



Reports

The Managerial Path to Return on Quality: How Individual and Collective Belief Systems Evolve in the Firm (04-107)

Christine Moorman, Roland T. Rust, and Peter R. Dickson

What Drives New Product Success? An Investigation across Products and Countries (04-108)

Katrijn Gielens and Jan-Benedict E. M. Steenkamp

Weathering Tight Economic Times: The Sales Evolution of Consumer Durables over the Business Cycle (04-109)

Barbara Deleersnyder, Marnik G. Dekimpe, Miklos Sarvary, and Philip M. Parker

Advertising Spending and Market Capitalization (04-110)

Amit Joshi and Dominique M. Hanssens

The Effects of Customization Procedure on Consumer Preferences and Satisfaction (04-111)

Ana Valenzuela, Ravi Dhar, and Florian Zettelmeyer

2 0 0 4

W O R K I N G
P A P E R
S E R I E S

I S S U E T W O

N O . 0 4 - 0 0 2

MSI

Reports

Executive Director

Leigh M. McAlister

Research Director

Ross Rizley

Editorial Director

Susan Keane

Publication Design

Laughlin/Winkler, Inc.

The Marketing Science Institute supports academic research for the development—and practical translation—of leading-edge marketing knowledge on issues of importance to business performance. Topics are identified by the Board of Trustees, which represents MSI member corporations and the academic community. MSI supports academic studies on these issues and disseminates findings through conferences and workshops, as well as through its publications series.

Marketing Science Institute
1000 Massachusetts Avenue
Cambridge, MA
02138-5396

Phone: 617.491.2060
Fax: 617.491.2065
www.msi.org

MSI Reports (ISSN 1545-5041) is published quarterly by the Marketing Science Institute. It is not to be reproduced or published, in any form or by any means, electronic or mechanical, without written permission.

The views expressed here are those of the authors.

MSI Reports © 2004
Marketing Science Institute
All rights reserved.

Working Paper Series

The articles that appear in *MSI Reports* have not undergone a formal academic review. They are released as part of the MSI Working Paper Series, and are distributed for the benefit of MSI corporate and academic members and the general public.

Subscriptions

Annual subscriptions to *MSI Reports* can be placed online at www.msi.org. Questions regarding subscriptions may be directed to pubs@msi.org.

Single reports

Articles in *MSI Reports* are available in downloadable (PDF) format at www.msi.org.

Past reports

MSI working papers published before 2003 are available as individual hard-copy reports; many are also available in downloadable (PDF) format. To order, go to www.msi.org.

Corporate members

MSI member company personnel receive all MSI reports (PDF and print versions) free of charge.

Academic members

Academics may qualify for free access to PDF (downloadable) versions of MSI reports and for special rates on other MSI print publications. For more information and to apply, go to "Qualify for academic membership" on www.msi.org.

Classroom use

Upon written request, MSI working papers may be copied for one-time classroom use free of charge. Please contact MSI to obtain permission.

Search for publications

See the searchable publications database at www.msi.org.

Submissions

MSI will consider a paper for inclusion in *MSI Reports*, even if the research was not originally supported by MSI, if the paper deals with a priority subject, represents a significant advance over existing literature, and has not been widely disseminated elsewhere. Only submissions from faculty members or doctoral students working with faculty advisors will be considered. "MSI Working Paper Guidelines" and "MSI 2004-2006 Research Priorities" are available in the Research section of www.msi.org.

Publication announcements

To sign up to receive MSI's electronic newsletter, go to www.msi.org.

Change of address

Send old and new address to pubs@msi.org.

2 0 0 4

W O R K I N G
P A P E R
S E R I E S

I S S U E T W O

N O . 0 4 - 0 0 2

The Managerial Path to Return on Quality: How Individual and Collective Belief Systems Evolve in the Firm

Christine Moorman, Roland T. Rust, and Peter R. Dickson

With growing attention to marketing ROI, many firms seek to increase revenues by improving customers' perceptions of quality. This longitudinal study looks at how this approach is manifested in individual beliefs and collective knowledge systems within firms.

Report Summary

Efforts to improve quality are increasingly being evaluated by firms as investments, rather than costs. This measurement of return on investments in improving quality is called *return on quality*.

A *revenue emphasis* toward return on quality seeks to improve revenues by increasing customers' perceptions of quality, leading to greater customer satisfaction and loyalty. It has been shown to produce higher financial returns than either a *cost emphasis*, which seeks to reduce costs by increasing internal efficiency, or a *dual emphasis*, which seeks to emphasize both revenue expansion and cost reduction.

But how can a firm implement a revenue emphasis toward return on quality? Here, authors Moorman, Rust, and Dickson focus on how a revenue emphasis toward return on quality is manifested in the beliefs of individual managers and in firms' collective knowledge systems, how these levels of revenue emphasis change over time, and the performance implications of revenue emphasis at both levels of an organization. They perform a longitudinal, within-

subjects study of return on quality, surveying managers at two points in time and capturing firm performance three years after the initial assessment of revenue emphasis.

The authors hypothesize and show that the revenue emphasis has its greatest impact on firm performance when it resides both in the minds of individual managers and in the shared mental model of the organization. These advantages are sustained across financial performance, customer relationship performance, and new product/service development performance outcomes.

Another key finding is that firms' revenue emphases toward return on quality tend to evolve from the individual to the collective level, not from the collective to the individual level. Therefore, revenue emphasis begins by residing most strongly among individual managers, followed by subsequent consolidation through organization-wide knowledge systems, practices, and procedures. Importantly, levels of individual and collective revenue emphasis tend to converge over time. ■

Christine Moorman is Professor of Marketing, Duke University, Fuqua School of Business.

Roland T. Rust is David Bruce Smith Chair in Marketing, Robert H. Smith School of Business, University of Maryland.

Peter R. Dickson is Knight Ridder Eminent Scholar in Global Marketing, College of Business Administration, Florida International University.

Introduction

Firms increasingly seek to evaluate the return on investment from their marketing efforts, and an important emerging area of research involves making marketing financially accountable (e.g., Ofek and Srinivasan 2002; Rust, Lemon, and Zeithaml 2004). In fact, the number-one priority of the Marketing Science Institute for 2002–2004 is “assessing marketing productivity (return on marketing)” (MSI 2002). With an increasing number of firms wishing to obtain measurable returns from their managerial efforts, one area of considerable attention has been how an organization achieves a return on investments from improving quality (Johnson and Gustafsson 2000). This effort is known in the literature as *return on quality* (Rust, Zahorik, and Keiningham 1995), and the last 10 years have seen several notable approaches proposed to address this issue (e.g., Heskett et al. 1994; Kamakura et al. 2002).

Rust, Moorman, and Dickson (2002) identify three emphases that the firm can have toward return on quality—a revenue emphasis, a cost emphasis, and a dual emphasis. In the revenue emphasis, the firm primarily seeks to increase quality as perceived by the customer, leading to greater customer satisfaction, loyalty, and revenues. In the cost emphasis, the firm primarily seeks to increase quality in terms of internal efficiency, leading to cost reductions. The dual emphasis seeks to emphasize both revenue expansion and cost reduction at once. Their empirical research provides evidence that a revenue emphasis produces the highest financial returns, based on both survey responses and objective financial results.

Although the revenue emphasis appears to provide the best financial returns, it remains unclear *how* that emphasis can be implemented in a firm. To study this, we could examine the policies, programs, structures, and resource-allocation activities of firms with this emphasis. But we could also examine a firm’s beliefs or knowledge systems that constitute its “mental model”

of return on quality (e.g., Day and Nedungadi 1994). A focus on beliefs and knowledge follows a rich tradition in the cognitive approach to strategy that examines the individual knowledge of managers and the collective knowledge espoused by the organization (e.g., Daft and Weick 1984; Porac, Meindl, and Stubbart 1996; Rosa et al. 1999; Walsh 1995; Weick 1995). Research in this tradition links cognitive manifestations of strategy to how firms behave (e.g., Rosa et al. 1999) and perform (Day and Nedungadi 1994; Deshpandé, Farley, and Webster 1993).

Using this latter approach, we seek to uniquely depict and assess the revenue emphasis toward return on quality in the beliefs of individual managers and the collective knowledge system of the firm. We examine the performance implications associated with developing a revenue emphasis both in individuals and at the collective level or whether one location is sufficient to influence performance. While most research tends to examine either the individual level or the collective level, we predict that the revenue emphasis will have its greatest impact on firm performance when it resides both in the minds of individual managers *and* in the shared mental model of the organization. We also investigate what factors might influence the likelihood of this convergence.

A final consideration is how the location and level of a firm’s approach to return on quality might evolve over time, if at all. Does the revenue emphasis evolve in individual managers through a process of infusing a shared set of beliefs, knowledge, and goals? Or do managers learn the revenue emphasis in the process of working to influence the firm’s overall position on important strategic issues?

We address these questions in a longitudinal, within-subjects study of return on quality. Our approach examines the evolution of a firm’s revenue emphasis toward return on quality by surveying managers at two points in time and by capturing firm performance three years after the initial assessment of its revenue emphasis.

Individual and Collective Approaches to Return on Quality

The question of where a firm's approach to return on quality resides can be answered by following Walsh and Ungson (1991), who argue that there are five retention bins or repositories for knowledge in organizations: (1) individual members, (2) roles and organizational structures, (3) the firm's standard operating procedures, (4) the firm's culture, and (5) the firm's physical structure.

We will use the term *individual revenue emphasis* to describe an individual manager's belief that return on quality is primarily driven by customer satisfaction and customer retention, and *collective revenue emphasis* to describe the organizational beliefs that return on quality is primarily driven by customer satisfaction and customer retention. Others have referred to collective knowledge as "collective cognitive maps" (Axelrod 1976; Bartunek 1984), "team mental models" (Klimonski and Mohammed 1994), "collective cognition" (Langfield-Smith 1992), and "negotiated belief structures" (Walsh and Fahey 1986).

While few would argue that individuals are without knowledge and beliefs, the idea that an organization can have knowledge outside of the individuals that make up the organization is a bit more controversial. Despite this, there is mounting evidence for the existence of a customer focus at the firm level. Researchers have examined the organization's approach to market orientation as an *organization-wide* process for collecting, disseminating, and using customer information (Kohli and Jaworski 1990), as a *collectively* held mental model (Day and Nedungadi 1994), as a set of collective beliefs (Narver and Slater 1990), and as a learning system held at the *organizational* level (Slater and Narver 1995). More generally, researchers have conceived of culture as a *collective* knowledge system (e.g., Deshpandé and Webster 1989; Homburg and Pflesser 2000), *organizational* memory as a knowledge system

(Moorman and Miner 1997; Walsh and Ungson 1991), *organizational* intelligence as the capability to process and use information to facilitate adaptive behavior (Glynn 1996), and strategy as a *collective* belief in a strategic orientation toward innovation, competition, and profits (e.g., Lyles and Schwenk 1992; Miles and Snow 1978).

Weick and Roberts (1993) argue that the "collective mind" in an organization is a set of activities and outputs that reflect shared knowledge. As two examples, Barr (1998) and Bettman and Weitz (1983) examine letters to shareholders as evidence of firm interpretations of environmental events, and Weick and Roberts (1993) present the interrelations among people working on an aircraft carrier as evidence that a broader collective cognition is operating. Frankwick et al. (1994) describe how R&D and marketing functions at one firm held very different means-end beliefs about a new customer-service innovation, and a consensus only emerged after one function gained greater control of the project, and hence the collective beliefs. Argote and Ingram (2000) cite an example of software affecting the way that organizational members frame and solve problems without clearly changing the beliefs of individual members. All of these examples support Durkheim's (1938, cited in Walsh 1988, p. 15) observation that there are "collective ways of acting or thinking (that) have a reality outside of the individuals who, at every moment of time, conform to it."

Despite this acknowledgement that collective knowledge exists, research has not generally established that it is distinct from individual knowledge. In one exception, Moorman (1995) demonstrated that individual and organizational use of market information can be distinguished. We follow Moorman (1995) and demonstrate that individual and collective revenue emphases to return on quality are distinct. Table 1 describes how individual and collective revenue emphases can converge or diverge.

Table 1

How Individual and Collective Revenue Emphases Can Converge or Diverge

Collective Revenue Emphasis	Yes	Individual managers and the larger collective both espouse beliefs, goals, or norms focused on customers.	Larger collective espouses beliefs, goals, or norms focused on customers, but individual managers are focused on costs.
	No	Individual managers espouse beliefs, goals, or norms focused on customers, but larger collective is focused on costs.	Individual managers and the larger collective both espouse beliefs, goals, or norms focused on costs.
		Yes	No
		Individual Revenue Emphasis	

The Performance Impact of Individual and Collective Revenue Emphases

We begin by considering the long-term impacts of individual and collective revenue emphases on firm performance. In particular, we examine the effects of a revenue emphasis toward return on quality residing in the individual, in the collective, or in both locations. We argue that a revenue emphasis at *both* the individual and collective levels will have the greatest impact on performance for several reasons.

First, alignment may reduce inefficiencies created by time delays that occur when communications are needed to educate individual managers about organizational goals or approaches related to customers. In addition, if managers do not agree with collective thinking or are simply trapped in status-quo routines and thinking, time delays and cost increases are likely if incentives are required to motivate managers to implement revenue approaches with which they do not agree.

Second, a revenue emphasis held at both levels may have a synergistic effect—as opposed to a redundant effect—on the implementation of customer-centered approaches to return on

quality. Dickson, Farris, and Verbeke (2001) suggest that a learning network effect can occur between individual and collective sources of knowledge within the firm so that each source reinforces and supports a specific focus. The mutual-reinforcement effect of these knowledge sources reduces the likelihood that return-on-quality systems—like all learning systems—will evolve toward the use of short-term, cost-reduction criteria (Levinthal and March 1993; March 1991).

Another synergistic effect is possible if the collective revenue emphasis continues to improve as a result of the experiences, inputs, and initiatives generated by individual managers. This view of belief systems, starting with individuals and moving through higher levels of the organization, is a key part of Grant’s (1996) model of organizational capability as knowledge integration; Crossan, Lane, and White’s (1999) 4I conceptual model of organizational learning moving from individual to the collective; and Dougherty’s (1990) finding that market knowledge creation moves through several cycles and levels in firms.

For all of these reasons, we expect that a revenue emphasis should have a stronger effect on firm performance when held at both individual and collective levels of the firm. We propose:

H1: A revenue emphasis at both the individual level and the collective level will increase firm performance beyond that contributed by either the individual or collective level alone.

Evolution of individual and collective revenue emphases over time

Separating out the individual and collective revenue emphases toward return on quality allows us to study how these factors evolve over time. This is an important issue that has received little attention. As noted by Spender and Grant (1996, p. 6), “The surge of interest into organizational capability and competencies has directed attention to organizational embedded knowledge, but has made only limited

progress in understanding its anatomy and creation.”

There is a long tradition of research directly suggesting that firms can learn about customer-related issues, such as a revenue emphasis (e.g., Day 1994; Kohli and Jaworski 1990; Slater and Narver 1995; Moorman 1995). And yet there is very little evidence pertaining to *how* firm learning is influenced by the relative impact of individual and collective sources of knowledge.

Some argue that collective systems drive individual activities in ways unnoticed by individuals (e.g., Argote 1999; Granovetter 1985). For example, Hutchins (1991) describes a case study of a group that relied on existing group communication and hierarchy to create an impromptu navigational system on a distressed boat entering a harbor. Though the system worked, no individual group member fully grasped the system or why it was working. More generally, organizational beliefs, goals, systems, routines, and structures may socialize, direct, and otherwise compel individuals to think and act in certain ways (e.g., Bontis, Crossan, and Hulland 2002). We refer to this type of learning as *collective-to-individual learning*.

One view of individual-driven organizational learning suggests that individuals learn and then this information is shared with other members who, when aggregated, form a collective focus (Crossan, Lane, and White 1999; Cyert and March 1963; Glynn 1996; Sinkula 1994). Another view examines how the organizational activities bear the imprint of individual members. In this view, an individual learns and the outcome (which usually constitutes some change) is retained by the organization (Argote 1999; Miner 1989). We refer to these two learning processes as *individual-to-collective learning*.

Of these two approaches, we think it is most likely that organizational learning about a revenue emphasis to return on quality will occur in an individual-to-collective fashion. Our

rationale is threefold. First, the revenue emphasis is not the typical way in which most firms organize their return-on-quality systems—which are often around cost-based incentive and control systems. One historic reason for this is the difficulty of linking customer satisfaction to profits (Rust, Zahorik, and Keiningham 1995). Second, organizational incentive systems are often designed for short-term profits (achieved through cost controls), while the health of long-term marketing assets is neglected (Srivastava, Shervani, and Fahey 1998). Third, many firms are still organized exclusively by function and not around customer-related tasks such as those important to a revenue emphasis (e.g., Moorman and Rust 1999). Consistent with all of these ideas, Rust, Moorman, and Dickson (2002) find that revenue emphases toward return on quality are relatively young and not yet widely adopted by firms.

Given these constraints, a revenue emphasis toward return on quality will likely remain the purview of the individual manager or specific functions and not of the overall organization. As a result, a revenue emphasis is more likely to emanate from individuals close to the customer, such as frontline service employees, boundary-spanners (such as salespeople), and new-product specialists, than from the organization overall. We predict:

H2: Organizational learning about the revenue emphasis to return on quality occurs through an individual-to-collective process with individual revenue emphasis leading to changes in collective revenue emphasis.

If organizations learn about a revenue emphasis toward return on quality through an individual-to-collective process, this implies there should be greater convergence in the content of individual and collective levels as the organization evolves over time. This view is consistent with the idea that knowledge can diffuse between these two levels of the firm (e.g., Argote et al. 2000; Meindl, Stubbart, and Porac 1994). Consequently, we predict there will be weaker

convergence between individual and collective revenue emphasis at time 1 and that this convergence will increase at time 2.

H3: The convergence of individual and collective levels of revenue emphasis toward return on quality will be weaker at time 1 than at time 2.

Factors affecting the gap between individual and collective revenue emphases

We now examine how a firm may improve the likelihood of convergence between individual and collective revenue emphases toward return on quality. We focus on both the organizational and the individual factors that influence this gap.

Organizational Factors. The first factor is the presence of *organizational processes or routines for using quality information in firms*. These processes typically involve the acquisition, dissemination, and utilization of information (Huber 1991; Jaworski and Kohli 1993; Kohli and Jaworski 1990; Moorman 1995; Sinkula 1994). Their goal is to ensure that information does not get lodged in the mind of a particular manager, level, or functional area of the organization. Instead, vertical and horizontal flows of information increase the likelihood that quality information will permeate all individuals and organizational levels. These processes increase the chances that organizational stores of information are dispersed to all managers. We predict:

H4a: The stronger the organization's processes for using quality information in firms, the smaller the gap between individual and collective levels of revenue emphasis.

The second factor is the level of *cross-functional linkages* in the organization. Like organizational processes for using information, cross-functional linkages reflect greater transmission of information across the firm (e.g., Frankwick et al. 1994; Griffin and Hauser 1992). Therefore, we expect that stronger cross-functional linkages will reduce the gap between individual and collective levels of revenue emphasis. We predict:

H4b: The greater the organization's cross-functional linkages, the smaller the gap between individual and collective revenue emphases.

The third factor is the level of *organizational service orientation*. If an organization has a well-established orientation (knowledge and skills) in a domain, it should follow that the firm will be more successful in educating individual managers in those areas of expertise (e.g., Cohen and Levinthal 1990). Knowledge systems, including training and development, the composition of intranet systems, and the structure of formalized jobs and routines should revolve around those areas of expertise. A service orientation should, therefore, facilitate knowledge of how to develop and maintain customer relationships in both individuals and organizational systems. We predict:

H4c: The greater the organization's service orientation, the smaller the gap between individual and collective revenue emphases.

As discussed earlier, it seems reasonable to view return-on-quality systems as organizational innovations. Therefore, the *origin of the innovation* may influence the convergence of individual and collective levels. Innovations introduced by external agents such as consultants or by competitors may suffer from the "not invented here syndrome," which will limit their acceptance (Katz and Allen 1982). Internally developed innovations, on the other hand, may fit more naturally within current organizational routines because the inventor is using tacit organizational knowledge in the invention process (Nonaka and Takeuchi 1995). We propose:

H4d: Internally produced return-on-quality innovations will result in a smaller gap between individual and collective revenue emphases relative to externally produced return-on-quality innovations.

Individual Factors. Cross-functional linkages were theorized to reduce the gap between indi-

vidual and collective belief systems. Therefore, it follows that *individual functional orientation* or focus on a specific organizational function may increase the gap. The tendency for functional training to create separate thought worlds between various groups within an organization has been well documented (Dougherty 1990, 1992; Griffin and Hauser 1992). Moreover, research focusing on the use of information by managers suggests that functional orientation influences both the social dynamics and the information usage patterns between users and providers of information (Deshpandé and Zaltman 1982, 1984; Fiol 1994; Frankwick et al. 1994). We propose:

H4e: Greater functional orientation of individual managers increases the gap between individual and collective revenue emphases.

Method

Sample and procedure¹

The number of firms actually employing formal return-on-quality programs has been quite limited until recent years. Therefore, we employed as our population every company we could readily identify that was employing such a program, resulting in roughly 100 firms, some of which contained multiple business units. The firms in this set employed an average of 70,000 people each and were from both the service sector and the goods sector.

Access to firms was enhanced by one of the authors' personal connections to the industry; however, this was usually limited to the name of a relevant contact person. To generate respondents for the study, each contact was phoned, and the study was discussed with them at a very abstract level, as a study of quality profitability approaches. If the contact agreed to participate, we utilized two different models of participation, each of which was employed about half the time. The first model involved the contact providing the names of managers in their organization. Using this approach, we mailed question-

naires to 185 managers in 75 different business units and received responses from 69 managers representing 44 business units (37.3% response rate). The second model involved sending questionnaires to a contact person who was entrusted to send them to managers in the firm. If this model was used, the contact was asked to pick randomly among those managers who would have exposure to these systems. Contacts at 35 business units agreed to distribute 664 questionnaires to managers. Of these, eight business units ultimately did not return any questionnaires. Of the remaining 27 business units and 368 questionnaires mailed to firms, we received responses from 117 managers (31.8% response rate). The final sample was 186 managers. Data from the two collection models were compared, and no differences were found on any variables used in the analyses.

Respondents reported spending an average of 9.6 hours per week (s.d. = 5.00) making decisions about quality initiatives and reported themselves to be knowledgeable in measurement of customer satisfaction (mean = 5.15/7.00, s.d. = 1.30). Therefore, these individuals appear to meet the knowledgeability and experience requirements suggested for key informant status (Campbell 1955).

To address whether a revenue emphasis emerges through collective or individual learning processes and to assess the impact of a revenue emphasis on firm performance, it was necessary to collect information about individual and collective revenue emphases at two points in time. Therefore, three years following the initial data collection, all 186 respondents were sent a follow-up questionnaire containing the individual and collective revenue emphases measures and the firm performance measures. Of the original sample, 38 respondents were no longer eligible, due to respondents having left their firms, firms having gone out of business, or respondent death, reducing the eligible sample to 148 respondents (186 - 38 = 148). Of these, 74 responded to the second wave of surveys, for a response rate of 50%. No differences were

found between the time 1 and time 2 samples on key organizational characteristics, revealing no evidence of selection bias.

Measurement

Revenue Emphasis. To reduce measurement error, we developed measures of individual and collective revenue emphases using similar content and construction. At the individual level, informants were asked to rate the degree to which they believed certain statements to be true about initiatives to improve the quality of products and processes. Specifically, informants were asked to rate “the degree to which you believe the following statements to be true about initiatives to improve the quality of products and processes,” including “Quality improvements should be differentiated by their impact on customer satisfaction/retention,” “The purpose of quality improvements is to improve customer satisfaction/retention,” and “It is best to invest in improving those quality initiatives that greatly increase customer satisfaction/retention.”

To capture the collective level, respondents were asked to rate “the degree to which the managers in your division agree with the following statements about initiatives to improve the quality of products and processes.” The exact same questions were asked. Asking managers to rate their perception of shared beliefs in the organization is one way to capture the firm’s “collective mind,” “organizational memory,” and “organizational cognitive system” (Sandelands and Stablein 1987; Walsh 1995; Weick 1979). Deshpandé, Farley, and Webster (1993) also utilize managers’ agreement regarding norms when measuring a firm’s customer orientation. By focusing on agreement, we are not suggesting that a collective revenue emphasis is literally the combined effect of individual revenue emphases. Instead, we use agreement as a way to tap into the manager’s sense of culture or *shared* beliefs and goals in the overall organization. We address the construct validity of our measurement approach in greater detail below.

We began with a set of five items for measuring a revenue emphasis. However, through a process of measure refinement involving reliability estimates, discriminant validity exercises, and the need to have the same measures across both levels of analysis and across time periods, we ended up with three items per measure (see appendix). The final Cronbach alpha for each measure reveals a reasonable level of internal consistency: individual revenue emphasis at time 1 ($\alpha = .68$), collective revenue emphasis at time 1 ($\alpha = .78$), individual revenue emphasis at time 2 ($\alpha = .76$), and collective revenue emphasis at time 2 ($\alpha = .77$). The marginal individual revenue emphasis measure at time 1 is not of great concern because we had the constraint of validating measures *across levels* and *across time periods*, which forced a few trade-offs in measure construction.

We further examined discriminant validity among the multi-item measures using confirmatory factor analysis. Our approach was to employ the most stringent test of discriminant validity. Therefore, we examined theoretically-similar subsets of variables, which means that we established the discriminant validity of variables related to one another in a prediction (x,y variables) or variables that shared a similar x or y status across related predictions (e.g., the long-term performance measures). We employed confirmatory factor analysis on each pair of measures by examining the constrained model (constraining the phi between the measures to be perfectly correlated) and the unconstrained model (estimating the phi level). The phi levels were then examined using a chi-squared difference test, with one degree of freedom ($\Delta\chi^2_{(1)} = 3.84, p < .05$). The model in which phi is freely estimated should have a significantly better fit relative to the constrained model if the two measures reflect distinct domains.

In all cases, the model in which phi is free (not constrained) fits significantly better.² Of particular interest are results indicating the discriminant validity of individual and collective

revenue emphases *within* each time period at both time 1 ($\Delta\chi^2_{(1)} = 21.8, p < .05$) and time 2 ($\Delta\chi^2_{(1)} = 20.4, p < .05$). Results also indicate that measures of individual revenue emphasis *across* time 1 and time 2 can be differentiated ($\Delta\chi^2_{(1)} = 47.4, p < .05$), as can measures of collective revenue emphasis ($\Delta\chi^2_{(1)} = 18.7, p < .05$). Detailed measure information is in the appendix and Table 2.

Given the relative novelty of our empirical effort to measure these different levels of revenue emphasis, we validated the collective measure of revenue emphasis using an additional step. Specifically, there is a subset of time 1 data collected from managers within the same business unit. Given this, it is possible to examine the extent to which a respondent's report of collective revenue emphasis approximates the average of the individual revenue emphasis levels reported from other managers in his or her business unit. This approach is typical in research examining a purely collective approach (e.g., Nelson and Mathews 1991). To examine this, we created a collective revenue emphasis that is the aggregate of the individual revenue emphasis levels reported from managers in each business unit. We could do this for 49 business units at time 1. Comparing the individual manager's report of collective revenue emphasis to this calculated measure of collective revenue emphasis, we find a significant correlation ($\rho = .36, p < .01$). Further, in a factor analysis of the two measures, they load on a single factor (eigenvalues = 1.36, explained variance = 67.99%). These results provide additional evidence that the individual self-reports of collective revenue emphasis are valid. (Note that using the aggregated measure of revenue emphasis is not possible throughout the analysis, given the small number of managers across time for which we have reports from multiple managers from the same business unit.)

Finally, we also established nomological validity—a special type of construct validity—of our measures (e.g., Cronbach and Meehl 1955). As noted by Peter (1981, p. 135),

“Nomological validation is primarily ‘external’ and entails investigating both the theoretical relationship between different constructs and the empirical relationship between measures of those different constructs.” For example, collective revenue emphasis should be more closely related to organizational experience in evaluating customer satisfaction outcomes, and individual revenue emphasis should be more closely related to individual experience. If these logical relationships do not hold, the distinctiveness of the two levels of revenue emphasis is called into question.

To examine nomological validity, several of our tests used OLS regression models in which individual and collective revenue emphases were entered as predictors of one of the related organizational or individual features.³ A *t*-test of the difference between the standardized coefficients was then performed. Results indicate that, compared to individual revenue emphasis ($b = -.08, p < .01$), collective revenue emphasis ($b = .20, p < .01$) is more strongly related to organizational experience levels evaluating customer satisfaction and retention outcomes ($t = -6.88, p < .01$). Likewise, results indicate that compared to collective revenue emphasis ($b = -.05, p < .01$), individual revenue emphasis ($b = .09, p < .05$) is more strongly related to individual experience in evaluating customer satisfaction and retention outcomes ($t = -3.44, p < .05$).

A final test addressed whether our collective revenue emphasis measures are actually tapping that construct domain. To examine this, at time 1, we also collected a set of measures that asked informants, “Rate the extent to which your division encourages managers to take the following actions regarding efforts to improve the quality of products and processes.” The items were: Differentiate quality improvement efforts by their impact on customer satisfaction/retention; invest in improving those activities that greatly increase customer satisfaction/retention; and build revenues by increasing customer satisfaction/retention. These items formed a scale ($\alpha = .76$). These items focus more on the degree to

Table 2
Measure Characteristics and Intercorrelations

Measure	Mean	S.D.	Items	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1. Individual Revenue Emphasis (t1) ¹	5.67	.80	3	184	<i>.68</i>																	
2. Collective Revenue Emphasis (t1) ¹	5.08	1.11	3	178	.32	<i>.78</i>																
3. Individual Revenue Emphasis (t2)	5.73	.88	3	74	.18	.07	<i>.76</i>															
4. Collective Revenue Emphasis (t2)	5.72	.87	3	74	.16	.24	.57	<i>.77</i>														
5. Organizational experience with customer outcomes	5.00	1.36	1	176	-.03	.17	-.06	-.08														
6. Individual experience with customer outcomes	5.15	1.30	1	185	.09	-.02	-.28	-.28	.39													
7. Marketing functional orientation	.46	.50	1	184	.14	-.04	-.17	-.04	.05	.04												
8. Organizational processes for using quality information	3.72	1.22	5	177	-.09	.32	-.14	-.18	.32	.16	.01	<i>.80</i>										
9. Cross-functional linkages	3.74	1.29	3	181	-.11	.17	-.21	-.13	.21	-.01	.19	.31	<i>.79</i>									
10. Organizational service orientation	4.65	2.16	1	185	-.16	.06	.05	0	.11	.15	-.16	.13	-.01									
11. Origin of quality innovation (0 = external, 1 = internal)	.64	.48	1	178	-.06	.21	.12	.13	.14	.12	-.09	.23	.14	.04								
12. Individual manager quality experience level	5.15	1.30	1	169	.11	.13	-.09	.25	-.07	.06	-.04	.10	-.16	.02	.13							
13. Firm financial performance (t2)	4.85	.96	3	74	-.17	.05	.16	.17	-.03	.08	-.03	.15	-.07	-.03	.26	0	<i>.77</i>					
14. Firm customer relationship performance (t2)	4.71	.80	3	74	.02	.12	.05	.13	.03	.04	-.09	.25	-.09	-.01	.40	-.09	.49	.82				
15. Firm new product/service performance (t2)	4.22	.93	3	73	.17	0	.04	-.03	.09	.08	-.10	.33	.04	-.14	.20	-.15	.32	.38	.76			
16. Environmental turbulence	4.73	.91	9	186	.14	.06	-.19	-.12	-.02	-.01	.03	.03	-.08	-.21	-.12	.04	-.29	.04	.07	.76		
17. Individual manager job performance	5.24	.92	3	177	.15	-.06	-.05	.25	-.12	.04	-.09	.02	-.15	-.05	0	.30	.13	.10	.04	.20	.80	

Notes: Correlations: $r > .15$, $p < .05$. Coefficient alpha is on the diagonal (in italics) for multi-item measures. ¹ Time 1 means for individual and collective revenue emphasis are for the entire time 1 sample. Consequently, these numbers do not match the means reported in the results, which are for the sample that is retained across both time 1 and time 2.

which the collective (the division) is asking managers to behave in certain ways. We find that our measure of individual revenue emphasis has no relationship to the more behavioral, collective measure ($\rho = -.03, n.s.$) and that our measure of collective revenue emphasis has a strong positive relationship ($\rho = .50, p < .001$). This set of findings provides greater assurance that our collective measure of revenue emphasis is tapping into broader cultural norms and processes.

Firm Performance Measures. Firm performance measures relied on managers' perceptions rather than on more objective outcomes. This approach was selected for several reasons. First, some research has suggested that managers' perceptions are, in fact, generally consistent with objective measures of performance (Dess and Robinson 1984). Second, objective outcomes may be difficult to interpret, as published data are often designed to capture an overall-firm, as opposed to a business-unit, level of analysis. This, in turn, results in independent and dependent variables at different levels of analysis (Hu, Toh, and Lee 1996). Third, the biggest problems associated with managers' perceptions tend to arise with cross-sectional surveys, as a result of common method bias, due to the assessment of independent and dependent variables in the same survey. To reduce the likelihood of common method bias, we asked managers to rate their firm performance in a second wave of surveys, three years after their initial revenue emphasis measures were collected.

Three types of firm performance were collected. All measures asked managers to rate their division's performance relative to the division's goals and objectives. Managers rated *financial performance* (e.g., sales, profitability, market share: $\alpha = .77$), *customer relationship performance* (e.g., customer satisfaction, customer retention, and service quality: $\alpha = .76$), and *new product/service development performance* (e.g., financial performance, speed, and innovation level: $\alpha = .82$). Confirmatory factor analysis results provide

support for the discriminant validity of these three measures relative to one another and relative to the revenue-emphasis measures.

Results

Performance impact

Hypothesis 1 predicted that an organization's revenue emphasis would have its strongest impact on performance when it is held at both the individual and collective levels. To test this prediction, three hierarchical regression models were estimated, each reflecting a different aspect of firm performance: financial performance, customer relationship performance, and new product/service development performance. Three focal independent variables were examined: individual revenue emphasis (Step 1), collective revenue emphasis (Step 1), and the interaction between the two (Step 2). The interaction was created using the mean-centered main effects associated with individual and collective revenue emphasis, in order to reduce collinearity. The change-in- F associated with the entry of the interaction was examined for evidence of the joint impact of revenue emphasis held at both the individual and collective levels.

To strengthen the test and reduce concern about response biases, we used the individual and collective revenue emphases predictors collected during wave 1 of the data collection and the firm performance outcomes collected during wave 2, three years later. In addition to the predictor variables, several control variables were also included in the model.⁴ Results support H1 (see Table 3). Considering financial performance of the firm, results indicate that the change-in- F due to the introduction of the interaction term involving individual and collective revenue emphases was significant (Change-in- $F_{(1,48)} = 6.45, p < .05$) and that the coefficient associated with the interaction was positive and significant ($b = .33, p < .05$). Follow-up slope analysis (Aiken and West 1991) indicates that the relationship between

Table 3

The Impact of Collective and Individual Revenue Emphases Toward Return on Quality on Firm Performance

	Firm Financial Performance	Firm Customer Relationship Performance	Firm New Product/ Service Development Performance
Step 1:			
Change in R^2	.24	.32	.29
Change in F	1.59	2.27	2.01
p -value	n.s.	.05	.05
Degrees of Freedom	(10,49)	(10,49)	(10,48)
Step 2:			
Change in R^2	.09	.06	.06
Change in F	6.45	4.49	4.51
p -value	.05	.05	.05
Degrees of Freedom	(1,48)	(1,48)	(1,47)
Final Model:			
Adjusted R^2	.18	.23	.21
F -statistic	2.19	2.62	2.37
p -value	.05	.01	.05
Degrees of Freedom	(11,59)	(10,59)	(10,58)
<i>Control Variables:</i>			
Environmental Turbulence	$b = -.43, t = -3.09^*$	$b = .05, t = -.38$	$b = -.15, t = -1.08$
Individual Manager Performance	$b = .27, t = 2.12^*$	$b = .07, t = .56$	$b = -.01, t = -.06$
Organizational Processes for Using Quality Information	$b = .22, t = 1.71^+$	$b = .22, t = 1.78^+$	$b = .33, t = 2.57^*$
Origin of Innovation	$b = .002, t = .02$	$b = .32, t = 2.68^*$	$b = .11, t = .92$
Organizational Service Orientation	$b = .006, t = .04$	$b = -.004, t = -.03$	$b = -.21, t = -1.55$
Cross-functional Linkages	$b = -.08, t = -.88$	$b = -.18, t = -1.33$	$b = -.003, t = .02$
Individual Marketing Functional Orientation	$b = .11, t = .87$	$b = -.03, t = -.25$	$b = -.24, t = -1.87^+$
Organization Size	$b = -.09, t = -.71$	$b = -.20, t = -1.63$	$b = -.13, t = -1.06$
<i>Predictors:</i>			
Individual Revenue Emphasis	$b = -.28, t = -1.64^+$	$b = -.18, t = -1.37$	$b = .20, t = 1.44$
Collective Revenue Emphasis	$b = .07, t = .54$	$b = .22, t = 1.64^+$	$b = -.07, t = -.49$
Individual Revenue Emphasis \times Collective Revenue Emphasis	$b = .33, t = 2.54^*$	$b = .28, t = 2.12^*$	$b = .27, t = 2.12^*$

* $p < .05$, + $p < .10$

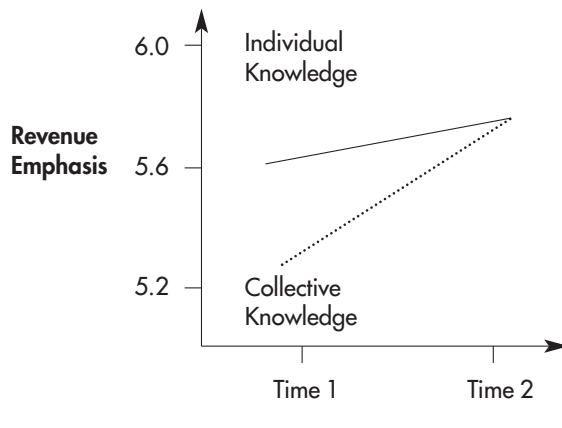
collective revenue emphasis and long-term financial performance is significant and positive at high levels of revenue emphasis ($b = 1.11, p < .05$), becomes zero at moderate levels ($b = .11, n.s.$), and is significant and negative at low levels ($b = -.89, p < .05$), supporting H1. These results replicate for customer relationship per-

formance and new product/service development performance.

Evolution and convergence of emphases

Hypothesis 2 predicted that learning about a revenue emphasis proceeds from an individual level to a collective level, and Hypothesis 3

Figure 1
Change in Revenue Emphasis over Time



predicted greater convergence of individual and collective revenue emphases later, as opposed to earlier, in the diffusion process. To test these predictions, we utilized a 2 x 2, within-subjects GLM predicting an interaction between revenue emphasis *level* (individual, collective) and *time* (times 1 and 2) on *degree* of revenue emphasis.

Results indicate a significant interaction between the two factors ($F_{(1,71)} = 7.32, p < .01, \eta^2 = .09$). A plot of the interaction contained in Figure 1 indicates that at time 1 there is a gap between collective ($M = 5.33$) and individual ($M = 5.68$) revenue emphasis. However, at time 2, this gap diminishes: the collective level rises ($M = 5.72$), and the individual level stays much the same ($M = 5.73$). These results indicate that (1) a firm's revenue emphasis appears to evolve through an individual-to-collective learning process, as predicted in H2, and (2) there is a greater convergence in individual and collective revenue emphases over time, as predicted in H3.

Factors affecting the gap between emphases

Given the gap between individual and collective revenue emphasis at time 1, H4a–H4e examined factors that influence their convergence. We used a general linear model with one two-level, within-subjects factor reflecting revenue-emphasis level (collective and individual levels) and five between-subjects covariates predicted

to influence the gap. A significant interaction between revenue emphasis level and a covariate indicates that the covariate influences the relationship between individual and collective levels of revenue emphasis.

Results indicate that the following factors interacted with the individual vs. collective revenue emphasis level and support H4a–H4e: organizational processes for using quality information ($F_{(1,144)} = 9.63, p < .05, \eta^2 = .06$), quality innovation origin ($F_{(1,144)} = 3.66, p < .05, \eta^2 = .06$), cross-functional linkages ($F_{(1,144)} = 3.37, p < .05, \eta^2 = .02$), organizational service orientation ($F_{(1,144)} = 3.87, p < .05, \eta^2 = .03$), and individual marketing functional orientation ($F_{(1,144)} = 3.19, p < .05, \eta^2 = .02$). Figures 2a–2e plot these results and reveal two distinct patterns of effects. First, two factors (organizational processes for using quality information and origin of the quality innovation) affected the convergence of collective and individual revenue emphases (see figures 2a and 2d). In this pattern, individual revenue emphasis remained relatively unchanged across different levels of the organizational processes for using quality information and for different origins of quality innovations. However, collective revenue emphasis rose as the processes for using quality information increased and as quality innovations were developed internally.

A second pattern of convergence occurred for the organization's service orientation level and the presence of cross-functional linkages. Unlike the first pattern, these two factors increase convergence in revenue emphasis by *simultaneously* moving individual and collective revenue emphasis toward one another (see figures 2b and 2c). This means that convergence was achieved, in part, from declines in individual revenue emphasis. Both the first and second type of convergence support H4a–H4d. Marketing functional orientation had an opposite effect. Specifically, as functional orientation increased, the rift between individual and collective revenue emphasis also widened, supporting H4e (see Figure 2e). This finding is consistent

Figure 2a
Impact of Organizational Processes for Using Quality Information

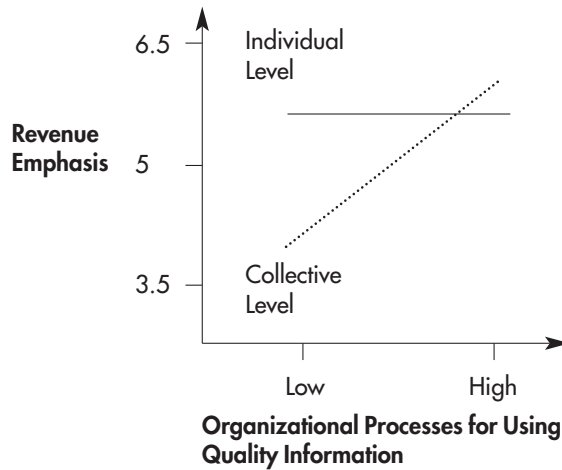


Figure 2d
Impact of Origin of the Quality Innovation

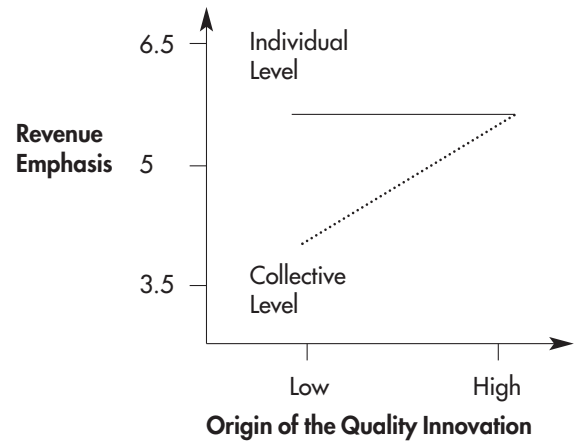


Figure 2b
Impact of Cross-functional Linkages

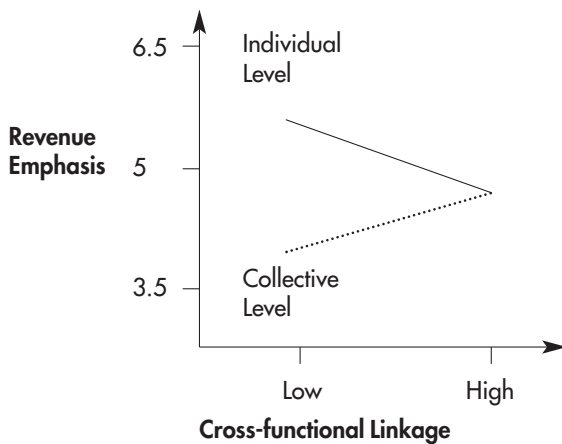


Figure 2e
Impact of Marketing Functional Orientation

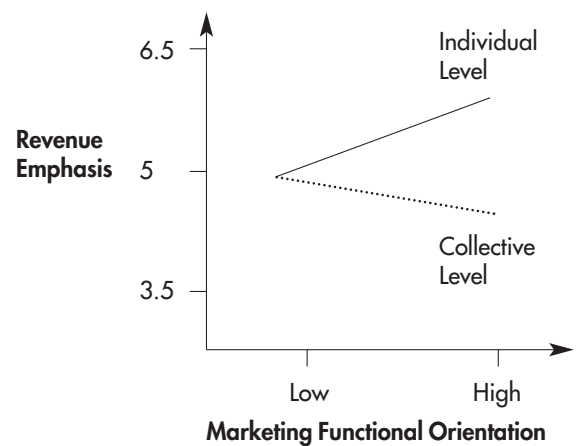
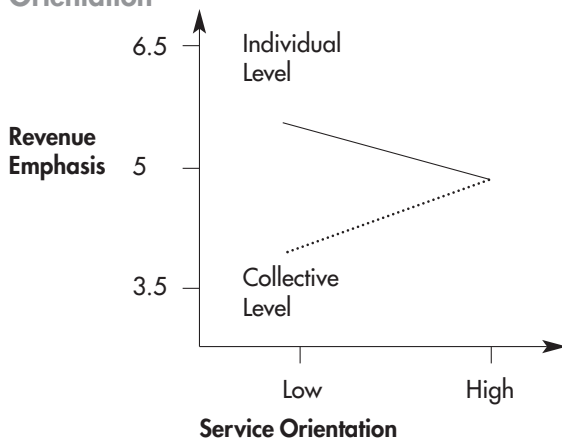


Figure 2c
Impact of Organizational Service Orientation



with the contemporary understanding of functional silos on managerial decision making (Griffin and Hauser 1992).

Discussion

Performance implications of a revenue emphasis

Our research demonstrates the independent status of individual and collective levels of revenue emphasis through careful measurement and follow-up tests. Further, our longitudinal approach provides the opportunity to separate the

measurement of individual-manager and collective revenue emphases from firm performance outcomes.

Using this approach, we find a significant effect for the interaction of individual and collective revenue emphases on long-term performance. This result means that establishing a revenue emphasis at both levels creates the greatest performance advantages. This effect was replicated across financial performance, customer relationship performance, and new product/service performance outcomes collected three years later.

We find it interesting that at high levels of collective revenue emphasis and low levels of individual revenue emphasis there is a negative effect on firm financial performance and new product/service development performance. This suggests that individual managers become less productive and effective in an organizational environment that is not consistent with their beliefs about how return on quality should be achieved. This point is worthy of further investigation.

Organizational learning about a revenue emphasis

Considering the movement of knowledge about a revenue emphasis, our findings suggest that early in its diffusion, a revenue emphasis resides most strongly among individual managers, particularly, we speculate, in change agents who influence the values, beliefs, and behaviors of their organizations. When such a change occurs, it often requires the creation of new control systems, which may take considerable time to become routinized and become the focus of manager attention. This is an example of a new strategic orientation creating a set of new quality-control processes, directed at changing the added-value processes of the firm, all of which must be learned (Dickson 2003). The presence of systems and processes for using quality information, cross-functional linkage processes, a service orientation, and a process where internal agents (rather than external

change agents, such as consultants) introduce quality innovations improves the transfer of knowledge to the collective level.

One observation from our results that we think is both theoretically interesting and managerially relevant is that two firm-level factors that increased the convergence of revenue emphasis levels did so by *decreasing* the individual level of revenue emphasis and increasing the collective level. These were a firm's cross-functional linkages and its service orientation. We speculate that an individual change agent's enthusiasm for the new revenue emphasis gospel they are spreading wanes a little when confronted with the realities of other perspectives that cross-functional communication encourages.

Implications for understanding customer focus

Our research provides an important link between the dozens of articles emphasizing customer focus and the theoretical literature on managerial and organizational cognition. Deshpandé and Webster (1989) describe an organizational-cognition perspective on organizational culture as a focus on the "mind of the manager" and the "organization as a knowledge system" (p. 7). Research has also examined the mental models of managers and firms (Day and Nedungadi 1994; Gatignon and Xuereb 1997), the nature and impact of knowledge systems in the firm (Frankwick et al. 1994; Moorman and Miner 1997), or the impact of functional thought worlds (e.g., Deshpandé and Zaltman 1984).

Our research also suggests there is an opportunity to examine the *interplay* between individual and collective levels of customer focus. Research has not examined this issue but instead, has tended to: (1) examine one level while ignoring the other; (2) focus on how activities or characteristics at one level (e.g., organizational structure) influence the development of knowledge at another level (Bontis, Crossan, and Hulland 2002; Dougherty 1990, 1992; Frankwick et al. 1994; Hutt, Reingen, and Ronchetto 1988); or (3) try to capture organizational knowledge by

aggregating or examining the intersection of individual manager beliefs (Bougon, Weick, and Binkhorst 1977; Klimonski and Mohammed 1994; Laukkanen 1994; Nelson and Mathews 1991; Walsh and Fahey 1986). Instead of trying to aggregate from the individual to the collective level, we examined how these unique levels of revenue emphasis influence one another, how they evolve, and how they work independently or jointly to influence firm performance.

Limitations

This research was limited primarily by its singular focus on knowledge. Future research could examine the role of knowledge relative to pure behavioral and artifactual elements of strategy that determine long-term firm performance (Homburg and Pflesser 2000). When validating our measures, we took care to link our knowledge focus to organizational processes that are more behavioral in nature. However, our approach is still primarily on the cognitive aspects of strategy. Cognitive activities were a good starting point on this broader path, given the important role that belief systems may have on the interpretations managers make and in guiding managers' actions.

Similarly, we chose to focus on customer focus related to one area of marketing—return on quality. There are obviously other areas beyond financial accountability in which customer focus may play an important role. Future research could replicate our results in areas such as new product development, service delivery, and supply chain management.

Our research is also limited by the fact that our sample does not represent a true probability sample of all organizations, because we created a sample of firms that are actively involved with evaluating returns from quality. Hence it is likely that this sample is more progressive than would be obtained from a simple random sample of firms (Rust, Moorman, and Dickson 2002). However, it is not clear what the value would be of studying firms that are not in the process of adopting the revenue process.

Finally, our firm performance measures asked respondents to evaluate their firm's performance relative to firm objectives. While this approach could be criticized on the grounds that performance evaluations are influenced by a firm's aspirations, research has found a very strong correspondence between our approach and evaluations relative to competition (Moorman 1995). Furthermore, because of the diversity of firms in our population, evaluations of performance relative to competition are likely to create other measurement problems not created by a firm-specific assessment. Using secondary data is possible. However, among the managers that survived surveys at time 1 and time 2 ($n = 74$), fewer than half of their firms were publicly held. This means that access to secondary information is limited and that statistical analysis would be underpowered.

Conclusion

Our paper takes an important step in the direction of addressing the location, evolution, and impact of a revenue emphasis toward return on quality in organizations. A longitudinal, within-subjects design coupled with tests of discriminant validity allowed us to address questions about the distinctiveness of individual-manager and collective revenue emphasis. It also permitted us to examine how these levels of revenue emphasis change over time, as well as the performance implications of revenue emphasis at both levels of the organization. This pattern of results advances the literatures in market orientation and service quality by providing insight into the location and evolution of revenue emphasis in firms and the performance implications of different locations. We hope these findings stimulate future research on other aspects of customer focus in firms. ■

Acknowledgements

This research was sponsored by a grant from the Marketing Science Institute, by Vanderbilt University's Center for Service Marketing, and by the A.C. Nielsen Center for Marketing

Research, University of Wisconsin-Madison. The authors thank Jim Bettman, Raji Srinivasan, Rob Tanner, and seminar participants at Penn State University, the University of Texas-Austin, Case Western Reserve, and the University of Maastricht for comments on

a previous version of the paper; Julie Edell and Rebecca Slotegraaf for their data-analysis assistance; and Holly Barr and William Mackinson for their data-collection assistance.

Appendix: Measures

(All questions use a 1 = Low, 4 = Moderate, 7 = High scale unless otherwise indicated)

Revenue Emphases

Collective Revenue Emphasis (Rust, Moorman, and Dickson 2002) (Collected twice, three years apart)
Rate the degree to which the managers in your division agree with the following statements about initiatives to improve the quality of products and processes.

- The purpose of quality improvements is to improve customer satisfaction/retention.
- Quality improvements should be differentiated by their impact on customer satisfaction/retention.
- It is best to invest in improving those quality initiatives that greatly increase customer satisfaction/retention.

Individual Revenue Emphasis (adapted from Rust, Moorman, and Dickson 2002) (Collected twice, three years apart)
Rate the degree to which you believe the following statements to be true about initiatives to improve the quality of products and processes.

- The purpose of quality improvements is to improve customer satisfaction/retention.
- Quality improvements should be differentiated by their impact on customer satisfaction/retention.
- It is best to invest in improving those quality initiatives that greatly increase customer satisfaction/retention.

Nomological Validity Variables

Organizational Experience in Evaluating Customer Satisfaction and Retention (New Item)
Rate the level of firm experience in: How to evaluate customer satisfaction/retention.

Individual Experience in Evaluating Customer Satisfaction and Retention (New Item)
Rate your own level of experience in: How to evaluate customer satisfaction/retention.

Marketing Functional Orientation (New Item)
Rate the functional area your job is most affiliated with.
Coded marketing = 1, else = 0

Variables Impacting Convergence of Individual and Collective Revenue Emphases

Organizational Processes for Using Quality Information (adapted from Moorman 1995)

Rate your division's processes for using information that ties quality initiatives to financial outcomes. To what extent does your division have processes (either formal or informal):

- Which summarize this information, reducing its complexity.
- That encourages decision makers to disagree and to challenge each other about this information.
- Which encourage managers to develop predictions using this information.
- For analyzing this information in meaningful ways.
- For using this information to evaluate various marketing strategy alternatives.

Cross-functional Customer-Financial Linkages (Moorman and Rust 1999)

Rate marketing's role in quality improvements (1 = strongly disagree, 7 = strongly agree).

- Marketing is effective at linking customer satisfaction/retention to financial outcomes.
- I would be willing to rely on marketing to link customer satisfaction/retention to financial outcomes.
- My division's ability to link customer satisfaction/retention to financial outcomes resides in marketing.

Origin of Quality Innovation (New Item)

Check only one space below to reflect the source of the original development of the system your division uses to link quality initiatives to financial outcomes (Internal = 1, 2, 3 and external = 4, 5, 6).

(1) Within my department, (2) Within my division, (3) Within my firm, (4) Outside my firm (developed by a consultant), (5) Outside my firm (developed by a competitor), and (6) Outside my firm.

Organizational Service Orientation (Rust, Moorman, and Dickson 2002)

Evaluate your division's operations on the following scale (7-point scale, 1 = producing goods, 7 = providing services).

Individual Manager Quality Experience Level (New Item)

Write in the number of hours per week you are involved in making decisions regarding information that links quality initiatives to financial outcomes.

Marketing Functional Orientation (New Item)

Rate the functional area your job is most affiliated with.
Coded marketing = 1, else = 0.

Firm Performance (Moorman and Rust 1999)

Collected three years following the original data collection.

Relative to your division's stated objectives, how is your division performing on: (1 = worse, 4 = on par, 7 = better)

Firm Financial Performance:

- Sales
- Profitability
- Market share

Firm Customer Relationship Performance:

- Customer satisfaction
- Customer retention
- Service quality

Firm New Product/Service Development Performance:

- Financial performance of new product/service development
- Speed of new product/service development
- Creativity of new product/service development

Control Variables Impacting Firm Performance

Environmental Turbulence: (Jaworski and Kohli 1993)

Use the scale at the top of the page to rate your division's operating environment (1 = strongly disagree, 4 = uncertain, and 7 = strongly agree).

- In our kind of business, customers' product/service preferences change quite a bit over time
- New customers tend to have needs that are different

from our existing customers.

- We cater to many of the same customers that we have in the past.
- Competition in this product/service area is very cut-throat.
- One hears of a new competitive move in this product/service area almost every day.
- Our competitors in this product/service area are relatively weak.
- The technology in this product/service area is changing rapidly.
- Technological changes provide big opportunities in this product/service area.
- Technological developments in this product/service area are rather minor.

Individual Performance (Rust, Moorman, and Dickson 2002)

Use the scale at the top of the page to rate your individual performance (1 = strongly disagree, 4 = uncertain, and 7 = strongly agree).

- I have generally performed better than my peers in comparable jobs.
- I am more effective in my job than my peers.
- I have been promoted at a faster rate than my peers.

Notes

1. This sampling method and procedure is the one used by Rust, Moorman, and Dickson (2002). The two papers also share collective, time 1 revenue emphasis measures.

2. Confirmatory factor analysis was performed only for multi-item measures. These measures included: Organizational processes for using quality information, t1 vs. collective revenue emphasis, t1 ($\chi^2_{(1)} = 12.8$); cross-functional linkages, t1 vs. collective revenue emphasis, t1 ($\chi^2_{(1)} = 27.5$); firm financial performance, t2 vs. firm customer relationship performance, t2 ($\chi^2_{(1)} = 29.8$); firm financial performance, t2 vs. firm product/service development performance, t2 ($\chi^2_{(1)} = 16.7$); firm customer relationship performance, t2 vs. firm product/service development performance, t2 ($\chi^2_{(1)} = 31.7$); individual revenue emphasis, t1 vs. firm financial performance, t2 ($\chi^2_{(1)} = 33.1$); individual revenue emphasis, t1 vs. firm customer relationship performance, t2 ($\chi^2_{(1)} = 72.9$); individual revenue emphasis, t1 vs. firm product development performance, t2 ($\chi^2_{(1)} = 31.3$); collective revenue emphasis, t1 vs. firm financial performance ($\chi^2_{(1)} = 23.0$); collective revenue emphasis, t1 vs. firm customer relationship performance, t2 ($\chi^2_{(1)} = 49.5$); and collective revenue emphasis, t1 vs. firm product/service development performance, t2 ($\chi^2_{(1)} = 32.7$).

3. All measures examined in the nomological net were operationalized within the context of return on quality programs. Single-item measures were used for each factor in the net because the domain is straightforward and multiple items would not provide much advantage (Drolet and Morrison 2001).

4. First, environmental turbulence was included because it could influence both learning and performance. Three types of turbulence were assessed and combined into a single scale (market turbulence, technological turbulence, and competitive intensity; $\alpha = .76$, $M = 4.73$, $s.d. = .91$). Individual forms of turbulence were not utilized, to save parameters and because the impact of the environment was not of theoretical interest to the study. Second, individual manager's performance at time 1 was included because it could inflate firm estimates of performance and knowledge ratings. This three-item measure asked the reporting manager to rate his/her performance ($\alpha = .76$, $M = 5.21$, $s.d. = .92$). Third, we included all factors known to influence the gap between individual and collective knowledge over time (see H4a–H4e results), including organizational processes for using quality information, origin of the quality innovation, organizational service orientation, cross-functional linkages, and individual manager marketing functional orientation. Finally, we included firm size as measured by the number of employees to control for the well-known effects of size on performance.

References

- Aiken, Leona S., and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*. New York, N.Y.: Sage.
- Argote, Linda (1999), *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Boston, Mass.: Kluwer Academic Publishers.
- Argote, Linda, and Paul Ingram (2000), "Knowledge Transfer: A Basis for Competitive Advantage in Firms." *Organizational Behavior and Human Decision Processes* 82 (May), 150–69.
- Argote, Linda, Paul Ingram, John M. Levine, and Richard Moreland (2000), "Knowledge Transfer in Organizations: Learning from the Experience of Others." *Organizational Behavior and Human Decision Processes* 82 (May), 1–8.
- Axelrod, R. (1976), *The Structure of Decision: The Cognitive Maps of Political Elites*. Princeton, N.J.: Princeton University Press.
- Barr, Pamela S. (1998), "Adapting to Environmental Events: A Look at the Evolution of Interpretation and Its Role in Strategic Change." *Organization Science* 9 (November–December), 644–69.
- Bartunek, Jean M. (1984), "Changing Interpretive Schemes and Organizational Restructuring: The Example of a Religious Order." *Administrative Science Quarterly* 29 (September), 355–72.
- Bettman, James R., and Barton A. Weitz (1983), "Attributions in the Board Room: Causal Reasoning in Corporate Annual Reports." *Administrative Science Quarterly* 28 (June), 165–83.
- Bontis, Nick, Mary M. Crossan, and John Hulland (2002), "Managing an Organizational Learning System by Aligning Stocks and Flows of Knowledge." *Journal of Management Studies* 39 (June), 437–70.
- Bougon, Michel, Karl Weick, and Din Binkhorst (1977), "Cognition in Organizations: An Analysis of the Utrecht Jazz Orchestra." *Administrative Science Quarterly* 22 (December), 606–39.
- Campbell, Donald T. (1955), "The Informant in Quantitative Research." *American Journal of Sociology* 60 (January), 339–42.
- Cohen, Wesley M., and Daniel A. Levinthal (1990), "Absorptive Capacity: A New Perspective on Learning and Innovation." *Administrative Science Quarterly* 35 (September), 128–52.
- Cronbach, Lee J., and Paul E. Meehl (1955), "Construct Validity in Psychological Tests." *Psychological Bulletin* 52 (July), 281–302.
- Crosby, Philip B. (1979), *Quality Is Free*. New York, N.Y.: McGraw-Hill.
- Crossan, Mary M., Henry W. Lane, and Roderick E. White (1999), "An Organizational Learning Framework: From Intuition to Institution." *Academy of Management Review* 24 (3), 522–37.
- Cyert, Richard M., and James G. March (1992, 1963), *A Behavioral Theory of the Firm*. Englewood Cliffs, N.J.: Prentice-Hall.
- Daft, Richard M., and Karl E. Weick (1984), "Toward a Model of Organizations as Interpretation Systems." *Academy of Management Review* 9 (April), 284–95.
- Day, George S. (1994), "The Capabilities of Market-Driven Organizations." *Journal of Marketing* 58 (October), 37–52.
- Day, George S., and David B. Montgomery (1983), "Diagnosing the Experience Curve." *Journal of Marketing* 47 (Spring), 44–59.
- Day, George S., and Prakash Nedungadi (1994), "Managerial Representations of Competitive Advantage." *Journal of Marketing* 58 (April), 31–44.
- Deshpandé, Rohit, John U. Farley, and Frederick E. Webster, Jr. (1993), "Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: A Quadrad Analysis." *Journal of Marketing* 57 (January), 23–37.
- Deshpandé, Rohit, and Frederick E. Webster, Jr. (1989), "Organizational Culture and Marketing: Defining the Research Agenda." *Journal of Marketing* 53 (January), 3–15.
- Deshpandé, Rohit, and Gerald Zaltman (1982), "Factors Affecting the Use of Market Research Information: A Path Analysis." *Journal of Marketing Research* 19 (February), 14–31.
- Deshpandé, Rohit, and Gerald Zaltman (1984), "A Comparison of Factors Affecting Researcher and Manager Perceptions of Market Research Use." *Journal of Marketing Research* 21 (February), 32–8.
- Dess, Gregory G., and Richard B. Robinson, Jr. (1984), "Measuring Organizational Performance in the Absence of Objective Measures: The Case of the Privately-Held Firm and Conglomerate Business Unit." *Strategic Management Journal* 5 (3), 265–73.
- Dickson, Peter R. (2003), "The Pigeon Breeders' Cup: A Selection on Selection Theory of Economic Evolution." *Journal of Evolutionary Economics* 13, 259–80.
- Dickson, Peter R., Paul W. Farris, and Willem J.M.I. Verbeke (2001), "Dynamic Strategic Thinking." *Journal of the Academy of Marketing Science* 29 (3), 216–37.

- Dougherty, Deborah (1990), "Understanding New Markets for New Products." *Strategic Management Journal* 11 (Summer), 59–78.
- Dougherty, Deborah (1992), "Interpretive Barriers to Successful Product Innovation in Large Firms." *Organizational Science* 3 (May), 179–202.
- Drolet, Aimee L., and Donald G. Morrison (2001), "Do We Really Need Multiple-Item Measures in Service Research?" *Journal of Service Research* 3 (3), 196–204.
- Durkheim, Emile (1938), *The Rules of Sociological Method*. New York, N.Y.: The Free Press.
- Fiol, C. Marlene (1994), "Consensus, Diversity, and Learning in Organizations." *Organization Science* 5 (August), 403–20.
- Frankwick, Gary L., James C. Ward, Michael D. Hutt, and Peter H. Reingen (1994), "Evolving Patterns in Organizational Beliefs in the Formation of Strategy." *Journal of Marketing* 58 (April), 96–110.
- Gatignon, Hubert, and Jean-Marc Xuereb (1997), "Strategic Orientation of the Firm and New Product Performance." *Journal of Marketing Research* 34 (February), 77–90.
- Glynn, Mary Ann (1996), "Innovative Genius: A Framework for Relating Individual and Organizational Intelligences to Innovation." *Academy of Management Review* 21 (4), 1081–1111.
- Granovetter, Mark (1985), "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91 (November), 481–510.
- Grant, Robert M. (1996), "Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration." *Organization Science* 7 (July-August), 375–87.
- Griffin, Abbie, and John R. Hauser (1992), "Patterns of Communication Among Marketing, Engineering, and Manufacturing – A Comparison Between Two New Product Teams." *Management Science* 38 (March), 360–73.
- Heide, Jan B., and George John (1995), "Measurement Issues in Research on Interfirm Relationships." In *Business Marketing: An Interaction and Network Perspective*, eds. Kristian Möller and David Wilson, 531–54, Boston, Mass.: Kluwer Academic Publishers.
- Heskett, James L., Thomas O. Jones, Gary W. Loveman, and W. Earl Sasser (1994), "Putting the Service Profit Chain to Work." *Harvard Business Review* 72 (March-April), 164–74.
- Homburg, Christian, and Christian Pflesser (2000), "A Multiple-Layer Model of Market-Oriented Organizational Culture: Measurement Issues and Performance Outcomes." *Journal of Marketing Research* 37 (4), 449–62.
- Hu, Michael, Rex S. Toh, and Eunhyu Lee (1996), "Impact of Level of Aggregation on Response Accuracy in Surveys of Behavioral Frequency." *Marketing Letters* 7 (October), 371–82.
- Huber, George P. (1991), "Organizational Learning: The Contributing Processes and the Literatures." *Organizational Science* 2 (February), 88–115.
- Hutchins, Edwin (1991), "Organizing Work by Adaptation." *Organization Science* 2 (February), 14–39.
- Hutt, Michael D., Peter H. Reingen, and John R. Ronchetto, Jr. (1988), "Tracing Emergent Processes in Marketing Strategy Formation." *Journal of Marketing* 52 (January), 4–19.
- Jaworski, Bernard J., and Ajay K. Kohli (1993), "Market Orientation: Antecedents and Consequences." *Journal of Marketing* 57 (July), 53–70.
- Johnson, Michael D., and Anders Gustafsson (2000), *Improving Customer Satisfaction, Loyalty, and Profit*. San Francisco, Calif.: Jossey-Bass.
- Kamakura, Wagner A., Vikas Mittal, Fernando de Rosa, and José Alfonso Mazzon (2002), "Assessing the Service Profit Chain." *Marketing Science* 21 (3), 294–317.
- Katz, Ralph, and Thomas J. Allen (1982), "Investigating the Not Invented Here (NIH) Syndrome: A Look at the Performance, Tenure, and Communication Patterns of 50 R&D Project Groups." *Research and Development Management* 12 (1), 7–20.
- Klimonski, Richard, and Susan Mohammed (1994), "Team Mental Model: Construct or Metaphor?" *Journal of Management* 20 (2), 403–37.
- Kohli, Ajay K., and Bernard J. Jaworski (1990), "Market Orientation: The Construct, Research Propositions, and Managerial Implications." *Journal of Marketing* 54 (April), 1–18.
- Kruger, Justin (1999), "Lake Wobegon Be Gone! The 'Below-Average Effect' and the Egocentric Nature of Comparative Ability Judgments." *Journal of Personality and Social Psychology* 77 (2), 221–32.
- Langfield-Smith, K. (1992), "Exploring the Need for a Shared Cognitive Map." *Journal of Management Studies* 29 (May), 349–68.
- Laukkanen, Maury (1994), "Comparative Cause Mapping of Organizational Cognitions." *Organization Science* 5 (August), 322–43.
- Leonard-Barton, Dorothy (1992), "Core Capabilities and

- Core Rigidities: A Paradox in Managing New Product Development." *Strategic Management Journal* 13 (Summer), 111–25.
- Leonard-Barton, Dorothy (1995), *Wellsprings of Knowledge*. Boston, Mass.: Harvard Business School Press.
- Levinthal, Daniel A., and James G. March (1993), "The Myopia of Learning." *Strategic Management Journal* 14, 95–112.
- Levitt, Barbara, and James G. March (1988), "Organizational Learning." *Annual Review of Sociology* 14, 319–40.
- Lyles, Majorie A., and Charles R. Schwenk (1992), "Top Management, Strategy and Organizational Knowledge Structures." *Journal of Management Studies* 29 (March), 155–74.
- March, James G. (1991), "Exploration and Exploitation in Organizational Learning." *Organization Science* 2 (February), 71–87.
- Meindl, James R., Charles Stubbart, and Joseph F. Porac (1994), "Cognition Within and Between Organizations: Five Key Questions." *Organization Science* 5 (3), 289–93.
- Miles, R. E., and Charles C. Snow (1978), *Organizational Strategy, Structure and Process*. New York, N.Y.: McGraw-Hill.
- Miner, Anne S. (1989), "Structural Evolution Through Idiosyncratic Jobs: The Potential for Unplanned Learning." *Organization Science* 1, 195–210.
- Moorman, Christine (1995), "Organizational Market Information Processes: Cultural Antecedents and New Product Outcomes." *Journal of Marketing Research* 32 (August), 318–35.
- Moorman, Christine, and Anne S. Miner (1997), "The Impact of Organizational Memory on New Product Performance and Creativity." *Journal of Marketing Research* 34 (February), 91–106.
- Moorman, Christine, and Roland T. Rust (1999), "The Role of Marketing." *Journal of Marketing* 63 (Special Issue), 180–97.
- MSI (2002), *2002–2004 Research Priorities*. Cambridge, Mass.: Marketing Science Institute.
- Narver, John C., and Stanley F. Slater (1990), "The Effect of a Market Orientation on Business Profitability." *Journal of Marketing* 20 (October), 20–35.
- Nelson, Reed E., and K. Michael Mathews (1991), "The Use of Cause Maps and Social Network Analysis in Organizational Diagnosis." *Journal of Applied Behavioral Science* 27 (September), 379–97.
- Nonaka, Ikujiro, and Hirotaka Takeuchi (1995), *The Knowledge-Creating Company*. New York, N.Y.: Oxford University Press.
- Ofek, Elie, and V. Srinivasan (2002), "How Much Does the Market Value an Improvement in a Product Attribute?" *Marketing Science* 21 (4), 398–411.
- Peter, J. Paul (1981), "Construct Validity: A Review of Basic Issues and Marketing Practices." *Journal of Marketing Research* 18 (May), 133–45.
- Porac, Joseph, James R. Meindl, and Charles Stubbart (1996), "Introduction." In *Cognition Within and Between Organizations*, ix–xxiii, Thousand Oaks, Calif.: Sage Publications.
- Rosa, José, Joseph Porac, Jelena Runser-Spanjol, and Michael Saxton (1999), "Sociocognitive Dynamics in a Product Market." *Journal of Marketing* 63 (Special Issue), 64–77.
- Rust, Roland T., Katherine N. Lemon, and Valarie A. Zeithaml (2004), "Return on Marketing: Using Customer Equity to Focus Marketing Strategy." *Journal of Marketing* 68 (January), 109–27.
- Rust, Roland T., Christine Moorman, and Peter R. Dickson (2002), "Getting Returns from Quality: Revenue Expansion, Cost Reduction, or Both?" *Journal of Marketing* 66 (October), 7–24.
- Rust, Roland T., Anthony J. Zahorik, and Timothy L. Keiningham (1995), "Return on Quality (ROQ): Making Service Quality Financially Accountable." *Journal of Marketing* 59 (April), 58–70.
- Sandelands, Lloyd E., and Ralph E. Stablein (1987), "The Concept of Organization Mind." In *Research in the Sociology of Organizations*, vol. 5, ed. Samuel B. Bacharach, 135–61. Greenwich, Conn.: JAI Press.
- Sinkula, James M. (1994), "Market Information Processing and Organizational Learning." *Journal of Marketing* 58 (January), 35–45.
- Slater, Stanley F., and John C. Narver (1995), "Market Orientation and the Learning Organization." *Journal of Marketing* 59 (July), 63–74.
- Spender, J.C., and Robert M. Grant (1996), "Knowledge and the Firm: Overview." *Strategic Management Journal* 17 (Winter Special Issue), 5–9.
- Srivastava, Rajendra K., Tasadduq A. Shervani, and Liam Fahey (1998), "Market-Based Assets and Shareholder Value: A Framework for Analysis." *Journal of Marketing* 62 (January), 2–18.
- Walsh, James P. (1988), "Selectivity and Selective Perception: An Investigation of Managers' Belief Structures and Information Processing." *Academy of*

Management Journal 31 (4), 873–96.

Walsh, James P. (1995), “Managerial and Organizational Cognition: Notes from a Trip Down Memory Lane.” *Organization Science* 6 (May-June), 280–320.

Walsh, James P., and Liam Fahey (1986), “The Role of Negotiated Belief Structures in Strategy Making.” *Journal of Management* 12 (3), 325–38.

Walsh, James P., and Gerardo Ungson (1991), “Organizational Memory.” *Academy of Management Review* 16 (1), 57–91.

Weick, Karl E. (1979), *The Social Psychology of Organizing*. Reading, Mass.: Addison-Wesley.

Weick, Karl E. (1995), *Sensemaking in Organizations*. Thousand Oaks, Calif.: Sage Publications.

Weick, Karl E., and Karlene H. Roberts (1993), “Collective Mind in Organizations: Heedful Interrelating on Flight Decks.” *Administrative Science Quarterly* 38, 357–81.

Report No. 04-107

“The Managerial Path to Return on Quality: How Individual and Collective Belief Systems Evolve in Firms”
© 2004 Christine Moorman, Roland T. Rust, and Peter R. Dickson; Report Summary © 2004 Marketing Science Institute