variables were created for organizations based outside the United States and used to control for the influence of national culture. Other investigators have argued that the type of organization, or the functional focus of the organization, may influence quality paradigms (Trice and Beyer 1993; Barley 1983). For example, quality programs were originally implemented in manufacturing environments, and traditional TQM rhetoric is generally reflective of the activities of goods-producing organizations. Thus, because quality programs have simply been around longer in manufacturing organizations, quality cultures may be more advanced than in service-type organizations. Therefore, dummy variables were constructed to differentiate organizations by their main functional type (for example, manufacturing, support, R&D, sales). Table 3 reports these results.

These analyses suggest that more advanced levels of quality culture are, indeed, associated with higher levels of organizational effectiveness. An error detection culture, for example, is associated with lower levels of organizational effectiveness than an error prevention culture, and a creative quality culture is associated with the highest levels of organizational effectiveness. National culture has no significant impact on these results in that organizations based outside the United States were no more or less advanced in quality culture than organizations based inside the United States. However, organizations that focus primarily on support

Table 3 Relationship between quality culture and effectiveness (logit regression).				
Variable	β Coefficient	Standard error	Z score	Significance
Organizational effectiveness*	2.09	.837	2.501	.012
International	.005	1.15	.004	.997
Support*	−2.73	1.23	−2.22	.027
R&D	.862	1.46	.589	.556
Sales	.049	1.78	.027	.978
	Chi² 19.31	Probability 0.0037	Pseudo R² 0.227	Log likelihood −32.8

* $P < .05$

©1999, ASQ

functions (that is, accounting, regulation, legal services, finance), are less likely to adopt more advanced quality cultures. Research and development organizations and sales organizations, on the other hand, were not significantly different in their quality culture than manufacturing organizations.

Discriminating Among Quality Cultures

The second research question investigates the quality practices and procedures that differentiate among the four types of quality cultures. Discriminant analyses were conducted to identify which processes and tools were associated with which quality culture type. Table 4 reports the results.

The first discriminant function contains variables that, in combination, focus on organizational learning. It differentiates the two least advanced quality cultures—absence of quality emphasis and error

detection—from the two highest cultures—error prevention and creative quality. Less advanced quality cultures scored lower on this dimension than more advanced cultures. The second discriminant function contains variables that, in combination, focus on managing the human resources of the organization. Organizations characterized by creative quality had significantly higher scores than the other three cultures on both functions. These two discriminant functions accounted for 92 percent of the variance.

Discriminant function 1 is characterized by variables associated with various types of organizational learning. It includes gathering, disseminating, and using information from competitors, customers, employees, and quality performance. In addition, the presence of systems that learn from customer feedback and that assure quality performance and customer satisfaction are also factors in this function. More advanced quality cultures display these characteristics to a greater extent than less advanced cultures. The culture labeled "absence of quality culture" scored

Table 4 Significant discriminators among quality culture types.

Function	Eigenvalue	Canonical correlation	%Variance	Chi^2	df	Significance
1	1.5	.78	53.3	97.1	33	.000
2	1.1	.73	39.1	49.1	20	.000

Variables (Number of items)	Function 1		Function 2	
	Coefficient	Correlation	Coefficient	Correlation
Information use (17)	.56	.42**+	1.98	−.31
Information and analysis (21)	1.25	.40**+	−1.91	−.10
Customer satisfaction (5)	.47	.37**+	.24	.13
Quality assurance (8)	.69	.23**+	.07	.18
Quality tools (10)	.19	.18*+	−.48	−.09
Coordination and feedback (6)	−.09	-.09	.31	.25**+
HR utilization (8)	−1.17	.10	.33	.19**+
Management priorities (15)	.22	.12	.13	.17**+

Culture type	Centroid	
	Function 1	Function 2
Absence	−4.97	1.21
Error detection	−0.45	−0.43
Error prevention	0.23	−0.37
Creative quality	1.31	3.20

* $P < .01$
** $P < .001$
+ Largest absolute correlation between each variable and any discriminant function

©1999, ASQ

dramatically lower on this function than the other three cultures, suggesting that an organization's ability to learn is a vital characteristic of more advanced quality cultures.

Discriminant function 2 is highly related to the management of people in the organization and explains 39 percent of the variance among the four cultures. Specifically, this function differentiates creative quality culture from the other three cultures. Absence of quality emphasis scored slightly higher on this dimension than error detection and error prevention cultures. These results suggest that organizations with a creative quality culture are more likely to focus on teamwork, communication, and coordination than other quality culture types, and employees' skills and abilities are better matched to the work they are assigned in these organizations. The management of human resources in harmony with quality principles is a priority.

Function 3 accounts for only 6 percent of the variance and does not play a significant role in differentiating cultures. Multiple classification analysis correctly categorizes 87 percent of the organizational cultures based on the first two discriminant functions.

As can be noted in Table 5, a key difference between creative quality culture organizations and the other three culture types is their ability to simultaneously emphasize organizational learning—for example, information gathering and analysis coupled with change and improvement based on information—and the humanistic management of people—for example, teamwork, cross-functional coordination, optimizing utilization of human potential. The less advanced the quality culture, the less likely it is that organizations gather and use information associated with quality, that common quality assurance procedures and quality tools are used (for example, ISO 9000), and that people management techniques rely on coordination, feedback, and teamwork. Advanced quality culture organizations in this study were more likely to be learning organizations that promoted quality improvement. Not only did they have better information gathering, analysis, and use in decision making, but they also were more likely to have quality assurance processes and leaders who made quality a priority and focused on improving customer satisfaction. Additional

analyses using territorial mapping demonstrated that the variables concerned specifically with gathering information on competitors, and using that information in day-to-day activities, were most powerful in differentiating creative quality culture from the other three less advanced cultures.

DISCUSSION

As noted, the intent of this paper was to introduce and test a framework explaining different types of quality culture. It has become clear that when quality programs or TQM interventions are introduced into organizations without an accompanying change in the

---

Table 5 Distinguishing characteristics of quality cultures.

Less-advanced quality cultures

- Lower levels of organizational effectiveness
- Less use of standard quality tools and techniques (for example, ISO 9000 processes)
- Less emphasis on gathering, analyzing, and utilizing data on customers, competitors, employees, and performance
- Less evidence of organizational learning
- Less cross-functional coordination
- Less teamwork among employees
- Less focus on optimally utilizing human resources
- Quality not a high management priority

More-advanced quality cultures

- Higher levels of organizational effectiveness
- Implementation of standard quality tools and techniques (for example, ISO 9000 processes)
- A great deal of attention to gathering, analyzing, and utilizing data on customers, competitors, employees, and performance
- Evidence of organizational learning
- Cross-functional coordination
- Teamwork among employees
- Emphasis on optimally utilizing human resources
- Quality a high management priority

Attributes unique to creative quality cultures

- Simultaneous emphasis on organizational learning (change), stability, and control (quality assurance tools)
- Involvement of everyone in the organization in quality improvement
- Alignment of the organizational structure with quality objectives
- Active use of human resource systems to support and reward quality processes, procedures, and accomplishments
- Modeling and mentoring of quality principles from the top leadership

© 1999, ASQ

culture of the organization, the failure rate is high (Larcker and Ittner 1997). Such interventions are frequently treated by employees and observers as one more faddish technique that will come and go (Abrahamson 1996). A change in the prevailing paradigm, or the quality culture of the organization, is required if TQM is to achieve its potential to significantly enhance organizational performance.

The framework introduced here identifies four types of quality cultures. These four types emerged from interviews and investigations of organizations over a six-year period, and are consistent with previous authors' representations of quality eras or quality paradigms (Garvin 1988; Cole 1999a). These four types of quality culture represent a continuum ranging from less advanced to more advanced approaches to quality. The absence of a quality emphasis is the least advanced culture type, followed by an error detection culture, then an error prevention culture, and finally a creative quality culture. One important finding that emerged from this study—relating to the first research question—is that organizations with more advanced quality cultures have significantly higher levels of organizational performance than organizations with less advanced cultures. This implies that explaining an organization's effectiveness is at least partly dependent on knowing something about its most fundamental culture—that is, basic values, orientations, and definitions. Regardless of the quality programs and initiatives being pursued, these results suggest that an organization's performance is related in a significant way to its underlying quality culture. Quality improvement techniques may be less likely to affect performance if the organization's quality culture is not congruent and supportive of them.

Another important finding from this investigation—relating to the second research question—is that each different quality culture is characterized by a unique set of quality tools and techniques. This suggests that certain quality practices are more likely to be utilized when the organization's quality culture is more advanced. In particular, information management and human resources play more central roles in organizations with advanced quality cultures compared to those with less advanced cultures.

IMPLICATIONS

Several implications of these findings are worth mentioning briefly.

First, relatively few organizations have developed a quality culture characterized by creative quality. Defining quality as the pursuit of solving unidentified problems, surprising and delighting customers so that loyalty instead of satisfaction is the goal, and coupling breakthrough change with tight organizational control are characteristics of creative quality cultures that are not present in most organizations. In this investigation, the modal culture types were error detection followed by error prevention. Hence, individuals charged with leading or implementing quality improvement efforts may consider working first on the culture of the organization before launching a program limited in scope to quality tools and techniques.

Second, advanced quality cultures are fraught with paradox. At the same time that highly effective organizations emphasized organizational change, they also emphasized stability and control. Organizational learning was coupled with quality assurance and predictability (see Table 4). Authors in the past have pointed out that paradox is an essential component of organizational effectiveness (Peters and Waterman 1982; Cameron 1986; Quinn and Cameron 1988), and the same appears to be true of organizations with advanced quality cultures. Whereas consistency and predictability may be desirable, high levels of organizational performance—and quality—appear to be associated with the simultaneous pursuit of change and convention, surprise and stability, goal direction and adaptability, external focus and internal focus, learning and implementation. Organizations with the most advanced quality culture were not only the highest performers, but they also were characterized by the most paradox.

Third, it appears that culture more than leadership is the key to successful organizational performance. Whereas it is currently popular in the literature to highlight leadership as the key to organizational effectiveness, leadership factors did not emerge in this study as major predictors of performance. Nor did any particular leadership style or attribute distinguish the

different quality cultures. Instead, organizational factors such as learning activities, quality tools and techniques, and people management strategies had more predictive power than the behavior or attributes of the organization's leader. Whereas leadership cannot be ignored, the cultural definitions and values embedded in an organization's approach to quality may take priority as a predictor of success.

Fourth, whereas no evidence was found of organizations shifting over time from one quality culture to another in this study, it seems logical that such advancement is possible. Changes in organizational culture are slow and difficult (Denison 1989; Trice and Beyer 1993), but evidence exists that some organizations have made dramatic changes in organizational culture over time (Cameron and Quinn 1999). Shifts in quality culture seem to be both desirable and possible (Cole 1999b), and one important challenge of leaders in organizations is to manage the cultural change process. Moving from an error detection culture to an error prevention culture, for example, may produce a larger improvement in quality outcomes and organizational effectiveness than any number of individual change techniques. The exact process by which such advancement may occur is also a fruitful area for additional organizational research.

In sum, the advantage of treating quality as a cultural concept is that it deflects attention from the controversial and confusing results that have been produced in the quality research to date. Because quality and TQM remain so technique-oriented, controversy and ambiguity have continued to plague research findings, and the practical application of quality improvement processes seems to be going the way of other management fads. Hackman and Wageman (1995) gloomily predicted that TQM will have little impact on organizational performance in the future. They purport that TQM is a late-1980s phenomenon that has seen better days. On the other hand, shifting focus to the cultural nature of quality may help refocus attention on the phenomenon that Frederick W. Taylor (1912, 1340) associated with the success of "scientific management."

Scientific management is not any efficiency device, not a device of any kind for securing efficiency; nor is it any bunch or group of efficiency devices. It is not a new system for figuring costs; it is not a new scheme of paying men; it is not a piecework system; it is not a bonus system; it is not a premium system; it is no scheme for paying men; it is not holding a stop watch on a man and writing things down about him; it is not time study; it is not motion study nor an analysis of the movement of men and saying, 'Here is your system; go use it.' Now, in its essence, scientific management involves a complete mental revolution on the part of the working man engaged in any particular establishment or industry...without this complete mental revolution on both sides (workers and managers), scientific management does not exist. That is the essence of scientific management, this great revolution. ...

The future impact of quality on organizational performance may depend, like that of scientific management, on its being investigated as a cultural variable instead of merely as a set of techniques or dimensions. This framework is intended to assist in that process.

APPENDIX 1: SURVEY CONSTRUCTION

Construct	Number of items	Reliability
Culture	4	Not applicable
Leadership	5	.817
Information and analysis	24	.856
Information use	12	.893
Quality planning	6	.893
Human resource utilization	12	.899
Quality assurance	10	.875
Customer satisfaction	6	.780
Management priorities	7	.700

Organizational structure	4	.620
Quality tools	11	.898
Quality results		
Overall quality effectiveness	10	.870
Results	12	.830

APPENDIX 2: METHODS

Canonical correlation Association between the discriminant scores and those groups (cultures) being discriminated.

Chi square Tests whether or not the coefficients for all of the terms in the current model except the constant are equal to 0. Wilk's lambda chi square is reported as a method for testing whether or not there is a significant difference between the means (centroids) of the discriminant scores for each culture or whether the means of the four cultures are the same. This test answers the question whether or not a particular discriminant function adequately differentiates between groups (cultures).

Correlation Measures the strength and direction of the relationship between the independent variable and the discriminant function. The value ranges from -1 to 1. A higher score indicates a stronger relationship. In this study, the meaning of the discriminant function is determined based on those variables to which it was most highly correlated.

Discriminant analysis Discriminant analysis is used to build a predictive model of group membership based on observed characteristics. The analysis generates a set of discriminant functions based on linear combinations of the predictor (independent) variables that provide the best differentiation between the groups. In this case, the analysis is used to discover which quality processes, practices, and tools differentiate high-quality cultures from less-developed quality cultures.

Discriminant coefficient The rate of change in the dependent variable (function) per unit change in the predictor variable.

Eigenvalue Ratio of the between group sum of squares to the within group sum of squares.

Logit coefficient The logit coefficient is related to the dependent variable based on the log odds ratio. For every unit increase of a specific independent variable, the effect on the dependent variable is equal to the natural log of the logit coefficient, increasing or decreasing the odds that a certain organization fits in the specified category (culture).

Ordered logit analysis Logit regressions are used to model dependent variables, which are not continuous, but categorical. Ordered logit analyses are used when the values of the dependent categorical variables are hierarchically related to one another. In this study, the authors assumed a hierarchical relationship between cultures and expected more advanced cultures to have stronger relationship to effectiveness than less advanced cultures.

Percent of variance The purpose of the discriminant functions is to explain the variance between groups (cultures) using a specified set of independent variables. The percent of variance reports the amount of variance between groups that a particular discriminant function explains.

Probability Reports the chi square probability that all of the coefficients in the model are equal to 0. A probability less than .05 is considered significant.

Reliability coefficients The reliability or internal consistency of scale variables was determined with a Cronbach alpha test. It is based on the average inter-item correlation and ranges from -1 to 1. Cronbach alphas were computed using SPSS for each of the scale items.

Significance The significance of the Wilk's lambda chi square merely reports the significance of the function's chi square score. If this score is below .05 the chi square is considered significant and the centroids are not equal. The discriminant coefficient test, based on the standard errors of the β coefficient, determines whether or not the size of the coefficient is significantly different than 0. A value less than or equal to .05 indicates significance.

REFERENCES

Abrahamson, Eric. 1996. Management fashion. *Academy of Management Review* 21, no. 2:254–285.

Barley, Stephen R. 1983. Semiotics and the study of occupational and organizational cultures. *Administrative Science Quarterly* 28, no. 3:393–413.

Barnett, Carole K. 1994. Organizational learning and continuous quality improvement in an automotive manufacturing organization. Doctoral diss., University of Michigan.

Buzzell, R. D., and F. D. Weirseman. 1981. Model changes in market share: A cross-sectional analysis. *Strategic Management Journal* 2, no. 1:27–42.

Buzzell, R. D., and B. T. Gale. 1987. *The PIMS principles: Linking strategy to performance.* New York: Free Press.

Cameron, Kim S. 1978. Measuring organizational effectiveness in institutions of higher learning. *Administrative Science Quarterly* 23:604–632.

Cameron, Kim S. 1986. Effectiveness as paradox. *Management Science* 32:539–553.

———. 1992. In what ways do organizations implement total quality? Paper presented at the Academy of Management Meetings, Los Vegas.

———. 1995. Downsizing, quality, and performonce. In *The fall and rise of the American quality movement*, edited by Robert E. Cole. Cambridge, Mass.: Oxford University Press.

Cameron, Kim S., and Deborah Ettington. 1988. The conceptual foundations of organizational culture. *Higher Education: Handbook of Theory and Research* 4:356–396.

Cameron, Kim S., Sorah J. Freeman, and Aneil K. Mishra. 1993. Downsizing and redesigning organizations. In *Organizational change and redesign*, edited by George P. Huber, and William H. Glick. New York: Oxford University Press.

Comeron, Kim S., and Robert E. Quinn. 1999. *Diagnosing and changing organizational culture.* Reading, Mass.: Addison Wesley Longman.

Cameron, K. S., and D. A. Whetten. 1996. Organizational effectiveness ond quality: The second generation. *Higher Education: Handbook of Theory and Research* 11:265–306.

Cole, Robert E. 1993. Learning from learning theory: Implications for quality improvements of turnover, use of contingent workers, and job rotation policies. *Quality Management Journal* 1, no. 1: 9–25.

———. 1999a. *Managing quality fads: How American business learned to play the quality game.* New York: Oxford University Press.

———. 1999b. Learning from the quality movement: What did and didn't happen and why? *California Management Review* 41:43–73.

The cracks in quality. 1992. *The Economist*, 18 April, 67–68.

Crosby, Philip B. 1979. *Quolity is free: The art of moking quolity certain.* New York: McGraw-Hill.

Dean, James W., and J. R. Evans. 1994. *Total quolity: Management, organization, and strategy.* St. Paul, Minn.: West Publishing.

Delta Consulting Group. 1993. *Ten years after: Learning about total quality management.* New York: Delta Consulting Group.

Denison, Daniel. 1989. Corporate culture ond organizational effectiveness. New York: Wiley.

Easton, G. S., and S. L. Jarrell. 1998. The effects of total quality management on corporate performance: An empirical investigation. *Journal of Business* 71, no. 1:15–35.

Edwards. C. D. 1968. The meaning of quality. *Quality Progress* (October): 37.

Ernst and Young, and the American Quality Foundation. 1992. International quality study: The definitive study of the best international quality management practices. Cleveland: Ernst and Young.

Feigenbaum, Armand V. 1983. *Total quality control.* New York: McGraw-Hill.

Flynn, Barbara, Roger Schroeder, and Sadao Sakakibara. 1995. The impact of quolity management practices on performance and competitive advontage. *Decision Sciences* 26, no. 5:659–691.

Fuchs, Edward. 1996. Discussion of chimera or culture? *Quality Management Journal.* 3, no. 3:39–40.

Fuchsberg, Gilbert. 1992. Quality programs show shoddy results. *Wall Street Journal,* 14 Moy, B1, B4.

Garvin, D. A. 1988. *Managing quality: The strategic and competitive edge.* New York: Free Press.

General Accounting Office. 1991. *Management practices: U.S. companies improve performance through quality efforts.* Washington, D.C.: U.S. Government Accounting Office.

Greene, Richard T. 1993. *Global quality: A synthesis of the world's best management methods.* Homewood, Ill.: Business One Irwin.

Grandzol, J. R., and M. Gershon. 1997. Which TQM practices really matter: An empirical investigation. *Quality Management Journal* 4, no. 4:43–59.

Hackman, J. Richard, and Ruth Wogeman. 1995. Total quality management: Empiricol, conceptual, and practical issues. *Administrative Science Quarterly* 40, no. 2:309–342.

Haim, A. 1993. *Does quality work? A review of relevant studies.* Report #1043. New York: The Conference Board.

Handfield, Robert, and Soumen Ghosh. 1994. Creating a total quality culture through organizational change: A case study. *Journal of International Marketing* 2:7–36.

Harzing, Anne-Wil, and Geert Hofstede. 1996. Planned change in organizations: The influence of notional culture. In *Research in the sociology of orgonizations*, edited by Samuel B. Bocharach, Peter A. Bamberger, and Miriam Erez. London: JAI Press.

Hendricks, Kevin B., and Vinod R. Singhal. 1997a. Does implementing an effective TQM program actually improve operating performonce? Empiricol evidence from firms that have won quality awards. *Management Science* 43, no. 9:1258–1274.

———. 1997b. The long-run stock price performance of firms with effective TQM progroms as proxied by quolity award winners. Working paper, College of William and Mary.

———. 1998. Firm characteristics, total quality management, and financial performance: An empirical investigation. Working paper, College of William and Mary.

Japanese Industrial Standards Committee Z8101. 1981. Industrial standardization 1981.

Juran, Joseph M. 1974. The quality control handbook. New York: McGraw-Hill.

———. 1989. Juran on leadership for quality. New York: Free Press.

———. 1992. Juran on quality by design. New York: Free Press.

Kelly, K. 1992. Quality: Small and midsize companies seize the challenge. Business Week, 30 November, 66–69.

Khurana, Anil. 1994. Quality in the global color picture tube industry: Managing complex production processes. Doctoral diss., University of Michigan Business School.

Larcker, David F., and Christopher D. Ittner. 1997. Measuring nonfinancial assets. Wharton Magazine (winter): 7–12.

Leffler, K. B. 1982. Ambiguous changes in product quality. American Economic Review (December): 956.

National Institute of Standards and Technology (NIST). 1992. Malcolm Baldrige National Quality Award Application Guidelines. Washington, D.C.: U.S. Department of Commerce.

———. 1997. Return on quality. Washington, D.C.: U.S. Department of Congress.

Peters, Thomas J., and Robert H. Waterman. 1982. In search of excellence. New York: Harper and Row.

Peterson, Marvin, and Kim Cameron. 1995. Total quality management in higher education: From assessment to improvement. Ann Arbor: University of Michigan, Center for the Study of Higher and Post-secondary Education.

Pirsig, R. 1974. Zen and the art of motorcycle maintenance. New York: Bantam.

Powell, T. C. 1995. Total quality management as competitive advantage: A review and empirical study. Strategic Management Journal 16:15–37.

Quinn, Robert E., and Kim S. Cameron. 1988. Paradox and transformation. Cambridge, Mass.: Ballinger.

Reed, R., D. J. Lemak, and J. C. Montgomery. 1996. Beyond process: TQM content and firm performance. Academy of Management Review 21, no. 2:173–202.

Reimann, Curt W. 1988. The Malcolm Baldrige National Quality Award. Speech given at the Executive Education Center, University of Michigan. Personal communication with the authors.

Sashkin, M., and K. J. Kiser. 1993. Putting total quality management to work. San Francisco: Barrett-Koehler.

Schein, Edgar H. 1985. Organizational culture and leadership. San Francisco: Jossey-Bass.

The straining of quality. 1995. The Economist, 14 January, 55–56.

Taylor, Frederick W. 1912. Report to the 62nd U.S. Congress, 1st session, 1340. Washington, D.C.

Teboul, James. 1991. Managing quality dynamics. New York: Prentice Hall.

Trice, Harrison M., and Janice M. Beyer. 1993. The cultures of work organizations. Englewood Cliffs, N.J.: Prentice Hall.

Westphal, James D., Ranjay Gulati, and Stephen M. Shortell. 1997. Customization or conformity? An institutional and network perspective on the content and consequences of TQM adoption. Administrative Science Quarterly 42, no. 2:366–394.

BIOGRAPHIES

Kim Cameron is dean and the Albert J. Weatherhead III Professor of Management at the Weatherhead School of Management at Case Western University. In addition to quality, he is currently conducting investigations of human virtues, such as forgiveness, in organizational settings.

Cameron earned a Ph.D. in administrative science from Yale University. He may be contacted as follows: Weatherhead School of Management, Case Western Reserve University, Cleveland, OH 44106; Telephone: 216-368-2046; Fax: 216-368-2845; E-mail: ksc6@po.cwru.edu .

Wesley Sine is a doctoral candidate at the School of Industrial and Labor Relations at Cornell University. In addition to studies in quality, he is investigating deregulation in utilities and the creation of new organizational forms.

Sine earned two master's degrees, in organizational behavior and in international studies, from Brigham Young University. He may be contacted as follows: School of Industrial and Labor Relations, Cornell University, Ithaca, NY 14853; Telephone: 607-255-9804; Fax: 607-255-2261; E-mail: wds4@cornell.edu .