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ALEC LEVENSON

SUSAN COHEN

Center for Effective Organizations
Marshall School of Business
University of Southern California

WIM A. VAN DER STEDE

Leventhal School of Accounting
Marshall School of Business
University of Southern California

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ALEC LEVENSON
Center for Effective Organizations
Marshall School of Business
University of Southern California
3670 Trousdale Parkway, BRI-204
Los Angeles, CA 90089-0806
213-821-1095
213-740-4354 fax
alevenson@marshall.usc.edu

WIM A. VAN DER STEDE
Leventhal School of Accounting
Marshall School of Business
University of Southern California
Los Angeles, CA 90089-0441
213-740-3583
213-747-2815 fax
wim@marshall.usc.edu

SUSAN COHEN
Center for Effective Organizations
Marshall School of Business
University of Southern California
3670 Trousdale Parkway, BRI-204
Los Angeles, CA 90089-0806
213-740-9814
213-740-4354 fax
scohen@marshall.usc.edu

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Abstract

The use of competency systems to evaluate, reward, and promote managers has become commonplace in large organizations in recent years. Yet despite their popularity, there is scant evidence that competency systems increase managerial effectiveness and improve organizational performance. We first analyze the individual-level determinants of progression within a competency system and the links of the system with individual managerial performance. We then examine whether the prevalence of managers who have progressed within a competency system is related to improved organizational unit-level results. The results indicate that managerial competency systems can contribute to organizational performance.

The extensive research on managerial competencies almost exclusively emphasizes identifying the individual attributes and behaviors of effective leaders to evaluate other potential leaders (Briscoe & Hall, 1999). However, rarely are the competencies validated through the subsequent performance of those potential leaders. Critics thus conclude that competency systems often are ill conceived, designed, and executed (e.g., Hollenbeck & McCall, 2003).

In this study, we contribute to the debate by viewing competency systems from an organizational, not just individual, perspective. We first make predictions about individual competency attainment using expectancy theory (Vroom, 1964), emphasizing the organizational conditions needed to promote competency progression and the role of individual human capital. Our first test of the relevance of competency systems consists of examining the association between competency progression and individual performance ratings.

Given the inherent difficulties in translating individual performance into organizational performance (DeNisi, 2000; Schneider, Smith, & Sipe, 2000), we next examine the relationship between competency system characteristics and effectiveness at the organizational unit level. Theory predicts that systematic differences in HR practices across locations should produce observable differences in performance. Thus, HR practices that more effectively promote the development of critical managerial competencies should produce better unit-level performance (Lado & Wilson, 1994). Our data allow a test of this conjecture by examining a competency system's impact on organizational performance across various sites of one large organization.

The Debate over Managerial Competencies

The debate over using competencies to evaluate employees originates at least half a century ago. The early researchers critiqued the validity of standardized tests and other approaches unrelated to job design to evaluate job fit (McClelland, Baldwin, Bronfenbrenner, &

Strodtbeck, 1958; McClelland, 1973). They instead advocated using job requirements and behaviors of successful incumbents (Spencer & Spencer, 1993). Competencies have been used to evaluate a broad spectrum of jobs (Spencer & Spencer, 1993).

Managerial jobs have been a main focus of competency advocates (Boyatzis, 1982; Zenger & Folkman, 2002). There is evidence that competency systems predict managerial success as measured by 360-degree or supervisor ratings (Spreitzer, McCall, & Mahoney, 1997; Goldstein, Yusko, & Nicolopoulos, 2001) career advancement (Bray, Campbell, & Grant, 1974; Dulewicz & Herbert, 1996), or individual performance (Russell, 2001). Assessment centers often play a key role in identifying such competencies (Spreitzer et al., 1997).

While competency systems *can* play a role in identifying successful managers, critics question whether competency systems *should* play such a role. One concern is that there are many different routes to managerial effectiveness, so models based on a single set of competencies can be misleading at best (Hollenbeck & McCall, 1999; McKenna, 2002). Second, most competency systems are static and thus susceptible to changing leadership requirements (Hollenbeck & McCall, 1997). Third, competency identification efforts often produce similar competencies across organizations (Zingheim, Ledford, & Schuster, 1996; Hollenbeck & McCall, 1997), which limits their ability to be a source of competitive advantage (Lawler, 2000).

Moreover, competency often means "a fairly deep and enduring part of a person's personality" (Lawler, 2000, p. 136). This leads to critiques such as Drucker's (1966, pp. 21-22):

> "According to Professor [Chris] Argyris, the 'successful' executive … has ten characteristics, among them 'High Frustration Tolerance,' understanding of the 'Laws of Competitive Warfare,' or that he 'Identifies with Groups.' … There are not too many people around with such personality traits, and no one has even

> known a way of acquiring them. Fortunately, I know many highly effective – and successful – executives who lack most, if not all, of Argyris' 'characteristics.' I also know quite a few who, though they answer Argyris' description, are singularly ineffectual."

The implication is that if competency systems incorporate personality traits, then they should not be used for development and rewards. Lawler argues instead to base competencies on "skills and knowledge that are observable and related to task performance" (Lawler, 2000, p. 137).

The literature on managerial competencies predominantly uses data collected by assessment centers and external evaluators. The literature has not addressed the difference between externally-assessed competencies and internally-administered competency systems because of an almost-exclusive focus on the former. However, there likely are differences in the competencies from external and internal assessments. For example, Zingheim et al. (1996) found customer focus to be common in a sample of ten companies. In contrast, this competency does not appear in the assessment center systems examined by Bray et al. (1974) and Goldstein et al. (2001). Similarly, assessment center-rated communication skills might represent differences in communication style that are unrelated to effective communication on the job.

Internally-administered competency systems appear often to be used for performance management and determining rewards and promotions. For example, Lawler and McDermott's (2003) survey found that competencies are part of performance management systems to a "great" or "very great" extent at 48 percent of the companies they surveyed. Only 15 percent indicated "little or no" role for competencies in performance management. Despite the apparent prevalence of using internally-administered competency systems for performance management and rewards, the academic literature has yet to produce systematic evidence on their effectiveness.

Hypotheses

We use expectancy theory (Vroom, 1964) to examine the factors that motivate managers to develop and demonstrate competencies. Expectancy theory argues that motivation is a function of valence (the value of acquiring and demonstrating competencies), instrumentality (clarity of the competencies-performance link), and expectancy (perceived probability of success). A key insight from expectancy theory is that people are not naturally productive or driven to achieve organizational goals; incentives must tie rewards to performance (Lawler, 1973).

Competency systems typically consist of many dimensions, making them complex to administer. Linking competency systems to performance management and rewards increases complexity even further. Thus there may be confusion regarding how to demonstrate the competencies, and how competency demonstration impacts rewards. Improved understanding of the competency system should increase instrumentality, thus increasing effort and competency.

H1: The degree of understanding regarding a competency system is positively related to attaining and demonstrating higher competency levels.

Evaluating and rewarding managerial competencies is subjective, which means that competencies may be measured and rated inaccurately. The people who rate the competencies of internally-administered systems are lay people (the manager's coworkers); external raters most often are experts in assessment and/or psychometric analysis. Thus internally-administered systems may have looser standards. Despite this, to our knowledge no previous research has focused on the fairness and consistency of internally-administered systems. Our prediction is that greater fairness and consistency should increase both instrumentality and expectancy.

H2: The fairness and consistency of a competency system is positively related to attaining and demonstrating higher competency levels.

Given a less-than-certain link between behaviors and performance, people undoubtedly look for multiple signals about which behaviors lead to successful performance. The more closely aligned the competency system is with other HR systems that address performance management and development, the greater the link between behaviors and performance and between behaviors and career advancement. Thus, when there is alignment managers receive these multiple signals and can more easily tie their actions desirable outcomes. This creates greater motivation to demonstrate the competencies. This reasoning is backed by the evidence from the literature on the impact of HR systems (Becker & Gerhart, 1996), which often shows a strong link between organizational impact and the degree of alignment among HR systems.

H3: Alignment of a competency system with other HR systems is positively related to attaining and demonstrating higher competency levels.

Mentoring on the competency system should enhance instrumentality by increasing perceptions of the effort-performance link. Supervisors typically play a role in deciding whether employees have demonstrated the competencies. Supervisors also often play dual roles as mentors (Lankau & Scandura, 2002). Thus supervisors influence employees' opportunities to develop and demonstrate competencies.

H4: Mentoring by supervisors on a competency system is positively related to attaining and demonstrating higher competency levels.

Even if competency systems predict individual managerial achievement, there is no guarantee that the systems improve organizational performance because individual performance does not necessarily aggregate to the organizational level (DeNisi, 2000; Schneider, et al., 2000). Consider the evidence on the impact of competency systems at the individual level. Better 360-degree or supervisor ratings (Spreitzer, et al., 1997; Goldstein, et al., 2001) or career

advancement (Bray, et al., 1974; Dulewicz & Herbert, 1996) at the individual manager level can occur in the absence of positive impacts on organizational performance if such ratings and promotions are not closely tied to metrics that directly impact the bottom line. This is more likely to be the case in larger business units, in highly matrixed organizations, and when managers have budget, not profit, goals. In each case there may be poor line of sight between individual performance and organizational impacts.

This is an important issue that has not been adequately addressed in the literature. To examine the organizational impact of competency systems we first test the link between competencies and individual performance (similar to Russell, 2001). We then test the link between competencies and organizational performance.

H5a: Competency systems can be used to identify and promote managers who achieve higher individual performance ratings.

H5b: Competency systems can be used to identify and promote managers who contribute disproportionately to improving organizational performance.

Methods

We studied a competency system at one company for two reasons. First, the literature on the impact of HR systems suggests that alignment with firm strategy can play an important role in determining effectiveness (Youndt et al., 1996). A multi-firm approach would have to control for both competency system characteristics and differential alignment of the system with strategy and HR systems across firms. Second, we want to focus on differences in site performance that can be influenced by managerial actions and abilities (i.e., competencies), and deemphasize the role of industry, production technology, and organization design.

Sample

The data come from a major division of a *Fortune 500* consumer products company. The competency system was introduced ten years prior to the study to promote a more inclusive management style through enhanced teamwork and knowledge sharing. The division also wanted middle manager development with minimal job changes. The previous compensation system was tied directly to jobs; promotions were achieved via job- and site-hopping. This hindered the creation of a cohesive team of managers at a site. The company introduced the competency system and a broadband pay system to enable managerial advancement without role changes.

The competency system has three levels. Advancement is rewarded by a salary increase and the opportunity for larger bonuses based both on individual performance and group performance. The competency review process is separate from performance appraisal.

Individual data

A web-based survey of first line and middle managers was conducted in 2002 to assess, managers' understanding of the competency system and its alignment with other HR systems, and the perceived impact on skill development and performance. It was administered to 1,279 managers and matched with individual archival data on competency and performance ratings. Valid surveys were received from 807 respondents, for an effective response rate of 63 percent.

Site data

The site-level archival data used to test impacts at an organizational level are drawn from 52 manufacturing plants and distribution centers operated by the division in the United States.

Research Design

We conduct the empirical analysis at two levels. First we use the individual-level data to analyze the determinants of progression in the competency system, using ordered probit analysis:

COMPETENCY LEVEL = *f*(understanding, fairness and consistency, alignment, mentoring, human capital control variables)

Second, we test the link between competency level and individual performance ratings, using regression analysis:

INDIVIDUAL PERFORMANCE RATING = *g*(competency level, human capital control variables)

Third, we analyze the link between the competency system and site-level performance. This requires creating site-level measures that best reflect the expected impact of the competency system on organizational performance. The demarcation of managerial performance implicit in the different levels of the competency system provides a suitable measure: the percentage of managers at the intermediate and at the advanced competency levels. Comparing two managers with equal performance ratings, the one who is higher ranked in the competency system should provide a larger net positive impact on the organization's bottom line than the manager who is lower ranked. Thus, a site with a greater proportion of managers at the intermediate or advanced levels should have more managers who improve the performance of their peers and the site.

When predicting site performance we consider separately the roles of managers at the intermediate versus advanced competency levels because of the nature of promotions in this particular firm. It typically takes 3-5 years for promotion from the beginning to intermediate level, and another 4-6 years for promotion from the intermediate to advanced level. But managers do not have to be at the advanced competency level to be promoted out of the broadband: "superstar" managers often are promoted directly from the intermediate level to more senior leadership positions, bypassing the upper level of the broadband. While managers at the advanced level of the competency system are supposed to have a greater impact site-wide than

those at the intermediate level, a significant fraction of the intermediate-level managers are on trajectories of performance and promotion that will lead them to surpass the advanced-level managers. The pool of advanced managers, in contrast, contains a much greater proportion of managers who will advance no farther in the organization. Consequently, the net impact on site performance from substituting an advanced-level versus intermediate-level manager for a beginning-level manager is an empirical question.

The following regression is used to test the site-level hypothesis:

SITE PERFORMANCE = *h*(proportion of managers at intermediate competency level, proportion of managers at advanced competency level)

For the individual-level analysis we use the survey data and archival data on individual performance ratings. For the site-level analysis we use only archival data: the aggregated statistics on the competency system and managerial performance ratings are calculated using the entire population of managers at each site, not just those who responded to the survey. This ensures that the site-level analysis is not biased by unrepresentative response rates across sites.

Measures

Managerial competence level. The competency system's three overall levels are beginning, intermediate, and advanced. There are three categories of competence, and within each category there are multiple dimensions: (a) basic management skills (e.g., designing strategic plans; addressing job performance among direct reports; addressing customer needs); (b) basic leadership skills (e.g., communication; accomplishing objectives through influence; networking with peers; mentoring and developing others); and (c) technical/functional skills (e.g., technical expertise; functional/business expertise; developing technical and business expertise in others). There are separate guidelines for beginning, intermediate, and advanced for

each individual dimension within each category. For example, within the leadership category, the beginning level includes "communicates point of view to win support of others;" the intermediate level includes "addresses groups and/or cross-functional groups effectively to communicate information and win the support of others;" and the advanced level includes "influences individuals at all levels to affect the direction of the organization." Going from the beginning to the intermediate and then the advanced levels means the managers' actions have impacts further beyond their span of immediate control, and throughout the entire site.

Promotion to the intermediate level requires mastery of at least 75 percent of the competency dimensions in each intermediate level category; the same holds for promotion to the advanced level. This homogeneity of competency mastery means that overall competency level (beginning, intermediate, advanced) is close to a sufficient statistic for competency mastery across the variety of individual dimensions within each category.

New managers are given a grace period of no more than two years before they must demonstrate the competency system's basic skills level. Failure to demonstrate mastery at the beginning level can lead to termination. Promotion to the intermediate competency level is expected as part of the manager's ongoing development, though it is not guaranteed and there is no set timeline. Promotion to the advanced level is encouraged but not expected. Promotion decisions are based on calibration of the manager's performance relative to the competency dimensions and the manager's peer's performance at the site and in the region. Calibration at a site is used more often for promotions to intermediate level at large sites; calibration across sites (within a region) is used more often for promotions to intermediate level at small sites, and for all promotions to advanced level. Each region typically includes 4-6 sites.

Understanding of the competency system. A three-item scale: (a) I have a real understanding of how the competency system works; (b) I understand the criteria used to determine movement from <beginning> to <intermediate> to <advanced> level; and (c) I understand how <managers> can get a promotion under the competency system. (The survey wording used the company's names for the competency levels, which we omit here for purposes of confidentiality.) The seven anchors for this scale are strongly disagree (=1), disagree (=2), slightly disagree (=3), neither agree nor disagree (=4), slightly agree (=5), agree (=6), and strongly agree (=7). The scale has an alpha of .81, and is a variant of the scale used by Ledford & Bergel (1991) and by Ledford, Tyler, & Dixey (1991). In addition, we also analyze whether receiving training on how the competency system is administered – another measure of understanding – is related to competency progression.

Fairness and consistency of the competency system. A three-item scale: (a) it seems that the competency system is administered fairly; (b) people promoted to <intermediate> and <advanced> continue to demonstrate the relevant competencies; and (c) managers do not get promoted to <intermediate > or <advanced> unless they have really mastered that competency level. This scale uses the same seven anchors as the understanding scale, and has an alpha of .85.

Alignment of competency system with performance management and other systems. A three-item scale: (a) alignment of competency system with objective setting; (b) alignment of performance appraisal and competency system; and (c) alignment of competency system and formal development plans. The four anchors for this seven-point scale are strong misfit (=1), slight misfit (=3), slight fit (=5), and strong fit (=7). The scale has an alpha of .81 and is a variant of the scale used by Mohrman, Cohen, & Mohrman (1995).

Mentoring by supervisor. A four-item scale: (a) I have received good communication about how the competency system works from the manager to whom I report; (b) my manager and I regularly talk about what I need to do to progress in the competency system; (c) I get good feedback from my manager on where I stand in the competency system; and (d) my manager helps me develop plans to achieve the <skills> in the competency system. This scale uses the same seven anchors as the understanding scale. The scale has a .91 alpha for reliability.

We factor analyzed each scale separately and found only one factor. We factor analyzed all four scales together and found the above four factors with small cross-loadings.

Individual performance rating. Individual performance ratings address the managers' ability to meet current performance objectives, which are designed separately from the competency dimensions. The performance ratings directly determine the size of the manager's individual bonus and have an impact on the size of merit raise received each year.

Site performance. All of the sites produce similar products using related production technologies. An advantage of the site performance data is that it takes into account idiosyncrasies of technology, product mix, and other performance determinants beyond the direct control of the site management team. This means that sites expected to do better in terms of cost and quality metrics do not start with an automatic advantage in the site performance ratings. Rather, each site has its own set of stretch goals. The range of possible site performance scores is 0-200. The company conducts extensive benchmarking across all sites to identify best practices in both cost and quality improvements. The benchmarking also is used to calibrate the expected performance of a site – the baseline used to determine site performance.

Despite the potentially subjective nature of the score, there is a strong link between the score and critical metrics for the division's financial health. The site performance score com-

ponents are cost reduction goals, productivity goals (no defects, on-time delivery), and injury rate goals. Each component is normed relative to the site's technology and history. For example, sites at or below the desired threshold for injury rate can receive a top score if they maintain or reduce their injury rate. In contrast, sites above the desired threshold for injury rate can receive a top score only if they reduce their injury rate by a minimum amount. Each component is normed independently. The overall site score is a weighted average of the individual components.

Human capital control variables. In addition to the organizational variables that should predict competency progression, standard human capital variables – experience and education – (Becker, 1964) likely also predict competency attainment. We measure experience in two ways: (a) years of managerial experience prior to joining the company (general management experience); and (b) years of managerial experience at the company (specific management experience). We expect the first measure to be less strongly related to competency promotion, and the second to be more strongly related. Education is measured using three indicators: (a) some college education or an associate's degree, (b) bachelor's degree, or (c) graduate degree, with high school graduates serving as the base group. We also control for whether the person has a degree in engineering. This might be important in a manufacturing and distribution environment in which engineering skills can give insights into improving productivity.

Results

Table 1 reports the descriptive statistics at the individual level. Of the managers who responded to the survey, 34 percent are at the intermediate competency level, and an additional 12 percent are at the advanced level. Managers at the higher competency levels give higher ratings to mentoring by their supervisors, understanding of the competency system, fairness and consistency of the system, and alignment of the competency, performance management system,

and other HR systems. Managers at the highest competency level are slightly more likely to have a four-year degree or more education; however, they are less likely to have an engineering degree. The latter is probably due to a change in the hiring profile used by the company, which in recent years focused more on engineers. This can be seen by the greatest representation of engineers among those at the beginning competency level (19 percent).

TABLE 1
Individual level data descriptive statistics: Mean, [standard deviation]

	Whole sample	**By competency level**		
		Beginning	Intermediate	Advanced
Manager is at intermediate competency level (0.0-1.0 range)	**34.0%** [47.4%]	**0%**	**100%**	**0%**
Manager is at advanced competency level (0.0-1.0 range)	**11.6%** [32.0%]	**0%**	**0%**	**100%**
Mentoring by supervisor (1-7 range)	**4.3** [1.5]	**4.0** [1.5]	**4.4** [1.5]	**5.0** [1.3]
Understanding of competency system (1-7 range)	**5.2** [1.2]	**4.9** [1.2]	**5.4** [1.1]	**6.0** [0.8]
Fairness and consistency of competency system (1-7 range)	**4.3** [1.4]	**4.1** [1.4]	**4.4** [1.3]	**4.9** [1.2]
Alignment of competency, performance and other HR systems (1-7 range)	**5.2** [1.2]	**5.1** [1.2]	**5.3** [1.1]	**5.6** [1.0]
Manager has some college education or AA degree (0.0-1.0 range)	**24.0%** [42.7%]	**23.9%** [42.7%]	**23.7%** [42.6%]	**25.0%** [43.5%]
Manager has Bachelors degree or higher (0.0-1.0 range)	**69.0%** [46.3%]	**69.1%** [46.2%]	**68.9%** [46.4%]	**68.5%** [46.7%]
Manager has degree in engineering (0.0-1.0 range)	**17.4%** [37.9%]	**19.0%** [39.3%]	**17.0%** [37.7%]	**10.9%** [31.3%]
Age (22-63 range)	**37.6 years** [8.6 years]	**35.1 years** [8.2 years]	**39.5 years** [8.0 years]	**43.3 years** [7.9 years]
Years of management experience at the division (0-40 range)	**6.3 years** [6.4 years]	**3.3 years** [3.7 years]	**8.5 years** [6.3 years]	**13.7 years** [7.7 years]

Years of prior management experience (0-35 range)	**4.9 years** [5.8 years]	**5.0 years** [5.8 years]	**5.0 years** [5.7 years]	**4.1 years** [5.6 years]
Performance rating (1-15 range)	**9.1** [1.9]	**8.6** [1.6]	**9.5** [1.9]	**9.8** [2.0]

It is not surprising that those at higher competency levels are older and have more years of management experience at the division. This is consistent with our interview evidence that it typically takes years to demonstrate the skills that lead to competency system advancement. More interesting, however, is the one year less prior management experience among those at the advanced competency level. This may indicate that prior management experience was less important in predicting advancement in the competency system, at least in the early years of the system: this group's average tenure of almost 14 years indicates that most already were working in the division when the competency system was instituted a decade earlier. Prior to instituting the competency system, the company may have had a greater tendency to promote from the ranks of the frontline workforce than to hire people with prior management experience.

Competency progression

Table 2 reports the results that predict attainment of higher competency levels. The first column shows the results from ordered probit estimation for predicting the three competency levels. The second and third columns show the results from estimating probits predicting advancement from beginning to intermediate and predicting advancement from intermediate to advanced, respectively. The second and third columns allow us to examine whether the effects in the pooled ordered probit results in the first column are uniform for predicting intermediate and advanced competency advancement.

TABLE 2
Attainment of Intermediate or Advanced Competency Level [a]

	Ordered probit: Competency promotions	Probit:[b] Promotion to intermediate	Probit:[c] Promotion to advanced
Understanding	**.236** **	**.059** *	**.126** **
	(.055)	(.024)	(.033)
Received one-day training on competency system	**.303** **	**.148** **	**-.031**
	(.100)	(.043)	(.053)
Fairness and consistency	**.114** *	**.044** *	**.031**
	(.045)	(.021)	(.022)
Alignment	**.056**	**.019**	**.005**
	(.046)	(.020)	(.024)
Mentoring	**.024**	**-.004**	**.022**
	(.042)	(.019)	(.020)
Education			
Some college	**.103**	**-.002**	**.113**
	(.201)	(.090)	(.122)
Bachelors degree	**.557** **	**.161** †	**.189** †
	(.192)	(.082)	(.093)
Masters degree or higher	**.704** **	**.163**	**.376** *
	(.224)	(.105)	(.157)
Engineering degree	**-.206**	**-.055**	**-.082**
	(.133)	(.056)	(.054)
Years of management experience at the division	**.132** **	**.056** **	**.023** **
	(.009)	(.005)	(.004)
Years of prior management experience	**.024** **	**.011** **	**-.000**
	(.009)	(.004)	(.004)
Pseudo R^2	.269	.255	.211
Number of observations	751	665	345

[a] Standard errors in parentheses
[b] D.V. = 1 if Intermediate; 0 if Beginning. [c] D.V. = 1 if Advanced, 0 if Intermediate
** $p < 0.01$
* $p < 0.05$
† $p < 0.10$

For the probit results, coefficient estimates are for changes in the probability of the dependent variable in response to a one-unit change in the independent variable. For the dichotomous education variables this corresponds to the difference in probability of being at the intermediate or advanced competency level (compared to someone with only a high school education).

The results support Hypothesis 1: both understanding and receiving training on the competency system are positively associated with attaining higher competency levels in the first column. The second and third columns in Table 2 show that competency system training is positively associated with attainment only of the intermediate competency level. This likely is because the training is targeted toward beginning level managers. In contrast, competency system understanding is much more positively associated with attainment of the advanced level.

The results in Table 2 also support Hypothesis 2: fairness and consistency of the competency system promote advancement. The impact is primarily in promotions to the intermediate level (second column). Hypotheses 3 and 4 are not supported: there is no statistically significant link between either alignment or mentoring and competency progression.

As expected, more education and experience are positively associated with competency progression. The impact is not uniform for the different types of competency promotion, however. Years of prior management experience predicts advancing from the beginning to the intermediate level; it has no impact on progression to the advanced level. Graduate education predicts advancement from intermediate to advanced, but not from beginning to intermediate.

Competencies and individual performance

The means in Table 1 indicate that managers at the higher competency levels on average have higher performance ratings. This might represent a halo effect, whereby those at the higher competency levels are perceived to be better performers even if they are not. This is explored in Table 3, which shows a broad range of performance ratings at each level, thus suggesting that the halo effect in assigning performance ratings does not significantly impede our inferences.

TABLE 3
Bivariate relationship of competency level and individual performance

	Competency level		
	Beginning	Intermediate	Advanced
Low performers	25.3%	15.2%	15.7%
Average performers	62.2%	50.6%	43.8%
High performers	12.5%	34.2%	40.5%
Total	100.0%	100.0%	100.0%

Table 4 examines whether competency level is just a proxy for human capital variables in predicting individual performance. Entered alone, the human capital variables have no association with performance rating (first column). When the competency levels are added in the second column, they reveal a strong positive and statistically significant relationship with performance rating. This is consistent with Hypothesis 5a. Doing so also leads the coefficients on the years of experience variables to become much more negative and statistically significant. This means that, within competency level, those with more years of experience tend to receive lower performance ratings. Opposite from a halo effect, this is consistent with top performers being concentrated at the earlier stages of each competency level, i.e., the top performers tend to move up more quickly within the competency system.

TABLE 4
Multivariate relationship of competency level and individual performance [a]

Intermediate competency level		1.270 **
		(.160)
Advanced competency level		1.926 **
		(.251)
Some college	-.297	-.359
	(.312)	(.295)
Bachelors degree	-.094	-.393
	(.300)	(.285)
Masters degree or higher	-.110	-.473
	(.346)	(.331)
Engineering degree	-.254	-.254
	(.200)	(.189)
Years of management experience division	-.007	-.076 **
	(.011)	(.013)
Years of prior management experience	-.019	-.028 *
	(.013)	(.012)
	9.44 **	9.47 **
Constant	(.305)	(.290)
R^2	.008	.117
Number of observations	692	692

[a] Standard errors in parentheses
D.V. = individual performance rating
** $p < 0.01$
* $p < 0.05$
† $p < 0.10$

Competencies and site performance

Table 5 reports the descriptive statistics at the site level by size of site. Note that the smaller sites have both higher site performance ratings and a larger fraction of managers at the advanced competency level, while having the lowest concentration of managers at the

intermediate competency level. The managers at larger sites, in contrast, receive slightly higher individual performance ratings.

TABLE 5
Site characteristics

	Smallest third	Middle third	Largest third
Site performance rating	90.7	87.6	84.1
Managers' average performance rating at site	7.74	7.66	7.98
Proportion of managers at intermediate level	.293	.321	.310
Proportion of managers at advanced level	.132	.095	.094
Number middle managers	8.5	21.9	44.9
Number of observations	17	18	17

One possibility is that the relationship between the competency system and site performance is not the same at sites of different size. Recall that the pool of intermediate level managers is supposed to contain a disproportionate number of "superstar" manages who eventually will be promoted to leadership positions. The lower representation of intermediate-level managers at the smaller sites might indicate a propensity for the superstars to transfer to other sites as part of their development because larger sites provide greater opportunity for job rotation. Smaller sites may also be much easier to manage, which in turn could explain their higher scores on average. To address these issues, we allow the relationship between the competency system and site performance to vary by site size in the multivariate analysis.

Table 6 reports the multivariate analysis of the relationship between the competency system and site performance. The first column contains the results when the fraction of managers at the intermediate level and the fraction at the advanced level are entered as standalone variables. There is no statistically significant relationship between these variables and site performance.

TABLE 6
Multivariate relationship of competency system and site performance [a]

Proportion of managers at intermediate level	**20.4** (25.7)		
Proportion of managers at advanced level	**-20.0** (37.2)		
Proportion of managers at intermediate level*smallest third of sites		**-26.1** (32.8)	**-42.5** (41.0)
Proportion of managers at advanced level*smallest third of sites		**-50.4** (44.7)	**-70.1** (53.6)
Proportion of managers at intermediate level*middle third of sites		**107.1** * (52.9)	**100.9** † (54.1)
Proportion of managers at advanced level*middle third of sites		**62.9** (90.1)	**77.3** (93.1)
Proportion of managers at intermediate level*largest third of sites		**92.6** (79.7)	**89.8** (80.3)
Proportion of managers at advanced level*largest third of sites		**-42.0** (129.8)	**-44.8** (130.7)
Site is in smallest third		**105.0** ** (14.3)	**97.2** ** (18.4)
Site is in Middle third		**47.3** † (23.8)	**32.8** (32.1)
Site is in largest third		**59.3** * (26.5)	**44.7** (34.3)
Mean individual performance rating of managers at the site			**1.97** (2.92)
Constant	83.4	-	-
R^2	.030	.946	.947

[a] Standard errors in parentheses
D.V. = site performance score; number of observations = 52
** $p < 0.01$
* $p < 0.05$
† $p < 0.10$

The second and third columns of Table 6 test whether the relationship between the competency system and unit-level performance is consistent across the different size ranges. In these columns the fractions of managers at the intermediate and advanced levels is interacted with indicators for the three tertiles of the site size distribution. Separate dummies variables for the site size tertiles are added as well (the constant is suppressed) to control for average differences in site performance that might be unrelated to the competency system.

The results in the second column indicate that there is a positive and statistically significant relationship between the proportion of intermediate-level managers at a site and the site's performance among the middle tertile of the site size distribution. The coefficient on the proportion of advanced-level managers for this tertile is also positive. However, the size of the coefficient is much smaller and its associated standard error is much larger. Thus there appears to be a much stronger impact on site performance of substituting a beginning-level manager for an intermediate-level manager – stronger than the impact of substituting for an advanced-level manager. This supports both Hypothesis 5b and the "superstar" conjecture.

To test the sensitivity of results in the second column, the third column adds the mean individual performance rating of the managers at the site. The concern is that higher competency ratings might simply proxy for higher performance ratings. If the competency system only measures managers' ability to meet immediate performance goals, we would expect individual performance ratings to moderate the relationship between competency ratings and site performance. The results in the third column show that this is not the case. Thus the competency ratings appear to measure an independent contribution of managerial ability to site performance. This is consistent with the competency system's emphasis on leadership styles that are supposed to enhance long-run site performance through developing employees and fostering self-managed

work teams, and through impacting peers' performance. The positive impacts of the competency system might thus elude measurement by the individually-focused performance management system, which considers only those elements under the manager's direct control.

A review of the estimates for the small and large sites in Table 6 reveals an interesting contrast. While the estimated competency system effects all are insignificant, the size of the coefficient for the proportion of managers at the intermediate level among the large sites is positive and close to that for the medium size sites. The estimate for the small sites, in contrast is negative. This further supports our interpretation that there appears to be something unique about the relationship between the competency system and site performance at the smaller sites.

Our final test of the sensitivity of the site-level results is provided in Table 7, which restricts estimation to the two thirds of the sites in the middle and large tertiles of the size distribution. The first column replicates the first column of Table 6. The results in Table 7 show a clear link between the fraction of a site's managers at the intermediate competency level and site performance. The second column adds the mean individual performance rating of managers at the site. The third column tries an alternate approach to controlling for individual performance ratings: the fractions of managers at the site with average individual performance ratings and with high individual performance ratings. Regardless of the method used to control for individual performance ratings, the outcome is the same: little to no impact on the estimated relationship between the competency system and site performance.

TABLE 7
Multivariate relationship of competency system and site performance: Medium and large sites [a]

Proportion managers at intermediate level	**93.3 *** (40.5)	**82.8** † (43.9)	**88.8 *** (43.0)
Proportion managers at advanced level	**27.4** (68.4)	**43.3** (73.1)	**38.9** (74.2)
Mean individual performance rating of managers at the site		**3.07** (4.68)	
Proportion of managers at the site with average individual performance rating			**15.7** (33.1)
Proportion of managers at the site with high individual performance rating			**-5.7** (42.4)
Constant	**53.9 **** (17.1)	**31.7** (38.0)	**48.0** † (25.3)
R^2	.152	.164	.160

[a] Standard errors in parentheses
D.V. = site performance score; number of observations = 35
** $p < 0.01$
* $p < 0.05$
† $p < 0.10$

Consider now the economic significance of the competency system via improved site performance. In Table 7, first column, the coefficient estimate on the fraction of managers at the intermediate competency level is 93.3 for the medium and large sites. Its mean is .315 (average for the medium and large sites), with a standard deviation of .11. Thus 11 percent more managers at the intermediate competency level is predicted to improve the site score by (.11) • (93.3) = 10.3 points, or about half a standard deviation in site performance (23.1). While this does not explain a majority of the difference in performance between sites, the senior leadership of the division views one half of a standard deviation improvement in site performance as significant. They

definitely consider such improvement well worth the time and energy to develop managers from basic to intermediate competency levels, on par with introducing new technologies or process improvements that cut costs or boost productivity.

Discussion

Our analysis of a middle manager competency system at a major division of a *Fortune 500* consumer products company revealed a positive relationship between attainment of higher competency levels and understanding of the competency system, training on the competency system, and fairness and consistency of the competency system. We found no link between competency progression and either alignment of the competency system with other HR systems or mentoring. We found a positive link between competency ratings and individual managerial performance ratings. At the site-level we found a positive link between the fraction of managers who are highly rated on the competency system and organizational performance. We thus conclude that competency systems can have a positive impact on organizational performance.

Our evidence does not, however, resolve the debate over the worth of using competency systems for managerial development, selection, and performance management. First, our results provide evidence of a positive relationship between a competency system and site-level performance. But they do not provide any evidence of the competency system's developmental impact. Our data cannot differentiate whether the competency system operates primarily by encouraging skill development, by allowing the company to select managers who are pre-disposed to develop into better leaders, or both. Even if there is a strong developmental impact whereby managers are motivated to focus on key skills that they otherwise might overlook, we cannot rule out the importance of developmental experiences in cultivating those skills.

The skills included in this company's competency system are indicative of those found in most competency systems, including managing through influence and empowering managers' direct reports. In many contexts such descriptors elicit skepticism from outside observers of the relevance of such skills for providing a competitive advantage (Lawler, 2000). In this setting, however, an argument can be made for that case. The division historically used a command-and-control management style. The introduction of the competency system coincided with a move to frontline work teams that were more self-managing in an effort to increase productivity and free up managerial time to focus on larger strategic objectives. In this context, demonstrating a more participatory and inclusive management style is a source of competitive advantage.

One feature of the competency system in this case is worth emphasizing: the spillover effect of managerial ability at higher competency levels. This feature ensures that managers are promoted within the competency system only if they are able to positively impact their peers' performance. It is conceivable that this contributes to the better performance of sites with greater concentrations of managers at the higher competency levels. It may also be related to our finding that there was no link between the fraction of high-competency managers and organizational performance at the small sites: sites may not be able to reap all the benefits of peer learning when the number of peers is small.

Peer learning as a system-wide design feature is not mentioned in any writings of either the supporters or critics of competency approaches, and thus suggests an innovative way to implement such systems. This logic is rooted in a long line of leadership research. Specifically, it has been recognized for some time that successful general managers network with their peers and accomplish objectives through influence (see Kotter, 1982, for example). Demonstrating such skills should improve both managers' own and their peer's performance. This competency

system provides a case study of the principle, in which managers are rewarded for demonstrating those behaviors.

We believe that we have provided evidence that competency systems can be used effectively to improve organizational performance. We look forward to future research that will shed further light on these issues.

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