Development and Content Validation of a "Hyperdimensional" Taxonomy of Managerial Competence

Robert P. Tett, Hal A. Guterman,
Angela Bleier, and Patrick J. Murphy

Department of Psychology
Wright State University

In light of repeated prescriptions for theory-driven prediction of job performance (Guion & Gottier, 1965; Tett, Jackson, Rothstein, & Reddon, 1999), the complexity of the manager's role calls for a comprehensive performance taxonomy more detailed than those offered previously. Review of recent discussion of the fidelity–bandwidth tradeoff (e.g., Hogan & Roberts, 1996; Ones & Viswesvaran, 1996) and the need for greater articulation of job performance (Campbell, 1994; Murphy & Shiarella, 1997) raise important issues regarding construct specificity in considering managerial behavior. None of 12 earlier managerial performance taxonomies (e.g., Borman & Brush, 1993; Tornow & Pinto, 1976; Yukl & Lepsinger, 1992) offers adequate specificity for meeting key research challenges. A "hyperdimensional" taxonomy of managerial competencies, derived from the earlier models and developed using unique methods, was subjected to content validation by expert review in 3 studies. In the first 2, a total of 110 Academy of Management members sorted 141 behavioral elements into 47 competencies with average hit rates of 68% and 85%, respectively. Results directed model refinements, including addition of 6 competencies. In Study 3, 118 subject matter experts sorted behaviors into targeted competencies in a more rigorous task with an average hit rate of 88.5%. Findings support the model's content validity, its continued development, and most importantly, the pursuit of specificity in understanding and predicting managerial behavior.

> The Scientific Mind—a mind nimble and versatile enough to catch the resemblances
> of things, which is the chief point, and at the same time steady enough to fix and dis-
> cern their subtle differences; endowed by nature with the desire to seek, patience to
> doubt, fondness to meditate, slowness to assert, readiness to reconsider, carefulness to
> set in order, and neither affecting what is new nor admiring what is old and hating
> every kind of imposture.
>
> Francis Bacon

Bacon's conceptualization of science as the search for resemblances and differ-
ences finds no more apt application than in the arena of managerial behavior. Ow-
ing largely to its complexity and its importance to organizational success, manage-
rial behavior has been the topic of repeated scientific investigation spanning more
than 80 years (Borman & Brush, 1993). A unifying aim of that research has been to
identify the general dimensions of managerial performance. Although contributing
to the study of management by summarizing a complex domain, the generalist ap-
proach suffers from certain key limitations. Perhaps its biggest shortcoming is its
encouragement of the assumption that specific exemplars within general categories
are equivalent with respect to function, causes, and measurement. Short-term and
strategic planning, for example, are often seen under the same heading (e.g.,
Borman & Brush, 1993; Yukl & Lepsinger, 1992), yet their correlates and value in
particular contexts can vary substantially: We should be cautious about generaliz-
ing performance in short-term planning to performance in strategic vision when
considering an individual for promotion from middle to upper management. Such
concerns call for carefully reasoned articulation of managerial behavior.

The need for greater construct specificity is prompted also by repeated prescrip-
tions for theory in understanding trait–performance linkages (Borman &
Motowidlo, 1997; Guion & Gottier, 1965; Tett, Jackson, & Rothstein, 1991; Tett,
Jackson, Rothstein, & Reddon, 1999). An important part of any programmatic effort
to advance theory guiding the prediction of job performance will be a careful de-
scription of content on both sides of the equation (Paunonen, Rothstein, & Jackson,
1997; Schneider, Hough, & Dunnette, 1996). Emphasis on specificity does not di-
minish the importance of general constructs, which provide convenient frameworks
for research. Rather, it invites the detail needed for informed use of those con-
structs regarding their interpretation and, accordingly, their contributions to predic-
tion. General (i.e., complex, multidimensional) measures can dilute predictive
variance in more important specific measures (Ashton, 1998; Ashton, Jackson,
Paunonen, Helmes, & Rothstein, 1995). Theory-driven approaches to understand-
ing the managerial domain are particularly demanding of specificity given the com-
plex, abstract nature of managerial behavior and the settings in which it is observed.

The aims of this article are to (a) summarize recent discussion of the band-
width–fidelity tradeoff as it pertains to the specificity–generality distinction in
matching people to jobs; (b) identify the advantages and challenges of construct

specificity, particularly in applications to the managerial domain; (c) describe development of a new and unique "hyperdimensional" taxonomy of managerial competence; (d) report results from three studies designed to evaluate and improve the taxonomy with respect to both content and level of specificity; and (e) show how the specificity of the proposed taxonomy can help integrate diverse managerial and leadership dimensions.

BANDWIDTH AND FIDELITY IN PERSONNEL ASSESSMENT

Psychological test developers face many challenges in creating reliable, valid, and usable measures (cf. Jackson, 1970, 1994). Two important concerns relating directly to the specificity–generality issue are fidelity and bandwidth (Cronbach & Gleser, 1965; Shannon & Weaver, 1949). Fidelity (low/high) denotes the precision with which a measure captures a particular construct, whereas bandwidth (narrow/broad) refers to the number of distinct constructs sampled by a given measure. The distinction is usually presented as a continuum whereby fidelity is purchased at the cost of bandwidth, and vice versa. In practical terms, test users are faced with the choice of measuring a few things well (i.e., high fidelity, high interpretability) or more things less well (broad bandwidth, more comprehensive coverage). The tradeoff is most apparent when one holds the measurement interval constant (e.g., 1 hr).

Ones and Viswesvaran (1996) discussed the fidelity–bandwidth "dilemma" in the context of personnel selection. Their main argument was that broad bandwidth criteria, such as the general measures often used in selection and validation efforts, require the use of similarly complex (i.e., multidimensional) predictors. On the basis of this argument, they hoped to justify use of general personality measures heterogeneous with respect to broad trait constructs (i.e., the Big Five) in promoting not only prediction but also theory regarding trait–performance relations. Their article drew immediate criticisms from four independent sets of researchers (Ashton, 1998; Hogan & Roberts, 1996; Paunonen et al., 1999; Schneider et al., 1996). Our goal here is not to summarize all the points raised concerning Ones and Viswesvaran's (1996) position, which are numerous and varied, but rather to target only the main issues regarding the use of specific versus general measures in the prediction of job performance.

First, the fact that job performance criteria are often complex does not imply that predictive accuracy would not be improved with the use of more specific measures (Ashton, 1998; Ashton, Jackson, Paunonen, Helmes, & Rothstein, 1995; Hogan & Roberts, 1996). Schneider et al. (1996) and Paunonen et al. (1999) argued that both prediction and understanding of job performance suffer by the failure to articulate performance and predictor constructs in more specific terms. Narrow trait scales, for example, can capture important criterion variance components that are obscured in general measures (Ashton, 1998). Campbell

(1990, 1994) and others (e.g., Borman & Motowidlo, 1993; Murphy, 1994; Murphy & Shiarella, 1997) have argued on similar grounds for greater specificity in performance criteria. Second, matching predictor and criterion measures in complexity alone is insufficient grounds for expecting better prediction. Beyond complexity, one must also match measures in terms of content (Ashton, 1998; Paunonen et al., 1999; Schneider et al., 1996). Thus, even when complex measures are preferred, it is imperative that the nature of that complexity with respect to content is matched between the predictor and criterion spaces. In an important sense, then, specificity precedes generality.

A third point to emerge from the discussions of the fidelity–bandwidth tradeoff derives from basic measurement principles. Ones and Viswesvaran (1996) argued that broad measures have an advantage over narrow measures by affording greater reliability (e.g., Cronbach's alpha) due to increased length. There is more to reliability than test length, however. It is also a function of how strongly the test items are intercorrelated, that is, the degree to which the items are internally consistent (Cortina, 1993). A complex test contains item subsets that are relatively independent of one another. The overall average inter-item correlation can be moderately high in such cases, but the subsets will average higher internal consistency within themselves (they are identified as such). Complex measures will be more reliable only when increased length compensates for diluted internal consistency. Short measures, in fact, can be quite reliable. Despite having only two or three items, turnover intention measures often have internal consistency reliabilities above .8 (there are few ways of asking how likely someone will quit; Tett & Meyer, 1993). In short, specific measures, even if they are substantially shorter than their broader counterparts, are not necessarily less reliable. Fears raised over the use of specific measures arising from supposed losses in reliability are, accordingly, largely unfounded.

A final point concerning Ones and Viswesvaran's perspective—one that has not been recognized in previous responses—is that the tradeoff between high-fidelity and broad-bandwidth measures with respect to time is not so obvious when one considers the benefits of confirmatory research. Conceptual and empirical analysis of a job can identify key personological variables related to performance (Raymark, Schmit & Guion, 1997; Tett et al., 1991; Tett et al., 1999). To the degree that such analyses separate wheat from chaff, distinct measures of specific relevant constructs will afford greater efficiency than that of broadbandwidth measures, which are more likely to include a combination of relevant and irrelevant content. By ignoring irrelevant content, test users have more time to measure relevant specific content. Specificity, moreover, is inherently suited to confirmatory strategies because of its explicit attention to content. Thus, specificity not only allows better use of testing time, it promotes it when guided by systematic job description.

In sum, reasoned discussion surrounding the fidelity–bandwidth distinction leads in the direction exactly opposite that of Ones and Viswesvaran (1996) with regard to the use of specific versus general measures. In particular, greater specificity

is beneficial by (a) encouraging more detailed analysis of the nature and bases of job performance, (b) providing a basis for interpreting scores on general (i.e., multidimensional) measures (i.e., in using a general measure, it is critical to know what dimensions it assesses and in what proportions), and (c) allowing more (not less) efficient use of test time by promoting identification of explicitly job-relevant constructs. Other advantages of specificity in research and practice are outlined next.

SPECIFICITY AND GENERALITY: CONTRIBUTIONS TO SCIENCE AND PRACTICE

The preceding discussion raises interesting issues regarding the role of specificity in describing, using, and understanding the managerial performance domain. Five critical differences between specifist and generalist approaches are summarized in Table 1 and discussed with respect to personnel selection. Extended discussion in the context of managerial performance provides the critical foundation for the current model development efforts.

The first two comparisons in Table 1 favor the use of general constructs. In Point 1, general dimensions serve a valuable role in organizing disparate constructs. The Big Five personality taxonomy, for example, has provided researchers with a parsimonious framework within which to pursue study of individual differences (e.g., Raymark et al., 1997). The same is true of general taxonomies of job performance (e.g., Campbell, McCloy, Oppler, & Sager., 1993). In Point 2, because general constructs are fewer in number, they tend to be easier to manage. This is important in personnel selection where it is most convenient to rank job candidates and validate predictor measures with respect to a single, general performance criterion. Points 1 and 2 are very different from those offered by Ones and Viswesvaran (1996) favoring use of general measures. In particular, they are practical, not theoretical, in nature. Practical concerns are rarely trivial, and in this case they go a long way toward explaining the dominance of generalist perspectives in

TABLE 1
Comparisons Between Generality and Specificity As Measurement Strategies

Generality	Specificity
1. Organizes diverse constructs; provides convenient frames of reference	Promotes complexity; inhibits identification of simple frameworks
2. Makes the study of behavior seem easy	Makes behavioral study seem difficult
3. Impedes efforts to study and improve the fit between individual and situation (e.g., job)	Allows more refined person–situation fit
4. Limits understanding of causes, effects, and measurement	Is required for complete understanding of causes, effects, and measurement
5. Contributes to validation by emphasizing its structural aspect	Contributes to validation by emphasizing construct content

the study of person–job linkages. Despite the attraction of general dimensions, however, it is reasonable also to consider their liabilities.

The next two points in Table 1 favor specificity. In Point 3, use of complex constructs can interfere with attempts to match people to jobs by obscuring potentially important differences among facets. For example, a job might require someone high in dependability yet be neutral with regard to achievement (these two facets of Conscientiousness correlate only moderately positively and are not interchangeable; Hough, 1992). At a general level, each of two candidates (for the given job) might score highly on Conscientiousness but for different reasons, one high on dependability and average on achievement, the other with the reverse pattern. A generalist approach in this case would yield a good fit with an expected probability of .5. A suitably specified approach (i.e., bidimensional in this case) would allow person–job matching with better chances of success. In Point 4, beyond prediction of fit, generality restricts understanding of the bases for relations involving a given measure. With components left unarticulated, reasons for differences in scores on general measures are ambiguous. For example, general performance might increase due to improvements in any of a variety of more specific areas. Failure to identify those areas will weaken control and understanding of performance increases and ultimately undermine organizational interventions.

Point 5, the last in Table 1, suggests that both generalist and specifist approaches are important in construct validation efforts. A generalist orientation can lead to identification of clusters of interrelated components in the evaluation of structural validity (Jackson, 1970; Loevinger, 1957; e.g., using factor analysis). A specifist orientation, on the other hand, promotes analysis of content and provides a basis for testing convergent and discriminant validity. Expectations of the direction and strength of a relation, which lie at the heart of construct validation, are possible only in light of a specified nomological net (Cronbach & Meehl, 1955); the more clearly the net is articulated, the more powerful the validation. In sum, both specificity and generality are important in a complete science of behavior. Our goal is not to discredit the role of generality in understanding the nature and causes of behavior but rather to enhance appreciation for the role of specificity in measurement, especially in the study of managerial behavior.

THE NEED FOR A DETAILED TAXONOMY OF MANAGERIAL COMPETENCE

One of the biggest reasons for the broad and continuing interest in managerial behavior as a research topic—beyond the obvious point that it is an important contributor to organizational success—is that its complexity poses diverse challenges to those who seek to predict, regulate, and understand it. Among those challenges are (a) explication of the roles and functions served by management within local and broader organizational contexts; (b) identification of meaningful classes of behavior (within

and across more general roles) with which individual managers can be compared for decisions relating to development, selection, and promotion; (c) organization of behavior classes into convenient taxonomies; (d) study of the sources of managerial behavior, including diverse personological and situational factors and the processes by which they interact; and (e) evaluation of managerial behavior in light of complex work demands and the frailties of human judgment. These research areas are interrelated. Performance evaluation, for example, is predicated on the identification of behavior classes and facilitated further by their organization. We suggest, in light of the previous sections, that the study of managerial behavior is likely to be advanced on each front by emphasizing less the broad similarities in behaviors, as occurs with general taxonomies, than their unique features. This, again, is not intended to discredit broad taxonomies. Rather, it stresses the need for co-consideration of specificity and generality in dealing more fully with the complexity of managerial behavior.

Among the most important roles of specificity in studies of managerial performance is that it provides a basis for detailed comparisons among managerial jobs and the people in them. We may wish to know, for example, not merely the degree to which middle and senior management jobs differ in the importance of "Planning and Organizing" but how they vary in short-term versus strategic planning; not just how two managers differ in their reliance on participative decision making, but their respective use of seeking advice versus decision delegation. Such qualitative distinctions require suitably specified constructs. A related application of specificity is in providing a framework for mapping alternative classes of managerial behavior developed in unique settings or research traditions. At the end of this article, we show how the proposed taxonomy can help integrate prominent dimensions of management and leadership.

In addition to helping meet key research challenges, greater specificity can contribute to the study of managerial behavior in several applied respects. In particular, careful articulation of the managerial performance domain can (a) give direction to the development of performance measures (i.e., we need to know what we are going to assess before we can decide how to assess it), (b) keep better track of areas where behavior is consistent across situations (e.g., among assessment center exercises; from one job setting to another), (c) facilitate identification of predictor constructs that will help explain the bases of managerial performance, (d) serve as a foundation for job analysis to allow job profiling and improved person–job fit, and (e) allow detailed diagnostic feedback in employee development (Thornton, 1992). Thus, a well-specified taxonomy can be expected to further selection, training, and associated measurement objectives.

Another important application of specificity in considering managerial performance stems from research in the personality–job performance literature showing that a given trait may be related positively to performance in some jobs and negatively in others (Hough, 1992; Tett et al., 1991; Tett, Jackson, Rothstein, & Reddon, 1994; Tett et al., 1999). The conceptual leap from differences in

directionality between jobs to within jobs is relatively short. A growing body of research supports the view that bidirectionality in trait–performance linkages may be domain-specific (Bunce & West, 1995; Driskell, J. Hogan, Salas, & Hoskin, 1994; Hogan, Hogan, & Murtha, 1992). Use of general performance measures can obscure potentially important distinctions in how selected traits are related to work behavior. This may be especially likely to occur in managerial settings, where trait-relevant task, group, and organizational demands are diverse and complicated. For example, creativity might predict strategic vision positively but short-term planning negatively. To the degree that the targeted job requires both types of planning, combining them in measurement under the more general heading of "Planning and Organizing" will obscure understanding of how and to what degree creativity contributes to managerial success. Along those lines, Robertson, Gibbons, Baron, MacIver, and Nyfield (1999) found that Conscientiousness predicts distinct managerial competencies in opposite directions. Similar results obtained for Extraversion. They conclude that "there is a clear case for examining managerial success at the level of specific competencies" (p. 11).

The aforementioned arguments favoring specificity are elucidated by consideration of three important ways in which managerial behaviors—even those sharing the same general heading—can differ. First, despite being generally similar, two behaviors can be unique in *function.* Short-term and strategic planning, for example, serve very different purposes and accordingly are uniquely valued: The former guides routine, day-to-day operations whereas the latter contributes to long-term organizational survival. Second, conceptually related behaviors can have different *causes*. Traits and skills underlying effective short-term planning (e.g., attention to detail) are likely to be distinct from those contributing to longterm vision (e.g., creativity). Finally, related behaviors can require unique methods of *measurement.* In-basket memos, for example, routinely provide opportunities for short-term planning. Opportunities for strategic vision require more careful consideration of memo design. There are many other cases where clear distinctions can be drawn between two or more managerial behaviors that might otherwise be considered pragmatically under a broader heading. We offer the following few examples.

Problem Awareness and Decision Making

Making good decisions is a key part of managerial success. Decision quality will depend on how well the manager understands the problem being addressed, but the dependency is far from complete. Decision research has shown that situation perception and general reasoning are distinct aspects of the decision-making process (Chi, Glaser, & Farr, 1988; Klein, 1989). Managers can make bad decisions even when problems are well defined. To the degree that decision quality is affected by factors other than clarity in problem perception, it is helpful to distinguish between them in furthering understanding of managerial performance.

Routine and Developmental Goal Setting

Goals can be set for different reasons and the nature of those goals can vary accordingly. When goals are specified, it is usually toward accomplishing tasks directly related to organizational success. Developmental objectives are unique because they pertain directly to individuals and only indirectly to organizational effectiveness. Task-related goals are set on a day-to-day basis, whereas developmental goals are set in the context of performance appraisal and feedback. A manager might often set task-related goals but require special orientations to subordinates to set goals for the purpose of employee development.

Coordinating and Team Building

Managers are responsible on a daily basis for varied resources, including human and monetary capital, as well as time, space, and equipment. Pragmatically, subordinates' skills are commodities to be coordinated with other resources toward maximizing unit productivity. Getting subordinates to work effectively as a team, however, is a specially important activity that goes beyond mere coordination. Team building must take human nature into account, in particular the motivational bases for effective collaboration among unique individuals with intersecting roles. Coordinating resources and building teams, although related, are unique managerial functions with unique sources.

Many other examples could be offered in showing the need to distinguish among broadly similar managerial behaviors (e.g., cooperation vs. compassion, urgency vs. timeliness, orderliness vs. rule orientation, adaptability vs. tolerance, oral communication vs. oral presentation, monitoring vs. individual performance assessment). In each case, paired dimensions may be moderately or even substantially related. It is equally relevant, however, to consider that they are not identical.

In sum, challenges stemming from the complexity of the managerial role call for greater attention to the details involved in its conceptualization. Broad behavioral dimensions that dominate the study of managers provide a convenient framework for investigation, but greater specificity allows a more fine-grained analysis of managerial behavior, its effects, causes, and measurement necessary in any complete analysis of that domain.

A SYNOPSIS OF PREVIOUS MANAGERIAL
PERFORMANCE TAXONOMIES

Several managerial performance taxonomies have been reported over the years, each with the express goal of identifying a relatively few general dimensions in an effort to be comprehensive and parsimonious. Twelve models were identified in the literature to be of particular importance in the current undertaking (Borman &

Brush, 1993; Campbell et al., 1993; two in Flanagan, 1951; Hemphill, 1959; Katzell, Barrett, Vann, & Hogan, 1968; Luthans & Lockwood, 1984; Morse & Wagner, 1978; Prien, 1963; Tornow & Pinto, 1976; Wofford, 1970; Yukl & Lepsinger, 1992).[1] We used these taxonomies as a starting point in developing the proposed model. Given their availability, one might reasonably ask: Why do we need a new model? We had two reasons.

First, in reviewing the previous taxonomies, we noted considerable variability in content, complexity, and comprehensiveness. Such differences could be traced to uniquenesses in method, population, and purpose. No one model was clearly superior to another in all respects. Although a relatively common core of behaviors was shared across models (e.g., Decision Making, Planning & Organizing), each was unique in its coverage of certain dimensions that could not easily be dismissed, for example, through combination with another category. Another example is the omission, especially in earlier models (e.g., Hemphill, 1959), of more contemporary concerns like employee development. Second, and most importantly in light of current objectives, all the previous efforts focused on identifying general dimensions of performance. Most of the prior taxonomies were derived using factor analysis with the explicit goal of data reduction. To meet the challenges of complexity noted earlier, we felt it necessary to dissect some of the broader dimensions (e.g., "Supervision/leadership" from Campbell et al., 1993) into smaller parts.

Our primary aim was to begin development and validation of a "hyperdimensional" taxonomy of managerial competence. We offer the term "hyperdimensional" to emphasize our search for dimensions more specific than those promoted in previous efforts. In keeping with earlier discussion, we sought to identify managerial performance dimensions at a level of specificity guided more by expectations of differences (in function, causes, and measurement) than by redundancy. An overview of our model building process is provided next. It is presented here, rather than in the Method section, to highlight its connection to conceptual aims regarding specificity and content coverage. We begin by offering an understanding of managerial competency as an appropriate unit of analysis.

A CONCEPTUALIZATION OF
MANAGERIAL COMPETENCY

Research on job performance as a criterion measure and as a theory-worthy construct (Borman & Motowidlo, 1993; Campbell et al., 1993; Murphy & Shiarella,

---

[1]Due to a literature search oversight, we missed a relevant article by Schippman, Prien, and Hughes (1991) reporting results of qualitative analyses of managerial tasks and skills, that parallels current efforts in certain respects. Readers are urged to consult that work for comparable but unique coverage of related issues, goals, and findings.

1997) has yielded a variety of conceptualizations of job performance, including behaviors, outcomes, retention, and promotion. Choice of concept depends on purpose (Murphy, 1994). Goals favoring use of behavioral indicators include performance evaluation, job description, and research on cross-situational consistency, each of which are furthered by targeting direct indicators of underlying KSAO's. Use of behaviorally oriented variables promotes reliability and validity and lends credibility to assessment. In addition, more than other approaches, a behavioral orientation directs attention to performance that is attributable to the individual. (This is not exclusively true; behavioral performance can be affected by situational factors directly and in interaction with personological sources.) In an effort to create a model diverse in research application and amenable to accepted measurement methods, a behavioral definition of performance was adopted here.

In addition to focusing on behavior, we sought a conceptualization of managerial performance that emphasizes its evaluative nature. Obviously, job performance is of interest because it affects an organization's success. Value, however, depends on context: A work behavior that is desirable in one setting may be undesirable in another. For example, strategic planning in senior management may be highly rewarded, but in first-line supervision it may be a wasteful distraction. Opportunities for such bipolarity are not rare (Tett, 1998; Tett et al., 1991, 1994, 1999). We desired a conceptualization of job performance that was sensitive to the potential bipolar desirability of managerial behaviors as a function of situational demands.

Finally, we wanted to capture the future-oriented nature of prediction and change. The model is intended to serve as a foundation for selection, development, and related efforts that are invariably targeted to future sitautions. All things considered, we identified the concept of competency as a suitable unit of analysis. Competencies and competency modeling are receiving increasing attention in industrial/organizational (I/O) psychology and human resource management (Harris, 1998). With the understanding that the concept of competency is by no means firmly established, we offer the following working definition:

> A competency is an identifiable aspect of prospective work behavior attributable to the individual that is expected to contribute positively and/or negatively to organizational effectiveness.

In short, a competency is future-evaluated work behavior. Our definition lacks precision in some ways (e.g., regarding when and how competencies might be expressed). Nonetheless, it reflects the main assumptions in our understanding of managerial performance, as discussed earlier, and guided model development efforts accordingly.

A RATIONAL PROCESS FOR DEVELOPING A
MANAGERIAL COMPETENCY MODEL

We sought a comprehensive list of managerial competencies that, collectively, would allow meaningful and relatively precise distinctions among diverse jobs representing all managerial functions (e.g., manufacturing, personnel, general), industries (e.g., telecommunications, automotive, financial), sectors (e.g., private, public, entrepreneurial, nonprofit), and levels (first-line to CEO). Individually, a given competency was expected to be at least moderately relevant in describing at least some managerial jobs. Few competencies (e.g., Decision Making) were expected to be relevant in all managerial jobs. Differences between jobs (levels, functions, industries, etc.) in competency importance and expression was considered a matter for future research. Although a relatively high level of specificity was desired, high specificity entails a large number of variables, which can be unwieldy. Practical concerns were heightened by the desire to identify multiple descriptors per competency, so as to allow greater reliability and content coverage through aggregation. Our goal of specificity was tempered accordingly. It would be convenient if we could specify beforehand just how many competencies (and exemplars) are needed for a comprehensive but useable taxonomy. Unfortunately, no guidelines exist for such a determination. Our expectations were guided, however, by the observation that Borman and Brush's (1993) model, among the most detailed reported to date, contains 18 dimensions that are broader than we believe is desirable and, moreover, is based on a sample only partly representative of our targeted (i.e., most general) managerial population. In the current effort, therefore, we expected to articulate somewhat more than 18 dimensions, perhaps as many as 50. Also, although we envisioned a hierarchical arrangement of specific competencies, structure was deemed secondary in importance to content. The uniqueness of our objectives called for a suitably unique model development strategy.

We began by assembling a master list of observable dimensions from the 12 previously published performance taxonomies noted earlier. Each of the 109 dimensions was dissected into more specific parts and redundancies in the parts were collapsed. The process of identifying specific competencies was guided by three rules of thumb, each considered a necessary condition for competency status, and only collectively as sufficient. First, the *10% rule* states that a performance dimension can be a distinct competency only if that dimension is expected to be at least moderately important in at least 10% of all managerial jobs. This general guideline reflects the desire to make the model applicable to a wide range of managerial levels and functions, ignoring only the most obscure dimensions and jobs. It is a fairly liberal criterion in that we felt it appropriate to be over- rather than under-inclusive in an effort to be comprehensive.

The remaining two rules of thumb were applied in opposition to one another. The *splitting rule* states that two facets of a given performance dimension warrant separation to the degree that they are less than perfectly related. This is akin to guidelines used in traditional data reduction efforts, but it is opposite in orientation. Consider, for example, that the true correlation between two behaviors is .60. In a general taxonomy, these two behaviors would almost certainly load the same factor. That the proportion of shared variance is 36%, however, leaves ample room for each behavior to have unique correlates (e.g., up to .80 for one behavior vs. 0 for the other). This rule reflects the intended use of the model for prediction of specific aspects of managerial performance (e.g., short-term vs. strategic planning) and provision of diagnostic feedback on training needs (Thornton, 1992). The *combination rule* states that any competency must be describable in terms of a specific label, a clearly worded definition, and at least three unique and more specific "behavioral elements." If we could not come up with three different ways of describing a proposed competency uniquely (i.e., such that a given behavioral element was not also potentially descriptive of any other competency), then that dimension was combined with the most suitable existing competency. This rule set the limits of specificity in this study.

The rules were applied by four independent-minded researchers with varying backgrounds in I/O psychology. They worked separately, in pairs, and as a group. All decisions were made in a spirit of consensus in light of developmental goals. Disagreements were settled primarily by rational argument with reference to plausible examples and, if that failed (which happened rarely), by the judgment of the senior author, always with rational justification. The model was developed in this way over numerous, lengthy discussions. Sets of competencies, definitions, and behavioral elements were reviewed repeatedly and in detail to identify and repair ambiguous or otherwise misspecified terms. Preliminary drafts of the model were presented to 12 local human resources managers individually in promoting assessment services based on the model. Input was sought especially regarding missing competencies. Several suggestions resulted in model refinements.

We believe our procedure has merit but we acknowledge grounds for criticism in three respects. First, our rules of thumb are naturally subjective. Rather than attempt to defend them on first principles, we offer the empirical findings reported in later sections as a more suitable basis for judgment. Second, outside expert input was not sought until a relatively late stage. In partial defense, we note that our work was founded on a variety of comprehensive, peer-reviewed taxonomies of managerial behavior. Thus, expert input spanning many years, populations, and research methods was built into the process from the outset. Third, in restricting our focus to peer-reviewed studies, we ignored a growing number of managerial competency models from the consulting sector. Accordingly, competencies identified as important by practitioners may have been overlooked. We address this issue directly toward the end of the article by comparing our model with those provided by

several successful I/O consulting firms. Gaps in coverage would offer direction in further development efforts.

A FIRST DRAFT OF A HYPERDIMENSIONAL
TAXONOMY OF MANAGERIAL COMPETENCE

Our preliminary efforts yielded 47 distinct managerial competencies. Several features of the initial model warrant brief review. First, each competency was described using a specific label, definition, and three more specific and, we hoped, uniquely targeted behavioral elements. For illustration, the contents of the first two competencies are provided here.

Problem Awareness: Perceives situations that may require action to promote organizational success.

- Anticipates problems before they arise.
- Understands the potential impact of problems on the organization.
- Seeks to clarify the nature of problems when they are unclear.

Decision Making: Uses good judgment in resolving problems.

- Identifies appropriate action in effectively resolving problems.
- Weighs alternative courses of action and their potential implications in making decisions.
- Chooses the best course of action from available alternatives.

Although designed to be specific with respect to content, the competencies are general in application to particular situations (e.g., management levels and functions). This reflects the intended applicability of the model to a wide range of managerial contexts.

Second, we organized the 47 competencies into nine general categories: *Traditional Functions* (e.g., Decision Making, Directing), *Task Orientation* (e.g., Initiative, Urgency), *Person Orientation* (e.g., Worker Concern, Sociability), *Open Mindedness* (e.g., Tolerance, Creative Thinking), *Emotional Control* (e.g., Resilience), *Communication* (e.g., Listening Skills, Oral Communication), *Developing Self and Others* (e.g., Developmental Goal Setting, Self- Development), *Occupational Acumen and Expertise* (e.g., Job Knowledge, Quality Concern), and *Person–Organization Fit* (e.g., Organizational Awareness, Loyalty). Unlike general dimensions derived in earlier models, the proposed categories were not intended to represent structural hypotheses based on expected correlations among competencies. For example, placing Decision Making and Directing in the Traditional Functions category implies no particular correlation between

them. Rather, the first category represents what we perceived to be the most commonly cited dimensions. Competency organization is of secondary importance in this undertaking and may, in fact, vary across settings and populations. This is an important issue for future research.

Third, many of the competencies bear trait-like labels (e.g., Initiative, Urgency). All the competencies are intended to denote work behaviors attributable to the individual. Behavior is often described using trait concepts. Competencies, more than general traits, might be expected to be amenable to change, for example, through training, but this distinction seems a little arbitrary. We suggest that the use of trait terms in the present context follows naturally from an understanding of work behaviors as particular cases of trait expression. Use of trait terms here is consistent with the proposed competency definition as well as intended applications of the model. The key is to consider the trait-like labels as signifying only managerial behavior, which may or may not be related empirically to trait expressions in other settings.

A fourth point is that certain key themes in managerial performance appear to be omitted. For example, there are no competencies or headings for Leadership, Time Management, Conflict Management, and so forth. The reason is that we see these dimensions as (a) broad combinations of competencies that are (b) specific to a given job and/or company. Leadership in Company A, for instance, might include Motivating Others, Team Building, and Worker Concern, whereas in Company B it might contain Motivating Others, Directing, and Strategic Planning. This perspective (a) recognizes that dimensions like leadership mean different things to different people and organizations, (b) accounts for the possibility that a given competency may be involved in multiple general performance categories (e.g., Tolerance might be part of both Conflict Management and Customer Service Orientation), and (c) emphasizes that the organization of managerial behaviors is not fixed. We suggest that particular combinations of competencies be denoted as "modular clusters" in recognition of their potential uniqueness. Examples of how the model's specificity can help integrate diverse dimensions are provided at the end of the article in light of our results.

OVERVIEW OF TAXONOMY VALIDATION

Three mailout studies distinct in design were undertaken to evaluate and improve the proposed taxonomy. The main questions we asked were (a) how well do the behavioral elements uniquely represent their targeted competencies?; (b) how acceptable are the competency labels and definitions to the sorts of people likely to use the model?; and (c) what dimensions are we missing? Studies 1 and 2 assessed in separate mailouts the viability of the 47 specific competencies derived from the literature review. Results from both efforts directed refinement of the taxonomy with respect to each competency's uniqueness and the model's comprehensiveness. The most

notable modification was the breaking out of six new competencies. Study 3 allowed an independent and rigorous evaluation of the resulting 53-competency framework. The first two studies are described in tandem in light of their addressing the same set of competencies and behavioral elements. Study 3 warrants separate consideration.

STUDIES 1 AND 2

Method

Participants

Materials were mailed to 660 randomly selected Academy of Management members ($N = 300$ in Mailout 1, $N = 360$ in Mailout 2). Response rates were approximately 10% ($N = 31$) and 20% ($N = 79$), respectively. Collapsing across studies (for sample description purposes only), respondents included 75 men (68.2%) and 35 women (31.8%), 97 Whites (88.2%), 4 African Americans (3.6%), 1 Asian/Pacific Islander, 1 Hispanic, and 7 in other categories. Mean age was 42.7 years ($SD = 11.6$) and professional experience averaged 15.7 years ($SD = 11.6$). Primary work settings included academia ($N = 78$; 70.9%), business (20; 18.2%), government (6; 5.5%), and other (3; 2.7%). The group included 76 (69.1%) with a doctorate degree, 28 (25.5%) with a Master's degree, and 3 (2.7%) with a Bachelor's degree. Fifty-four (49.1%) specialized in human resources management, 16 (14.5%) in I/O psychology, 9 (8.2%) in organizational behavior (OB), 4 (3.6%) in management, 3 (2.7%) in strategic management, and the remainder in miscellaneous and/or combined areas. The data reveal a good deal of variability in biographics and professional backgrounds, albeit with greater representation of Whites, men, academics, PhDs, and human resources specialists. Most importantly, they suggest adequate expertise on the part of the subject matter experts (SMEs) who evaluated the model.

Measures and Procedure

All respondents completed materials described as a content validation of a model of managerial performance. The main task was to sort randomly ordered elements into their targeted competency labels and definitions. The total number of behavioral elements was 141 (3 per competency). This number was deemed too large to assign to any one person for sorting. Accordingly, the task was partitioned in each of the two mailouts, as follows.

Mailout 1.   Three groups of 100 participants were mailed a complete list of the 47 competency labels and their definitions as well as one of three lists of 47 behavioral elements, each list containing one element from each competency. Partici-

pants were asked to match each of the behavioral elements with the appropriate competency label (i.e., sort 47 elements into 47 categories). The low response rate in Mailout 1 (i.e., 10%) was attributed to the task being too demanding. We changed the task in Mailout 2 in an effort to improve response rates.

Mailout 2.   Five groups of 60 participants were mailed one of five randomly compiled sets of either 9 or 10 competency labels and their definitions along with a list containing in random order all three behavioral elements from each competency in the given set. As in the first mailout, participants were asked to match each of the behavioral elements with the appropriate competency label in their set, except in this case 27 elements were sorted into 9 categories or 30 into 10. A follow-up mailout to 60 additional, randomly selected Academy members was undertaken, in proportion to differences in response rates between competency sets (i.e., in an effort to balance the numbers of respondents per set). We attribute the increased response rate (i.e., 20%) to reduction in the burden of the task.

In addition to sorting elements into competencies, participants were asked to offer suggestions as to how the competency labels and definitions might be improved (e.g., regarding clarity and specificity). Mailout 1 participants were also asked to suggest areas of managerial performance not represented in the set (this was not relevant in Mailout 2, given that each participant received only about one fifth of the 47 competencies). As a modest incentive, we offered to send a copy of a research report summarizing the main findings.

Statistical Analysis

The main empirical question here is the degree to which each proposed behavioral element is uniquely classifiable into its targeted competency. Each element was assessed in terms of two criteria. First, the classification of a given element into its intended competency had to be the modal response; that is, more people had to place it where it was designed to go than anywhere else. Second, the number of people correctly classifying the element had to reach statistical significance according to a modification of the binomial test, described here. The binomial test compares observed frequencies with those expected due to chance. Critical values, expressed as *N,* go up (for any given number of respondents) as the number of choices gets smaller. Our task was one of increasing chance probabilities of success owing to choices becoming increasingly restricted as sorting proceeds. That is, under random sorting, each person (in Mailout 1) would have a 1-in-47 chance of being correct at the beginning of the task. The second choice could be similarly characterized as a 1-in-46 chance, the third as 1-in-45, and so on. Thus, the critical *N* would increase from start to finish (i.e., a 1-in-2 chance toward the end of the sorting task would require more than half the sorters to be right for significance to be achieved). In taking this gradient into account, we determined the critical *N* for each successive sort

(e.g., 1-in-47, 1-in-46, etc. in Mailout 1) and used the average as our critical *N* for each element.

Results

Table 2 contains key findings from the sorting task in Mailouts 1 and 2. Values on the left are percentages of respondents classifying each element into its targeted competency (i.e., hit rates). Average hit rates for each mailout are acceptable overall (range = .58 to .81 for Mailout 1 and .80 to .88 for Mailout 2). The higher rate in Mailout 2 is attributable to inclusion of fewer categories (i.e., 9 or 10 vs. all 47) in the sorting task. Hit rates varied considerably across competencies (e.g., .00 to 1.00 for Element 2 in Mailout 1). Ignoring mean differences, hit rates in the two studies were moderately consistent: The correlations in hit rates between mailouts were .52, .37, and .55 for elements 1, 2, and 3, respectively.

The right side of Table 2 shows statistically significant percentages of classifications into nontargeted competencies and the location of those sortings (numbered competencies in parentheses). The significant misses tend to be lower than their corresponding hits. Misclassifications in most cases make sense in light of conceptual overlap between the targeted and mistargeted competencies. For example, elements from competencies in the Developing Self and Others cluster are involved in several cross-classifications within that cluster. Of the 141 elements subjected to analysis, 126 in Mailout 1 and 137 in Mailout 2 meet both criteria for acceptance (i.e., modal frequency and binomial significance); 125 elements are acceptable in both studies. All three elements per competency meet the criteria in both studies in 33 of the 47 cases, two elements are acceptable in 12 cases, and one element is acceptable in the two remaining cases.

Discussion

Studies 1 and 2 were undertaken to evaluate the hyperdimensional taxonomy of managerial competencies that emerged from the literature review. Of particular interest was the success with which the specific behavioral elements could be sorted into their targeted competencies. Our efforts were supported in that the large majority of elements were classified reliably into their preassigned competencies by subject matter experts. The SMEs suggested no dimensions other than variations on existing competencies or those judged to be a more general (i.e., "modular") cluster. This suggests adequate comprehensiveness of the model in representing the managerial performance domain. The findings support the possibility that managerial competencies bear considerably greater specification than that captured by previously reported taxonomies. Results, however, suggest grounds for two kinds of improvement. First, elements with poor hit rates call for clarification or replacement. Second, competencies attracting nontargeted elements call for clarification of the

TABLE 2
Proportions of Respondents Assigning Behavioral Elements to
Targeted and Nontargeted Competencies in Studies 1 and 2

| | Proportions for Targeted Competencies[a] | | | | | | Proportions for Nontargeted Competencies[b] | | | | | |
| | Element 1 | | Element 2 | | Element 3 | | Element 1 | | Element 2 | | Element 3 | |
Competency	S1[c]	S2[d]	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
Traditional Functions												
1. Problem Awareness	.82	1.00	.56	.94	.45	.80			.22(15)			
2. Decision Making	1.00	.87	.67	.93	.73	.87					.18(16)	
3. Directing	.36	.89	.44	.72	.82	.75	.36(7)					
4. Decision Delegation	1.00	1.00	.78	.94	.73	.94					.27(24)	
5. Short-Term Planning	.73	.94	.44	1.00	.73	.86	.18(7)		.22(3)/.22(16)		.27(1)	
6. Strategic Planning	1.00	.84	.89	.84	.91	.85						
7. Coordinating	.45	.87	.22	.92	.36	.71	.27(3)		.33(14)		.18(10)	
8. Goal Setting	.73	.81	.89	.85	.36	.22	.55(10)				.18(36)	.61(3)
9. Monitoring	.45	.35	.44	.83	.55	.81	.55(11)		.22(42)		.27(7)	
10. Controlling	.18	.33	.44	.94	.45	.69	.18(10)	.65(10)	.22(42)		.18(1)/.18(38)	
11. Motivating Others	.45	.71	.56	.88	.45	.77		.67(11)	.22(24)		.18(22)	
12. Team Building	.82	.88	.67	.86	.82	1.00			.33(7)			
Task Orientation												
13. Initiative	.64	.80	.89	.87	.55	.80	.36(15)				.18(11)	
14. Task Focus	.82	.92	.00	.73	.45	.56			.44(43)		.36(8)	
15. Urgency	.64	.94	.56	.95	.82	1.00	.27(13)					
16. Decisiveness	1.00	.92	.56	.92	.73	.77						
17. Assertiveness	1.00	.93	.44	.80	1.00	.87			.22(10)		.18(24)	
18. Orderliness	.91	.91	.67	.85	.27	.85			.22(21)			
19. Rule Orientation	1.00	.95	.67	.89	1.00	1.00						
20. Personal Responsibility	.91	1.00	1.00	1.00	.45	1.00					.27(40)	
21. Dependability	.91	1.00	.22	1.00	.45	.81			.22(25)		.55(18)	
22. Professionalism	.73	1.00	.56	.92	.45	.62					.18(31)	

(Continued)

TABLE 2
(Continued)

Competency	Proportions for Targeted Competencies[a]						Proportions for Nontargeted Competencies[b]					
	Element 1		Element 2		Element 3		Element 1		Element 2		Element 3	
	S1[c]	S2[d]	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
Person Orientation												
23. Worker Concern	.73	.89	.78	.76	.27	.74					.18(24)/.27(25)	
24. Participative Management	.91	.80	.67	.88	.27	.50					.36(27)	
25. Interpersonal Effectiveness	.91	.84	.22	.89	.36	.40			.33(26)		.27(32)/.27(33)	
26. Sociability	.91	1.00	.22	.83	1.00	1.00			.22(25)/.44(33)			
Open Mindedness												
27. Tolerance	1.00	1.00	.78	.95	.55	.95					.18(23)	
28. Flexibility	.91	.89	.33	.29	.82	.70			.44(40)	.57(40)		
29. Creative Thinking	1.00	1.00	.89	1.00	1.00	1.00						
Emotional Control												
30. Resilience	.82	.88	.78	.89	.73	.89					.18(14)	
31. Stress Management	1.00	.93	.89	.87	.82	.87						
Communication												
32. Listening Skills	1.00	1.00	.56	1.00	.64	.82			.22(14)		.36(33)	
33. Oral Communication	1.00	1.00	.44	1.00	.36	.83			.33(34)		.18(14)	
34. Oral Presentation	1.00	.93	.67	.93	1.00	.87						
35. Written Communication	.91	1.00	1.00	1.00	.82	1.00						

(Continued)

TABLE 2
(Continued)

	Proportions for Targeted Competencies[a]						Proportions for Nontargeted Competencies[b]					
	Element 1		Element 2		Element 3		Element 1		Element 2		Element 3	
	S1[c]	S2[d]	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
Developing Self and Others												
36. Developmental Goal Setting	.45	1.00	.89	.89	.64	1.00	.18(37)/.27(39)		.22(11)		.27(37)	
37. Developmental Performance Evaluation	.45	.93	.33	.87	.55	.81	.18(9)/.18(38)		.22(38)		.18(9)/.27(23)	
38. Developmental Feedback	.55	.86	.56	.93	.64	.87	.27(37)		.33(37)			
39. Job Enrichment	.64	.92	.89	1.00	.91	.86	.27(36)					
40. Self Development	.82	.71	.56	.83	.64	.57			.22(22)			
Occupational Acumen and Expertise												
41. Job Knowledge	.73	.53	.67	.68	1.00	.63			.22(9)			
42. Quality Concern	1.00	.95	.44	1.00	.91	1.00			.22(37)			
43. Financial Concern	1.00	.89	.56	.89	.91	.84			.22(10)			
44. Safety Concern	1.00	1.00	1.00	1.00	1.00	1.00						
Person–Organization Fit												
45. Organizational Awareness	1.00	.65	.11	.58	.73	.79			.22(47)			
46. Loyalty	1.00	1.00	.44	.50	.36	.47			.44(45)		.36(13)	
47. Team Player	.64	.73	.22	.77	.73	.81					.18(20)/.18(46)	
Average	.81	.88	.58	.87	.66	.80						
Min	.18	.33	.00	.29	.27	.22						
Max	1.00	1.00	1.00	1.00	1.00	1.00						

[a]Tabled numbers refer to proportion of participants classifying element into targeted competency. [b]Tabled numbers refer to the significant proportion of participants classifying element into one or more nontargeted competencies; numbers in parentheses refer to competencies numbered at left. [c]S1 = Study 1, Ns = 11, 9, 11; critical values = .18, .22, .18, for elements 1, 2, and 3, respectively. [d]S2 = Study 2, Ns = 14 to 19; critical values = .43 to .37, respectively.

competency labels and/or definitions. Both types of information can be considered in judging where best to direct change efforts. Refinements based on these considerations in light of the three rules of thumb described earlier yielded a modified set of 53 competencies. The general heuristic categories were modified slightly as well. Study 3 allowed validation of the revised model along the same lines as described in Study 2. Details of the revised model are discussed in light of corresponding results.

STUDY 3

Method

Participants

Materials were mailed to 490 randomly selected members of the Academy of Management who had not participated in the earlier studies. Of the 118 participants (response rate = 24.0%), 68 were men (57.6%). Ethnicity was as follows: 107 Whites (90.7%), 3 African Americans (2.5%), 3 Asian/Pacific Islanders (2.5%), 1 Hispanic, and 2 of other origins. Mean age was 41.9 years ($SD = 10.6$) and professional experience averaged 15.1 years ($SD = 9.8$). Primary work settings included academia ($N = 88$; 74.6%), business (22; 18.6%), government (1; .8%), and other (6; 5.1%). The group included 89 (75.4%) with a doctorate degree, 25 (21.2%) with a Master's degree, and 2 (1.7%) with a Bachelor's degree. Seventy (59.3%) specialized in human resources management, 17 (14.4%) in I/O psychology, 19 (16.1%) in OB, 3 (2.5%) in management, and the remainder in miscellaneous and/or combined areas. As in the previous two mailouts, SMEs' credentials suggest adequate expertise for sorting behavioral elements as a basis for validation.

Measures and Procedure

Study 3 materials and methods are similar to those employed in the previous efforts, especially Study 2 except that competencies were grouped into six clusters based on conceptual interrelatedness rather than randomly. This strategy was intended to make sorting as difficult as possible, thereby providing a more rigorous test of the taxonomy (i.e., if judges can distinguish effectively among the most conceptually related dimensions, then distinctions among all dimensions seem likely also). Clustering was also guided by the practical constraint of presenting roughly equal numbers of competencies to each group of respondents. The competency clusters are specified in the Results section.

Statistical Analysis

The main empirical question was the same as that posed in Studies 1 and 2, namely, the degree to which SME's were able to sort each behavioral element

into its targeted competency. Critical Ns were again determined based on a modification of the binomial test that accounts for increasing chance probabilities for success as sorting proceeds. In addition to meeting the critical N, each element was considered acceptable only if the modal category to which it was assigned was the targeted one. Consistently misclassified elements would suggest the need to reconsider the separability of the competencies involved.

Results

Table 3 contains the results of the sorting task from Study 3. Values in the middle of the table (columns 3 to 5) are the percentages of respondents classifying each element into its targeted competency. In support of these efforts, hit rates are higher on average than those in the two earlier studies (i.e., 68% and 85%, respectively, vs. 88.5% here). This is especially encouraging given that sorting in Study 3, unlike previously, involved competencies clustered on the basis of conceptual relatedness, which made sorting more difficult. In addition, of the total of 159 behavioral elements (i.e., 3×53), only one failed to meet the criteria for acceptability. As indicated in Table 3, the third element in Directing was assigned more often to Coordinating. In a related but marginally acceptable case, the third element in Coordinating was assigned nearly as often to Directing as to its targeted category. Review of these two elements clarifies the grounds for confusion. Directing and Coordinating are related constructs and the third element in each case failed to distinguish clearly between them. Carefully directed modifications to these items and/or the competency definitions would be expected to resolve the problem.

GENERAL DISCUSSION

Results from the third mailout add to those of the first two in support of the proposed taxonomy of managerial competencies. The most unique feature of the taxonomy is its high level of specificity. That expert judges were able to classify behavioral elements into targeted categories with considerable agreement and accuracy supports the continued investigation into the merits of a hyperdimensional understanding of the managerial domain. In particular, the taxonomy is expected to serve as the foundation for job description, performance appraisal, the identification of predictor constructs (e.g., personality traits), and the development of predictor measures (e.g., work sample exercises in a managerial assessment center) in efforts to improve the prediction of managerial performance and matching people to jobs.

The rekindling of the fidelity–bandwidth issue by Ones and Viswesvaran (1996) and their critics (Ashton, 1998; Hogan & Roberts, 1996; Paunonen et al., 1999; Schneider et al., 1996) has prompted renewed consideration of the role of specificity in selection contexts. If greater fidelity is purchased at the cost of re-

TABLE 3
Proportions of Respondents Assigning Behavioral Elements
to Targeted and Nontargeted Competencies

	Mail-Out Cluster[c]	Targeted Competencies[a] Behavioral Element			Nontargeted Competencies[b] Behavioral Element		
		1	2	3	1	2	3
Traditional Functions							
1. Problem Awareness	a	.74	.95	.74			
2. Decision Making	a	.89	.68	.53		.21(17)	.21(17)
3. Directing	a	.84	.89	.21			.26(7)/.21(5) /.21(23)
4. Decision Delegation	b	.79	.84	.95			
5. Short-Term Planning	a	.52	.74	.74			
6. Strategic Planning	a	1.00	.95	.79			
7. Coordinating	a	.84	.68	.47		.21(3)	.42(3)
8. Goal Setting	c	.68	.85	.80			
9. Monitoring	c	.85	.80	.85			
10. Motivating by Authority	c	.95	.85	.90			
11. Motivating by Persuasion	c	.95	.85	.95			
12. Team Building	b	1.00	.58	.68			
13. Productivity	a	.95	.89	1.00			
Task Orientation							
14. Initiative	d	1.00	.90	1.00			
15. Task Focus	d	1.00	1.00	1.00			
16. Urgency	d	1.00	.91	.64			
17. Decisiveness	a	.56	.74	.89	.26(2)	.16(2)	
Person Orientation							
18. Compassion	b	.83	.95	.95			
19. Cooperation	b	.42	.63	.74			
20. Sociability	b	.84	.95	.89			
21. Politeness	b	.67	1.00	.95			
22. Political Astuteness	b	.83	1.00	.67			
23. Assertiveness	a	.79	.74	.89			
24. Seeking Input	b	.89	1.00	.84			
25. Customer Focus	b	.95	1.00	.95			
Dependability							
26. Orderliness	d	.91	.90	.95			
27. Rule Orientation	d	1.00	1.00	1.00			
28. Personal Responsibility	d	.87	1.00	.77			
29. Trustworthiness	d	.96	.86	1.00			
30. Timeliness	d	.95	.95	.86			
31. Professionalism	d	.68	.95	1.00	.22(28)		
32. Loyalty	d	.95	.95	.95			

TABLE 3
(Continued)

	Mail-out Cluster[c]	Targeted Competencies[a] Behavioral Element			Nontargeted Competencies[b] Behavioral Element		
		1	2	3	1	2	3
Open Mindedness							
33 Tolerance	f	1.00	.94	1.00			
34 Adaptibility	f	1.00	1.00	1.00			
35 Creative Thinking	f	1.00	1.00	1.00			
36 Cultural Appreciation	f	1.00	1.00	.94			
Emotional Control							
37 Resilience	f	1.00	1.00	.94			
38 Stress Management	f	1.00	.94	1.00			
Communication							
39 Listening Skills	e	.83	1.00	1.00			
40 Oral Communication	e	.89	.89	.89			
41 Public Presentation	e	.89	.79	.95		.21(40)	
42 Written Communication	e	1.00	1.00	.95			
Developing Self and Others							
43 Developmental Goal Setting	c	.70	.68	.68			
44 Performance Assessment	c	.79	.75	.70			
45 Developmental Feedback	c	.95	.58	.75			
46 Job Enrichment	c	.95	.95	.95			
47 Self-Development	c	.90	1.00	.90			
Occupational Acumen and Concerns							
48 Job Knowledge	f	1.00	.72	1.00		.28(49)	
49 Organizational Awareness	f	1.00	.89	.83			
50 Quantity Concern	e	.95	1.00	1.00			
51 Quality Concern	e	1.00	1.00	1.00			
52 Financial Concern	e	.95	1.00	1.00			
53 Safety Concern	e	1.00	1.00	1.00			
Average		.88	.89	.87			
Min		.42	.58	.21			
Max		1.00	1.00	1.00			

[a]Tabled numbers are proportions of participants classifying the given element into its targeted competency. [b]Tabled numbers are proportions of participants classifying elements into nontargeted competencies. [c]Competencies sharing the same letter were grouped in the same competency set.

duced bandwidth, then the benefits of specificity might also be expected to come at some price. Increased attention to specific subject matter content poses certain challenges in measurement efforts. Most directly, greater specificity can entail having to deal with more numerous constructs. Distinctions that lie at the heart of specificity can become blurred (such as with the third elements of Directing and Coordinating in Study 3), suggesting that there are practical limits to specificity. One way to overcome the greater burden of specificity is to use multiple levels of assessment. In performance appraisal, for example, it would be prudent to prescreen the entire set of competencies for job relevance. This is consonant with the aims of job analysis and offers the opportunity to assess agreement among key players (e.g., targeted managers, their superiors, peers, and subordinates) regarding what is and is not important on the job as a first and important step toward identifying strengths and weaknesses and setting developmental objectives. More specific exemplars would then be assigned, per relevant competency, for assessing managerial performance with the aim of increasing reliability and content representation. To the degree that managerial behavior can be discriminated in terms of function (i.e., role, value to the organization), causes (e.g., KSAO's, situational demands, and their interaction), and assessment (e.g., in performance evaluations), pursuit of greater specificity in considering the managerial domain can be expected to further predictive, theoretical, and developmental objectives.

Our findings speak indirectly, at best, to the dimensionality or structure of observed managerial behavior. It is possible that results of observational studies (e.g., on the job) based on the current taxonomy will reveal fewer dimensions, unique organizations of behavior elements, or both. All elements from certain competencies may be so highly interrelated as to warrant combination as a unitary entity. It is also possible that elements from different competencies will co-vary to yield a structure different from that proposed. Clearly, additional research is needed to answer these questions. It is important to realize, however, that current findings provide direct support for a relatively articulated conceptualization of managerial performance. Weaker support for specificity in observational studies would suggest limits in observational methods (e.g., opportunity to observe, rater ability), which is very different from concluding that managerial performance, as a construct, is inherently general. We encourage observational research based on the proposed taxonomy and offer the current evidence as a basis for comparison in judging the distinctiveness of measured performance dimensions.

Specificity as a Basis for Comparisons Among Taxonomies

An important benefit of specificity is that it provides a common language for comparing behavioral dimensions developed from unique sources. Three sets of

comparisons were undertaken here using the proposed model. The first concerns the 12 previously reported taxonomies, the second provides a mapping with three competency models developed by I/O practitioners, and the last identifies areas of overlap and uniqueness among selected dimensions of leadership. The value of specificity as an integrative tool is demonstrated in each case.

The 12 Source Taxonomies.   The 53 competencies in the revised model are listed in Table 4 with cross-references to the 12 previously reported taxonomies. Source articles often did not provide complete descriptions of the contents of their respective dimensions, which is to be expected given their primary goal of identifying general constructs. An effort was made here to limit cross-references to cases where a competency was clearly identifiable in a prior dimension. This approach probably underestimates the true degree of overlap between the proposed model and its predecessors. Nonetheless, comparisons are noteworthy in several respects.

It is evident that the specific competencies differ in their representation in previous taxonomies. Not surprisingly, those in the "Traditional Functions" category share the most in common with earlier models. That competencies listed under "Person Orientation" have fewer precedents may reflect emerging recognition of management as a people-related activity. In keeping with the use of the previous models as a foundation for current efforts, all but one of the proposed competencies has at least one correlate from a prior model. The exception is Cultural Appreciation, which split off in Study 3 from Tolerance as conceived in Studies 1 and 2 in recognition of the growing need for managers to operate effectively in a global economy. Safety Concern is included in only a single prior dimension (i.e., Luthans & Lockwood's, 1984, "Monitoring/controlling performance"). Four more specific patterns of crossreference warrant consideration.

First, cells containing multiple category numbers suggest that different dimensions in an earlier taxonomy (i.e., column) share a common specific competency (i.e., row). For instance, Goal Setting in the proposed model is part of four dimensions reported by Hemphill (1959). Such cases help pinpoint similarities among the general dimensions reported in previous studies. They also reveal the relative importance of the given competency in different models. All 12 taxonomies, for example, include monitoring, but some (e.g., Borman & Brush, 1993; Hemphill, 1959) emphasize it more than others (e.g., Katzell et al., 1968; Wofford, 1970). Second, the same number appearing in different cells within a given column (i.e., prior model) suggests greater specificity in the current model in articulating that earlier dimension. For example, Hemphill's (1959) "Supervising at Work" includes multiple distinct competencies, including Directing, Short-Term Planning, and Coordinating, among others. This type of comparison shows the dissection of previously reported dimensions into more specific components here. Interestingly,

TABLE 4

Proposed Managerial Competencies with Cross-References to 12 Previous Performance Taxonomies

Proposed Competency	Previous Performance Taxonomy[a]											
	A	B	C	D	E	F	G	H	I	J	K	L
Traditional Functions												
1. Problem Awareness	3	1,2	6				4	1,3	2,8	1,2,3	7,8	1,3,10,13
2. Decision Making		2,5,6	1,3,7,9,10	1,3,5	2,6	1	1,7,8,12	1,3,6		1,2	7,8	6,7,10, 11,13,18
3. Directing	2	6	2,7	5	6	2	3,6,10		1	6,7	7,8	2,3,6,16
4. Decision Delegation	2		3,7	4		5	3		6	1,6,7,9	6,7,8	16
5. Short-Term Planning	1	2,6	2	4,6,7	3,8	1,4	3,4	1	1	1	7,8	1,18
6. Strategic Planning	3		4,6,7	7	1	1	1	1,6	1	1	7,8	1
7. Coordinating	1,2	6	2	1,3,4,6	6	1	2,3,10	2	1	1	7,8	1,7,9,15,16
8. Goal Setting	2		3,6,7,9		1	1,4,5	1,3,4	6	1	1,7	6,7,8	1,2
9. Monitoring	1	2,3	1,2,4,7	1,2	3	5	3,4,9	1,3,6	5	1,2,3	7,8	2,7,15,18
10. Motivating by Authority	1		2,7			2	10	5	6	5	7,8	17
11. Motivating by Persuasion	1,2		2			1		4,5	6	4,5,10	6,7	2,17
12. Team Building	2	6				1,3				1,10	6,7,8	8,9,11
13. Productivity	5,6	8	2	1,2	6	1	10	2	8	2	1,2,4	9,12
Task Orientation												
14. Initiative			6				7				4	
15. Task Focus							11				4,5	12
16. Urgency	3			1		5	4,11			2	4	10,12,13
17. Decisiveness	3		7,10			1,5	8,11,12		8	2	8	10

(Continued)

Person Orientation												
18. Compassion	2								8	8	6	8
19. Cooperation	2,4	7,8	5			3	5	2,5	2	5,8,10,11	6,8	8,16
20. Sociability	2		5	3,5		3	5,10		7,9	10,11	6	5
21. Politeness	5		5,8			3	5		6	8		
22. Political Astuteness			5,8			1	2,5		9	11		
23. Assertiveness	3					1,2,5			6	4	6	17
24. Seeking Input	1,2		1	5		3	7,9		6	3,9,10		18
25. Customer Focus			4,5,8				5		7	11		5
Dependability												
26. Orderliness	1,5		3			1	3,9		4		5	7
27. Rule Orientation	2,4,5	7	3	3			13	2			5	7,14,15
28. Personal Responsibility	3,4	8	8,9		5		4,7	6	6		5	14
29. Trustworthiness	5	8	8,9,10				7,8	3			5	14
30. Timeliness	5										5	1,15
31. Professionalism	5		4,5,8,9		6		5		7	11	5	5
32. Loyalty	4		8,9				5				5	14
Open Mindedness												
33. Tolerance	2,3,5		6,8	7			1		8	8	6	
34. Adaptability	5	8					6,7		8	1		13
35. Creative Thinking	6	1	6				6,7					10
36. Cultural Appreciation												
Emotional Control												
37. Resilience						4	11				4	13,14
38. Stress Management						4	11		8	8		13

(Continued)

TABLE 4
(Continued)

Proposed Competency		A	B	C	D	E	F	G	H	I	J	K	L
							Previous Performance Taxonomy[a]						
Communication													
39. Listening		1								2,8	8	3	4
40. Oral Communication		1		4	3,5	3,5,6		10	3	2,7,8	6,7	3	4
41. Public Presentation		1		5,8				5		7		3	5
42. Written Communication		1	5	4	2,4	3,5,6	1		3	4	6,7	3	4,7
Developing Self and Others													
43. Developmental Goal Setting							5	13	4	3	8	6,7	2,3,11,16
44. Performance Assessment		2	4	5	2,5			13	4	3	3	7,8	2,3,11
45. Developmental Feedback								13	4	3,6		6,7	2,3,11
46. Job Enrichment							5	13	4	6	8,9	6,7	3
47. Self-Development		6				6			4			5	3,6
Occupational Acumen and Concerns													
48. Technical Proficiency		6	1 to 5	3,4	1,2	3,6,7	1	4,6,7				1	6
49. Organizational Awareness				5,8	3	6	4	2	1,2		1	8	9,14
50. Quantity Concern			4	8				9					
51. Quality Concern				8	2,5			4					
52. Financial Concern				3,7,10		3,8		1,3,4,8,12		4		8	15
53. Safety Concern										5			

[a]Letters denote taxonomies and numbers denote performance dimensions within taxonomies, as listed following.

A = Flanagan (1951)
1. Proficiency in handling administrative detail
2. Proficiency in supervising personnel
3. Proficiency in planning and directing action
4. Acceptance of organizational responsibility
5. Acceptance of personal responsibility
6. Proficiency in military occupational specialty

B = Flanagan (1951)
1. Formulating problems and hypotheses
2. Planning and designing the investigation
3. Conducting the investigation
4. Interpreting research results
5. Preparing reports
6. Administering research projects
7. Accepting organizational responsibility
8. Accepting personal responsibility

C = Hemphill (1959)
1. Providing a staff service in non-operational areas
2. Supervising work
3. Providing internal business control
4. Defining technical aspects of products and markets
5. Participating in human, community, and social affairs
6. Initiating long-range planning
7. Exercising broad power and authority
8. Fostering business reputation
9. Demanding behavior
10. Preserving assets

D = Prien (1963)
1. Manufacturing process supervision
2. Manufacturing process administration
3. Employee supervision
4. Manpower coordination and administration
5. Employee contact and communications
6. Work organization, planning, and preparation
7. Union–management relations

H = Morse & Wagner (1978)
1. Managing the organization's environment & resources.
2. Organizing and coordinating
3. Information handling
4. Providing for growth and development
5. Motivating and conflict handling
6. Strategic problem solving

I = Luthans & Lockwood (1984)
1. Planning/coordinating
2. Staffing
3. Training/developing
4. Processing paperwork
5. Monitoring/controlling performance
6. Motivating/reinforcing
7. Interacting with outsiders
8. Managing conflict
9. Socializing/politicking

J = Yukl & Lepsinger (1992)
1. Planning and organizing
2. Problem solving and disturbance handling
3. Monitoring
4. Motivating
5. Recognizing and rewarding
6. Informing
7. Clarifying roles and objectives
8. Supporting
9. Consulting and delegating
10. Conflict management and team building
11. Networking

K = Campbell, McCloy, Oppler, & Sager (1993)
1. Job-specific task proficiency
2. Non-job specific task proficiency
3. Written & oral communication task proficiency
4. Demonstrating effort
5. Maintaining personal discipline
6. Facilitating peer and team performance
7. Supervision/leadership
8. Management/administration

TABLE 4
(Footnotes Continued)

E = Katzell, Barrett, Vann & Hogan (1968)
1. Long-range planning
2. Staffing
3. Technical consultation
4. Budgeting
5. Shared vs. individual responsibility
6. Operational vs. professional concerns
7. Technical vs. administrative activity
8. Controlling

F = Wofford (1970)
1. Order and group achievement
2. Personal enhancement oriented
3. Personal interaction
4. Security and maintenance
5. Dynamic and achievement oriented

G = Tornow & Pinto (1976)
1. Product, marketing, and financial strategy planning
2. Coordinaton of organizational units and personnel
3. Internal business control
4. Products and services responsibility
5. Public and consumer relations
6. Advanced consulting
7. Autonomy of action
8. Approval of financial commitments
9. Staff service
10. Supervison
11. Complexity and stress
12. Advanced financial responsibility
13. Broad personnel responsibility

L = Borman & Brush (1993)
1. Planning and organizing
2. Guiding, directing & motivating subordinates and providing feedback
3. Training, coaching and developing subordinates
4. Communicating effectively and keeping others informed
5. Representing the organization to customers and the public
6. Technical proficiency
7. Administration and paperwork
8. Maintaining good working relationships
9. Coordinating subordinates and others' resources to get the job done
10. Decision making/problem solving
11. Staffing
12. Persisting to reach goals
13. Handling crises and stress
14. Organizational commitment
15. Monitoring and controlling resources
16. Delegating
17. Selling/influencing
18. Collecting and interpreting data

no two general dimensions from different taxonomies break out the same way in the current structure. Third, blank cells suggest competencies lacking a clear reference in the given prior taxonomy. Hemphill's and others' models, for instance, exclude Team Building and Task Focus. Reasons include lack of articulation of the general dimensions in source articles, population idiosyncrasies, and evolving values regarding the importance of selected behaviors. Finally, rows with few numbers reveal competencies that may be less important and/or are specific to certain managerial populations. These dimensions will be of particular interest in the model's continued development.

   Practitioners' Models.   A number of relatively detailed managerial competency models have been developed over the last decade by I/O consulting firms. We ignored such models in preparing our taxonomy largely because we saw the academic literature as offering sufficient grist for the mill with the benefit of peer review. Practitioners' goals, although clearly overlapping with those of researchers, are especially tied to sales and profit. The implications of this for behavior description, organization, and comprehensiveness in taxonomic efforts are not straightforward. Given our research focus, we felt it appropriate to target only academic sources in model development. Comparisons involving practitioners' models can be informative in two important respects. First, it allows further demonstration of the value of specificity as a basis for detailed qualitative analysis. For example, what specific competencies do practitioners' models emphasize and how do they vary in content across models? Second, practitioners may offer unique insight into managerial competence by virtue of their proximity to the "front line." Comparisons with the proposed model could reveal gaps in coverage, thereby directing future research efforts.

   Table 5 summarizes areas of overlap between our model and those provided by three I/O consulting firms, Personnel Decisions, Inc. (PDI), Jeanneret and Associates (JA), and Lominger Limited (LL). These models were identified mostly out of convenience and should not be taken as necessarily representative of all such models. The competency patterns in Table 5 allow inferences similar to those drawn from Table 4. First, each practitioner model emphasizes different competencies. For example, the JA model includes Seeking Input in 6 of its 27 dimensions (22%), compared to 2 out of 38 (5%) in the PDI model and 5 out of 67 (7%) in the LL model. The JA and LL models both stress Adaptability (22% and 15%, respectively, compared to PDI's 5%). LL's model stresses self-development, and PDI's is relatively balanced in terms of the current competencies. Such differences suggest unique values. Second, numbers repeating within columns show how the given practitioner's model is expressed in terms of the proposed model. As with the 12 prior taxonomies, dimensions labeled similarly across models break out uniquely here. Thus, PDI's *Thinking Strategically* includes Strategic Planning, Problem Awareness, Short-Term Planning, and Adaptability, JA's *Strategic*

TABLE 5
Proposed Managerial Competencies With Cross-References to Three Practitioner Taxonomies

Proposed Competency	Practitioner Taxonomy[a]		
	Personnel Decisions, Inc.	Jeanneret & Associates	Lominger Limited
Traditional Functions			
1. Problem Awareness	1, 2, 4, 5, 21, 36	7, 19, 20, 26	3, 12, 45, 46, 47, 50, 51, 56, 58
2. Decision Making	2, 3, 5, 6, 7, 13, 21, 34	7, 13, 19, 24, 26	8, 12, 13, 17, 20, 25, 28, 37, 42, 51
3. Directing	8, 10	5, 8, 15	9, 20, 27, 35
4. Decision Delegation	8	15	18, 27, 35, 36, 59, 60, 63
5. Short-Term Planning	1, 5	4	20, 47, 50, 62
6. Strategic Planning	1, 5, 37, 38	9, 12	5, 28, 46, 58, 65
7. Coordinating	5, 6, 7, 8, 9	4, 12	39, 52, 59
8. Goal Setting	14, 27	8, 9	20, 35, 47
9. Monitoring	8, 35	5, 6, 9, 13, 21, 26	7, 20, 35, 41, 47, 52, 63
10. Motivating by Authority	12	5, 13	22, 34, 53
11. Motivating by Persuasion	12, 14, 16	10, 11, 12, 13, 15	20, 22, 36, 53, 60, 65
12. Team Building	6, 10, 13, 21	8, 9, 12, 13	12, 25, 27, 42, 52, 60
13. Productivity	9, 26	4, 22	43, 50, 53, 62
Task Orientation			
14. Initiative	11, 16	20	1, 6
15. Task Focus	9, 27, 29	19, 21	2, 30
16. Urgency	26	8, 22	13, 16, 62
17. Decisiveness	3, 11	7, 20	1, 2, 9, 12, 13, 16, 34, 40
Person Orientation			
18. Compassion	17		3, 7, 10
19. Cooperation	18, 21	13	37, 42
20. Sociability	17		7, 31
21. Politeness			
22. Political Astuteness	18, 19		31, 37, 38, 48
23. Assertiveness	11, 12, 16	10, 16, 19	34, 37, 42, 57
24. Seeking Input	2, 23	7, 11, 15, 19, 21, 23	3, 9, 36, 51, 60
25. Customer Focus	36	14	15, 63
Dependability			
26. Orderliness			39
27. Rule Orientation		7, 23, 24, 26	22, 41
28. Personal Responsibility	11	7, 20, 23	29, 44, 57
29. Trustworthiness	28	6, 23	15, 29, 37, 42
30. Timeliness	3	4, 6, 22	
31. Professionalism	28, 32	2, 23	
32. Loyalty	37	27	

(Continued)

TABLE 5
(Continued)

Proposed Competency	Practitioner Taxonomy[a]		
	Personnel Decisions, Inc.	Jeanneret & Associates	Lominger Limited
Open Mindedness			
33. Tolerance	4, 20, 21, 23	19, 24, 25	8, 12, 33, 41, 63
34. Adaptability	1, 29	7, 9, 14, 15, 24, 25	2, 8, 11, 32, 40, 45, 48, 49, 54, 63
35. Creative Thinking	4	15, 19, 24	14, 28, 32, 51, 58
36. Cultural Appreciation	20, 38		21
Emotional Control			
37. Resilience	26, 29	21, 22, 24	11, 43
38. Stress Management	29	22	8, 11, 66
Communication			
39. Listening	24	15, 16, 17, 19	3, 7, 12, 20, 33, 41
40. Oral Communication	22	16	20
41. Public Presentation	25		8, 49, 65
42. Written Communication		6, 18	67
Developing Self and Others			
43. Developmental Goal Setting	15	11	19
44. Performance Assessment	15	5, 11	13
45. Developmental Feedback	15	11, 13	19
46. Job Enrichment	15	11	19, 63
47. Self Development	30		4, 6, 32, 45, 54, 55, 61
Occupational Acumen & Concerns			
48. Technical Proficiency	32, 33	1, 2, 3	24
49. Organizational Awareness	18, 33	2, 9, 12	5, 38, 48
50. Quantity Concern	35	5	63
51. Quality Concern	31		
52. Financial Concern	31, 34		53
53. Safety Concern		1	

[a]Numbers denote performance dimensions within taxonomies, as listed in Appendix B.

Planning includes Strategic Planning, Coordinating, Motivating by Persuasion, Team Building, and Organizational Awareness, and LL's *Strategic Agility* includes Strategic Planning, Problem Awareness, and Creative Thinking. The point is not which version is most complete or appropriate but that a set of suitably specified constructs can help pinpoint the overlap and uniquenesses among similarly labeled dimensions. Third, each practitioner model excludes several of the proposed competencies. This may be due to simplified definitions (e.g., from the desire for

brevity), differing values, or both. Fourth, several competencies in the current set were rarely observed in practitioners' models (e.g., Politeness, Orderliness). The importance of these managerial competencies is a matter for future research.

Comparisons with the practitioner models prompts consideration of the comprehensiveness of the proposed model. As suggested in Table 5, our taxonomy captures much of the content of practitioners' dimensions. Nonetheless, several behaviors were identified that are not clearly represented in the current model, including multitasking, knowledge of the industry, and reading and understanding people. Whether these can be added as behavioral elements within existing competencies or warrant consideration as separate competencies requires further study.

Applications in Leadership. The relation between management and leadership is a matter of some debate (Yukl & Van Fleet, 1992). In basing our work on previous efforts, we implicitly adopted the view that part of what managers do is lead. Motivating by persuasion, often considered the essence of leadership (R. Hogan, Curphy, & J. Hogan, 1993), is represented in 8 of the 12 earlier models (see Table 4). Certain other competencies (e.g., Goal Setting, Directing, Monitoring), although less central to leadership, have also been considered under that broad heading. The specificity of the proposed model provides a basis for integrating diverse perspectives in this area. Leadership has often been conceptualized in terms of dichotomous behavioral categories, including, among others, (a) initiating structure (i.e., task orientation) and consideration (i.e., person orientation), (b) autocratic and participative style, and (c), transactional and transformational leadership. Research in these areas is vast, complex, and growing, and summaries are well beyond current aims. Table 6 presents a mapping of the current taxonomy onto the three noted distinctions. The check marks show competencies most clearly aligned with the given leadership dimension. They are mutually exclusive within column pairs but show overlap in competencies between pairs. For example, both initiating structure and autocratic leadership include Directing, and both participative and transformational leadership include Decision Delegation. Two mutually exclusive clusters can be identified: initiating structure, autocratic style, and transactional leadership, on the one hand, and consideration, participative style, and transformational leadership, on the other. Although pairs within clusters share two to four competencies, the dimensions are notably unique, as might be expected given their relatively independent conceptual and empirical foundations.

The question here is not the degree to which the selected leadership dimensions individually allow decomposition into managerial competencies, but rather how well the nature of diverse constructs within a broad research domain like leadership can be elucidated using a suitably articulated taxonomy of behavior. Content linkages like those portrayed in Table 6 may be helpful in integrating research

TABLE 6
Distinctive Competencies for Selected Leadership Styles

Competency	IS	CON	AU	PAR	TRANS	TRANSF
Traditional Functions						
1. Problem Awareness						√
2. Decision Making						
3. Directing	√		√			
4. Decision Delegation				√		√
5. Short-Term Planning	√					
6. Strategic Planning						√
7. Coordinating	√					
8. Goal Setting	√				√	
9. Monitoring	√		√		√	
10. Motivating by Authority			√		√	
11. Motivating by Persuasion						√
12. Team Building		√		√		√
13. Productivity	√					
Task Orientation						
14. Initiative						√
15. Task Focus	√					
16. Urgency	√					
17. Decisiveness						√
Person Orientation						
18. Compassion		√				√
19. Cooperation		√		√		
20. Sociability						√
21. Politeness		√				
22. Political Astuteness						√
23. Assertiveness						√
24. Seeking Input				√		
25. Customer Focus						
Dependability						
26. Orderliness						
27. Rule Orientation	√		√		√	
28. Personal Responsibility						
29. Trustworthiness		√				
30. Timeliness	√					
31. Professionalism						
32. Loyalty						
Open Mindedness						
33. Tolerance		√		√		
34. Adaptability						
35. Creative Thinking						√
36. Cultural Appreciation		√				

(Continued)

TABLE 6
(Continued)

Competency	IS	CON	AU	PAR	TRANS	TRANSF
Emotional Control						
37. Resilience						
38. Stress Management						
Communication						
39. Listening				√		
40. Oral Communication						√
41. Public Presentation						√
42. Written Communication						
Developing Self and Others						
43. Developmental Goal Setting		√				√
44. Performance Assessment						
45. Developmental Feedback		√				√
46. Job Enrichment						√
47. Self-Development						
Occupational Acumen and Concerns						
48. Technical Proficiency						
49. Organizational Awareness						
50. Quality Concern	√					
51. Quantity Concern	√					
52. Financial Concern	√					
53. Safety Concern		√				

Note. IS = Initiating Structure; CON = Consideration; AU = Autocratic; PAR = Participative; TRANS = Transactional; TRANSF = Transformational.

findings and identifying uncharted domains. This is especially relevant in the study of leadership (and management), given the complexity of factors involved and the corresponding diversity of approaches taken in this area (Yukl & Van Fleet, 1992). Applications readily extend beyond those shown in Table 6. Transformational leadership, for example, has been conceptualized in different ways by different researchers (Bass, 1985; Burns, 1978; Conger & Kanungo, 1987; House, 1977). The competencies listed in the far right column of Table 6 are an amalgam across perspectives. The proposed model, or some similarly specified set of dimensions, could prove valuable as a framework for comparisons within this area.

In an attempt to advance thinking and research into the use of specific managerial performance constructs, we offer the competency definitions in Appendix A. The advantages of content specificity (i.e., regarding competencies) may be promoted by deriving behavior elements specific to a given organization or job. We welcome such efforts. A potential disadvantage, however, would be the loss of comparability among applications of the taxonomy. Those using the model as a

basis for more context-specific research are encouraged to assess the validity of their translations in the process (e.g., using SMEs or on the basis of behavioral observation). Of particular concern would be the identification of exemplars uniquely classifiable under the targeted competency (e.g., as assessed here). This is no small undertaking in light of the opportunity for classification into alternative competencies.

CONCLUSIONS

Scientific investigation combines analysis and synthesis in the pursuit of knowledge. Our goal was not to lessen appreciation for general, complex dimensions of managerial behavior but rather to call attention to the potential for distinguishing among related behaviors and show that greater construct specificity may be sustainable in studies of managerial performance than has been realized in the past. The current taxonomy is offered as a basis for more detailed inquiry into the nature of managerial performance as a multidimensional construct. In particular, it provides a foundation for the development of competency-based, possibly contextspecific, job analysis and performance evaluation systems, as well as the identification of key predictor constructs and training needs. We also advocate its use in exploring the possibility that managerial behaviors differ in their organization as a function of situational factors (e.g., level, function, industry). Such pursuits are expected to guide improvements in the fit between individual managers and the demands of management and promote more precise and complete understanding of the nature and bases of managerial effectiveness.

ACKNOWLEDGMENTS

REFERENCES

Ashton, M. C. (1998). Personality and job performance: The importance of narrow traits. *Journal of Organizational Behavior, 19,* 289–303.

Ashton, M. C., Jackson, D. N., Paunonen, S. V., Helmes, E., & Rothstein, M. G. (1995). The criterion validity of broad factor sales versus specific facet scales. *Journal of Research in Personality, 29,* 432–442.

Bass, B. M. (1985). *Leadership and performance beyond expectations.* New York: Free Press.

Borman, W. C., & Brush, D. H. (1993). More progress toward a taxonomy of managerial performance requirements. *Human Performance, 6,* 1–21.

Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection* (pp. 71–98). San Francisco: Jossey-Bass.

Borman, W. C., & Motowidlo, S. J. (1997). Task performance and contextual performance: The meaning for personnel selection research. *Human Performance, 10,* 99–109.

Bunce, D., & West, M. A. (1995). Self-perceptions and perceptions of group climate as predictors of individual innovation at work. *Applied Psychology: An International Review, 44,* 199–215.

Burns, J. M. (1978). *Leadership.* New York: Harper & Row.

Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 1, pp. 39–74). Palo Alto, CA: Consulting Psychologists Press.

Campbell, J. P. (1994). Alternative models of job performance and their implications for selection and classification. In M. G. Rumsey, C. B. Walker, & J. H. Harris (Eds.), *Personnel selection and classification* (pp. 33–51). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). A theory of performance. In N. Schmitt & W. C. Borman (Eds*.), Personnel selection in organization* (pp. 35–70). San Francisco: Jossey-Bass.

Chi, M. T. H., Glaser, R., & Farr, M. J. (1988). *The nature of expertise.* Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Conger, J. A., & Kanungo, R. (1987). Toward a behavioral theory of charismatic leadership in organizational settings. *Academy of Management Review, 12,* 637–647.

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78,* 98–104.

Cronbach, L. J., & Gleser, G. C. (1965). *Psychological tests and personnel decisions.* Urbana: University of Illinois Press.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52,* 281–302.

Driskell, J. E., Hogan, J., Salas, E., & Hoskin, B. (1994). Cognitive and personality predictors of training performance. *Military Psychology, 6,* 31–46.

Flanagan, J. C. (1951). Defining the requirements of the executive's job. *Personnel, 28,* 28–35.

Guion, R. M., & Gottier, R. F. (1965). Validity of personality measures in personnel selection. *Personnel Psychology, 18,* 135–164.

Harris, M. (1998). Competency modeling: Viagraized job analysis or impotent imposter? *The Industrial–Organizational Psychologist, 36,* 37–41.

Hemphill, J. K. (1959). Job descriptions for executives. *Harvard Business Review, 37,* 55–67.

Hogan, J., Hogan, R., & Murtha, T. (1992). Validation of a personality measure of job performance. *Journal of Business & Psychology, 7,* 225–236.

Hogan, J., & Roberts, B. W. (1996). Issues and nonissues in the fidelity–bandwidth tradeoff. *Journal of Organizational Behavior, 17,* 627–637.

Hogan, R., Curphy, G. J., & Hogan, J. (1993). What we know about leadership. *American Psychologist, 49,* 493–504.

Hough, L. M. (1992). The "Big Five" personality variables—Construct confusion: Description versus prediction. *Human Performance, 5,* 139–155.

House, R. J. (1977). A 1976 theory of charismatic leadership. In J. G. Hunt & L. L. Larson (Eds.), *Leadership: The cutting edge* (pp. 189–207). Carbondale: Southern Illinois University Press.

Jackson, D. N. (1970). A sequential system for personality scale development. In C. D. Spielberg (Ed.), *Current topics in clinical and community psychology* (Vol. II, pp. 61–95). New York: Academic.

Jackson, D. N. (1994). *Jackson Personality Inventory–Revised manual.* Port Huron, MI: Research Psychologists Press.

Katzell, R. A., Barrett, R. S., Vann, D. H., & Hogan, J. M. (1968). Organizational correlates of executive roles. *Journal of Applied Psychology, 52,* 22–28.

Klein, G. A. (1989). Recognition-primed decisions. In W. B. Rouse (Ed.), *Advances in man–machine system research* (Vol. 5, pp. 47–92). Greenwich, CT: JAI.

Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological Reports, 3*(Monograph No. 9), 635–694.

Luthans, F., & Lockwood, D. L. (1984). Toward an observation system for measuring leader behavior in natural settings. In J. G. Hunt, D. Hosking, C. Schreisheim, & R. Stewart (Eds.), *Leaders and managers: International perspectives on managerial behavior and leadership* (pp. 117–141). New York: Pergamon.

Morse, J. J., & Wagner, F. R. (1978). Measuring the process of managerial effectiveness. *Academy of Management Journal, 21,* 23–35.

Murphy, K. R. (1994). Toward a broader conception of jobs and job performance: Impact of changes in the military environment on the structure, assessment, and prediction of job performance. In M. G. Rumsey, C. B. Walker, & J. H. Harris (Eds.), *Personnel selection in organizations* (pp. 85–102). San Francisco: Jossey-Bass.

Murphy, K. R., & Shiarella, A. H. (1997). Implications of the multidimensional nature of job performance for the validity of selection tests: Multivariate frameworks for studying test validity. *Personnel Psychology, 50,* 823–854.

Ones, D. S., & Viswesvaran, C. (1996). Bandwidth–fidelity dilemma in personality measurement for personnel selection. *Journal of Organizational Behavior, 17,* 609–626.

Paunonen, S. V., Rothstein, M. G., & Jackson, D. N. (1999). Narrow reasoning about the use of broad personality measures for personnel selection. *Journal of Organizational Behavior, 20,* 389–405.

Prien, E. P. (1963). Development of a supervisor description questionnaire. *Journal of Applied Psychology, 47,* 10–14.

Raymark, P. H., Schmit, M. J., & Guion, R. M. (1997). Identifying potentially useful personality constructs for employee selection. *Personnel Psychology, 50,* 723–736.

Robertson, I., Gibbons, P., Baron, H., MacIver, R., & Nyfield, G. (1999). Understanding management performance. *British Journal of Management, 10,* 5–12.

Schippmann, J. S., Prien, E. P., & Hughes, G. L. (1991). The content of management work: Formation of task and job skill composite classifications. Journal of *Business and Psychology, 5,* 325–354.

Schneider, R. J., Hough, L. M., & Dunnette, M. D. (1996). Broadsided by broad traits: How to sink science in five dimensions or less. *Journal of Organizational Behavior, 17,* 639–655.

Shannon, C., & Weaver, W. (1949). *The mathematical theory of communication.* Urbana: University of Illinois Press.

Tett, R. P. (1998). Is Conscientiousness ALWAYS positively related to job performance? *The Industrial–Organizational Psychologist, 36,* 24–29.

Tett, R. P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A metaanalytic review. *Personnel Psychology, 44,* 703–742.

Tett, R. P., Jackson, D. N., Rothstein, M., & Reddon, J. R. (1994). Meta-analysis of personality–job performance relations: A reply to Ones, Mount, Barrick, and Hunter (1994). *Personnel Psychology, 47,* 157–172.

Tett, R. P., Jackson, D. N., Rothstein, M., & Reddon, J. R. (1999). Meta-analysis of bidirectional relations in personality–job performance research, *Human Performance, 12,* 1–29.

Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology, 46,* 259–293.

Thornton, G. C., III. (1992). *Assessment centers in human resource management.* Reading, MA: Addison-Wesley.

Tornow, W. W., & Pinto, P. R. (1976). The development of a managerial job taxonomy: A system for de-
    scribing, classifying, and evaluating executive positions. *Journal of Applied Psychology, 61,*
    410–418.
Wofford, J. C. (1970). Factor analysis of managerial behavior variables. *Journal of Applied Psychology,*
    54, 169–173.
Yukl, G. A., & Lepsinger, R. (1992). An integrating taxonomy of managerial behavior: Implications for
    improving managerial effectiveness. In J. W. Jones, B. D. Steffy, & D. W. Bray (Eds.), *Applying*
    psychology in business: The manager's handbook (pp. 563–572). Lexington, MA: Lexington Press.
Yukl, G. A., & Van Fleet, D. D. (1992). Theory and research on leadership in organizations. In M. D.
    Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed.,
    Vol. 3, pp. 147–197). Palo Alto, CA: Consulting Psychologists Press.

Appendix A

Managerial Competencies and Definitions

Traditional Functions

1. Problem Awareness: Perceives situations that may require action to promote organizational success.
2. Decision Making: Uses good judgment in resolving problems.
3. Directing: Clearly specifies to subordinates what needs to be done.
4. Decision Delegation: Assigns true decision-making authority to qualified subordinates.
5. Short-term Planning: Prepares the steps needed to complete tasks before action is taken.
6. Strategic Planning: Develops long-term plans to keep the organization aligned with future demands.
7. Coordinating: Organizes the activities of subordinates and the allocation of resources.
8. Goal Setting: Identifies organizational work unit objectives and the methods for achieving them.
9. Monitoring: Compares current work unit progress to predetermined standards, objectives, and deadlines.
10. Motivating by Authority: Influences subordinates directly using rewards and/or punishments.
11. Motivating by Persuasion: Persuades others to achieve excellence for its own sake.
12. Team Building: Identifies and integrates distinct subordinate roles in a spirit of collaboration.
13. Productivity: Accomplishes goals set by self or others.

Task Orientation

14. Initiative: Takes preliminary steps to do what needs to be done without direction.
15. Task Focus: Stays on task despite complexity and/or ambiguity.
16. Urgency: Responds quickly to pressing organizational demands.
17. Decisiveness: Does not hesitate in making tough decisions.

Person Orientation

18. Compassion: Shows genuine concern for the welfare of others.
19. Cooperation: Seeks to accomplish work goals through collaboration with others.
20. Sociability: Initiates and energetically maintains friendly interactions with others inside and outside of work.
21. Politeness: Demonstrates proper manners when dealing with others.
22. Political Astuteness: Takes advantage of political relationships and the distribution of power in pursuing goals.
23. Assertiveness: States views confidently, directly, and forcefully.
24. Seeking Input: Actively pursues others' contributions to work-related discussion.
25. Customer Focus: Seeks to maintain or enhance customer satisfaction.

Dependability

26. Orderliness: Maintains a high degree of organization in his or her physical work environment.
27. Rule Orientation: Realizes the importance of organizational rules and policies, and willingly follows them.
28. Personal Responsibility: Accepts responsibility for own actions, decisions, and directions to subordinates.
29. Trustworthiness: Maintains confidentiality in dealing with sensitive information about the company, its customers, and/or its workers.
30. Timeliness: Shows appreciation for and abides by routine job-related time limits.
31. Professionalism: Demonstrates the standards of his or her career or occupational group.
32. Loyalty: Shares the company's goals and values.

Open Mindedness

33. Tolerance: Values judgments different from his or her own.
34. Adaptability: Readily adapts to new situations and immediate work demands.
35. Creative Thinking: Fosters creative thinking within the organization or work unit.
36. Cultural Appreciation: Appreciates diversity in cultural experiences and/or beliefs.

Emotional Control

37. Resilience: Maintains a positive attitude in response to failure.
38. Stress Management: Deals effectively with feelings of job-related stress and their causes.

Communication

39. Listening Skills: Actively attends to what others are saying.
40. Oral Communication: Expresses thoughts verbally in a clear, pleasant, and straightforward manner.
41. Public Presentation: Is effective and comfortable in presenting material to groups of people.
42. Written Communication: Expresses self clearly and succinctly in writing (e.g., by letter or memo).

Developing Self and Others

43. Developmental Goal Setting: Collaborates with individual subordinates to establish work objectives for their career advancement.
44. Performance Assessment: Evaluates individual co-workers' performance with respect to their personal developmental objectives.
45. Developmental Feedback: Gives regular, specific, and timely feedback to subordinates in relation to personal goals.
46. Job Enrichment: Gives employees learning opportunities to expand job-related expertise.

47. Self-Development: Seeks out and engages in self-improvement opportunities.

Occupational Acumen and Concerns

48. Technical Proficiency: Knows what it takes to do the job.
49. Organizational Awareness: Knows how the organization works as a whole and in terms of individual work units.
50. Quantity Concern: Works to meet or exceed existing organizational quotas.
51. Quality Concern: Works to meet or exceed existing quality standards.
52. Financial Concern: Understands the importance of generating and saving money for the organization.
53. Safety Concern: Emphasizes accident prevention at the workplace.

APPENDIX B

Performance Dimensions Within Practicioners' Taxonomies

Personnel Decisions, Inc.
1. Think Strategically
2. Analyze Issues
3. Use Sound Judgment
4. Innovate
5. Establish Plans
6. Structure and Staff
7. Develop Systems & Processes
8. Manage Execution
9. Work Efficiently
10. Provide Direction
11. Lead Courageously
12. Influence Others
13. Foster Teamwork
14. Motivate Others
15. Coach and Develop
16. Champion Change
17. Build Relationships
18. Display Organizational Savvy
19. Leverage Networks
20. Value Diversity
21. Manage Disagreements
22. Speak Effectively
23. Foster Open Communication
24. Listen to Others
25. Deliver Presentations
26. Drive for Results
27. Show Work Commitment
28. Act with Integrity
29. Demonstrate Adaptability
30. Develop Oneself
31. Use Financial and Quantitative Data
32. Use Technical/Functional Expertise
33. Know the Business
34. Manage Profitability

Jeanneret & Associates
1. Technical Knowledge
2. Business Knowledge
3. Procedural Knowledge
4. Planning, Prioritizes and Schedules
5. Task Supervision
6. Administrative Organization
7. Decision Making
8. Instructing
9. Alignment with Organization
10. Persuasion and Influence
11. Coaching
12. Strategic Planning
13. Promoting Teamwork
14. Teams with Customers
15. Leading Teams
16. Oral Communication
17. Listening
18. Written Communication
19. Negotiating
20. Initiative
21. Perseverance
22. Stress Tolerance
23. Integrity
24. Objectivity
25. Adaptability
26. General Reasoning Ability
27. Organizational Commitment

Lominger Limited
1. Action Oriented
2. Dealing with Ambiguity
3. Approachability
4. Boss Relationships
5. Business Acumen
6. Career Ambition
7. Caring About Direct Reports
8. Comfort Around Higher Management
9. Command Skills
10. Compassion
11. Composure
12. Conflict Management
13. Confronting Direct Reports
14. Creativity
15. Customer Focus
16. Timely Decision Making
17. Decision Quality
18. Delegation
19. Developing Direct Reports
20. Directing Others
21. Managing Diversity
22. Ethics and Values
23. Fairness to Direct Reports
24. Functional/Technical Skills
25. Hiring and Staffing
26. Humor
27. Informing
28. Innovation Management
29. Integrity and Trust
30. Intellectual Horsepower
31. Interpersonal Savvy
32. Learning on the Fly
33. Listening
34. Managerial Courage
35. Managing and Measuring Work
36. Motivating Others
37. Negotiating

Personnel Decisions, Inc.
  (Continued)

35. Commit to Quality
36. Focus on Customer Needs
37. Promote Corporate
     Citizenship
38. Recognize Global
     Implications

Lominger Limited
  (Continued)

38. Organizational Agility
39. Organizing
40. Dealing with Paradox
41. Patience
42. Peer Relationships
43. Perseverance
44. Personal Disclosure
45. Personal Learning
46. Perspective
47. Planning
48. Political Savvy
49. Presentation Skills
50. Priority Setting
51. Problem Solving
52. Process Management
53. Drive for Results
54. Self-Development
55. Self-Knowledge
56. Sizing Up People
57. Standing Alone
58. Strategic Agility
59. Management Through
     Systems
60. Building Effective Teams
61. Technical Learning
62. Time Management
63. TQM/Re-engineering
64. Understanding Others
65. Managing Vision and
     Purpose