The Elusiveness of Applied Management Knowledge: A Critical Challenge for Management Educators

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Abstract:

A wealth of anecdotal data suggest that, despite sufficient conceptual knowledge of what constitutes effective management practice, managers may often lack the ability to apply that knowledge in *context*. We measured the applied managerial knowledge of 21,319 managers and 2,644 students and found a disturbingly low level of such capability in both groups. Moreover, our findings indicated little difference in demonstrated applied managerial knowledge across a wide range of management experience. In our student sample, we found only modest to small relationships between applied managerial knowledge and measures of cognitive aptitude, select personality characteristics, and academic performance. Despite an immense amount of educational resources devoted to its development, applied managerial knowledge is clearly elusive. We discuss implications for future research and more effective management education.

Keywords: Management competencies | Management skills | Management education | Management development

Article:

Scholars in several different professional disciplines increasingly are focusing attention on the

distinctions between *conceptual knowledge*—knowledge of principles and procedural guidelines—and the ability to apply such knowledge in authentic contexts. The general thrust of such work is that conceptual knowledge traditionally has been disproportionately weighted in the

selection, development, and evaluation of professionals. In contrast, the ability to apply such knowledge to practical tasks in authentic contexts has been undervalued. In recognition of this asymmetry, the Law School Admissions Council recently sponsored a project called "Looking Beyond the LSAT" (Schultz & Zedeck, 2008) with the intention of identifying and assessing a wider range of predictors of lawyer effectiveness. Comparable projects in the field of medicine are underway to more fully understand the characteristics and competencies possessed by the most effective doctors vis-à-vis the highest achieving medical students (Epstein, 2002; Groopman, 2007; Lievens, Ones, & Dilchert, 2009).

In a similar vein, management scholars have demonstrated increased interest in uncovering the applied capabilities of effective managers—particularly those of a noncognitive nature. The explosion of attention devoted to concepts such as emotional and practical intelligence (Goleman, 1998; Sternberg, 2006; Wagner & Sternberg, 1985) is consistent with a long-standing acknowledgment that there is something more to being an effective manager than conceptual knowledge (as in practicing law or medicine). The search for the competencies of highly effective managers has also gained momentum from a burgeoning body of evidence that has linked effective management with positive organizational outcomes, such as employee attraction, engagement, retention, and productivity (Harter, Schmidt, & Hayes, 2002; Huselid, 1995; Pfeffer & Veiga, 1999).

Despite ample evidence that management competence has high value for individuals and organizations alike, a variety of reports suggest that such competence remains the exception rather than the rule. For example, roughly 50% of American respondents to workforce surveys have reported that they are less than satisfied with their current manager—and many have noted that the very *worst* aspect of their job is their immediate supervisor (Buckingham & Coffman, 1999). Other studies have shown that fewer than 25% of managers regularly manifest the fundamentals of effective management, such as providing clear expectations and goals, involving others in decisions that affect them, and coaching by way of regular feedback (Tulgan, 2007). Similarly, scholars working with the Center for Creative Leadership and others have found that lack of managerial skill is the most frequent derailer of careers and that roughly 50% of people who take management roles essentially fail (Carens, Cottrell, & Layton, 2004; McCall, Lombardo, & Morrison, 1988; Shipper & Dillard, 2000). Even with the explosion of interest and focus on emotional intelligence and noncognitive elements of management effectiveness in the last 15 years, there remains little empirical evidence that there has been any substantive aggregate improvement in managerial effectiveness in our workplaces (Cherniss, 2010; Mintzberg, 2004; Zeidner, Roberts, & Matthews, 2008).

The precise metrics matter less than the simple realization that the perceived level of management effectiveness is certainly much lower than management educators would deem acceptable. Given the importance of management competence and the immense amount of educational resources devoted to its development, how can the reports from the front be so dismal? Are those who decry the sorry state of management and the ubiquity of "toxic" organizations (Mintzberg, 2004; Pfeffer & Sutton, 2000) correct in their pessimistic assessment of applied managerial knowledge? Conversely, is the reported level of dysfunction perhaps an

example of negativity bias (Ito, Larsen, Smith, & Cacioppo, 1998) whereby dysfunction and bad examples are made disproportionately salient, and the average levels of performance are not really as low as the anecdotal accounts would suggest?

With those questions in mind, we had three objectives for our work here. First, we sought to empirically establish a base rate of applied management knowledge. Although anecdotal accounts abound, actual empirical evidence, collected on representative samples with reliable measures, is sparse. To this end, we took advantage of a large existing sample of practicing managers—from varied industries, firms, and organizational levels—to empirically assess the state of applied management knowledge. Second, we aimed to test whether managerial level is positively correlated with applied management knowledge. A common intuitive assumption, and one largely substantiated by prior evidence (McDaniel, Schmidt, & Hunter, 1988; Quiñones, Ford, & Teachout, 1995; Sturman, 2003), is that applied management knowledge, much more than conceptual knowledge, is largely a function of experience. If that is true, then those at higher managerial levels will typically have substantially more applied management knowledge than those at lower levels. Third, we aimed to explore how applied management knowledge relates to more widely used predictors of achievement, such as cognitive aptitude, personality, and conceptual knowledge.

APPLIED MANAGEMENT KNOWLEDGE

Applied management knowledge (AMK) is the awareness and understanding of principles that enable an individual to analyze a management situation, identify the important issues involved, and choose appropriate managerial actions. Our conception of AMK derives from the perspective of *knowledge-in-use* (de Jong & Ferguson-Hessler, 1996) which suggests that "task performance forms the basis for the identification of relevant aspects of knowledge" (105). As depicted in Figure 1, we specifically distinguish AMK from traditional conceptions of conceptual (often referred to as declarative) and procedural knowledge.

Conceptual knowledge (know *that*), is "static knowledge of facts" (de Jong & Ferguson-Hessler, 1996: 107) and is often colloquially referred to as "book smarts." In management contexts, conceptual knowledge would include recognition and understanding of management principles, terms, and theories. Procedural knowledge (know *how*), "is represented by actions or manipulations that are valid within a domain" (de Jong & Ferguson-Hessler, 1996: 107). Procedural knowledge is distinct from conceptual knowledge in that it requires demonstration that one can actually *do* a task—not just know its principles or concepts. In management contexts, procedural knowledge would include giving developmental feedback or mediating a conflict situation. Both conceptual and procedural management knowledge can be demonstrated in decontextualized settings (e.g., traditional written exams, interviews, behavior modeling), and therefore, we refer to both as decontextualized knowledge.

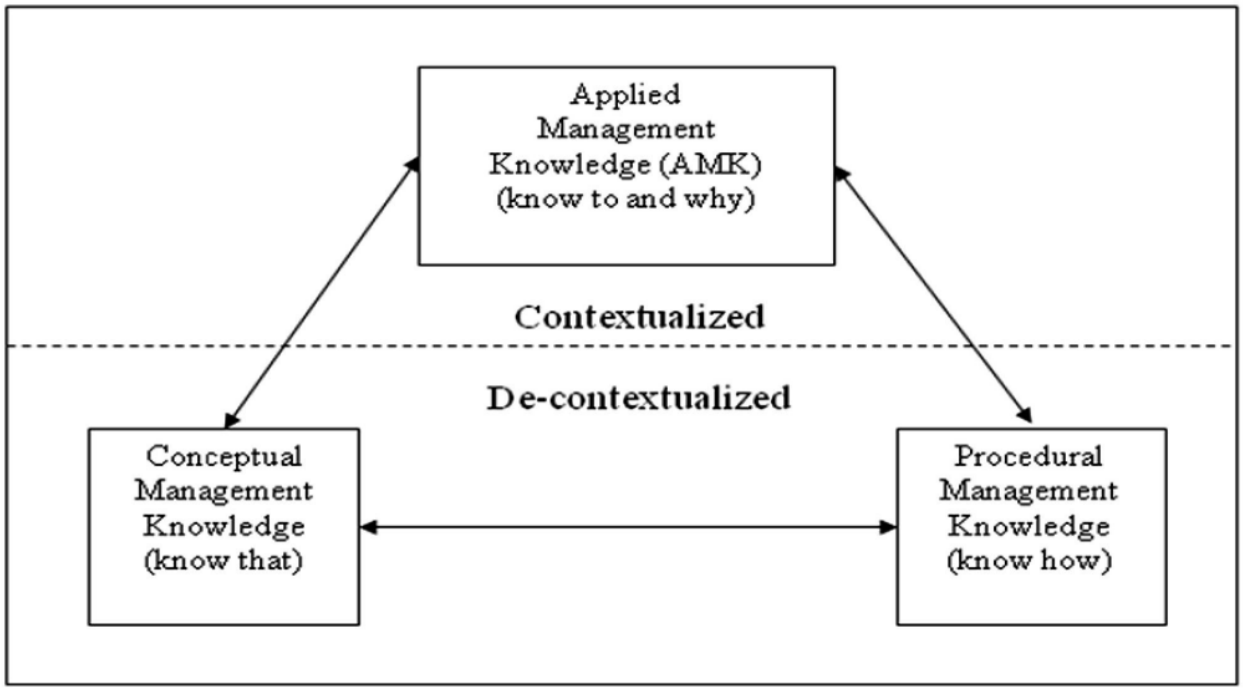

Figure 1. Types of Management Knowledge

Applied management knowledge (AMK) is distinct from simple declarative and procedural knowledge in that it goes beyond knowing how to effectively execute management actions to also include determination of when and under what circumstances it would be appropriate to take such actions. It is what learning researchers refer to as conditional or situational knowledge: "knowledge about dealing with situations as they typically appear in a particular domain" (de Jong & Ferguson-Hessler, 1996: 107). Put another way, AMK determines how well managers identify and execute proper courses of actions in contextual situations, without directions or response cues, amidst the noise and competing demands that typically characterize authentic management roles.

The notion of applied competence is certainly not new, and this definition is conceptually similar to what prior authors (cf. Bigelow, 1991; Hedlund, Forsythe, Horvath, Williams, Snook, & Sternberg, 2003; McEvoy, 1998) have termed tacit knowledge or management skill or "action skill." However, our definition (and measurement) of AMK subsumes those categorizations because it represents both the capability to perform an action and an explicit understanding of why the action is appropriate in a particular context. The term *knowledge* is apt because it is the knowledge of when and why to take action that allows for effective behavior in context, and for ultimate generalization to other contexts. In contrast with conceptual and procedural knowledge, assessing individual AMK requires assessment in authentic management contexts. Thus, we also describe AMK as contextualized knowledge.

It is also worth noting that, like all types of knowledge, qualitative distinctions exist between individuals' levels or depth of AMK (cf. de Jong & Ferguson-Hessler, 1996). For example, a distinction can be made between fundamental and expert applied management knowledge.

Fundamental AMK is the ability to demonstrate effective action when confronted with common and recurring people management situations in an evaluation context. Expert AMK is proficiency in taking appropriate actions in actual management roles and across the full range of management situations—including novel and unusual ones.

To illustrate our knowledge distinctions with an analogy from the field of medicine, medical students demonstrate their conceptual knowledge of human anatomy and healthy appendix functioning by taking written examinations. In turn, they demonstrate their procedural knowledge by conducting a supervised and prediagnosed standard appendectomy on a cadaver or model. Demonstrating fundamental applied knowledge, however, requires that they diagnose a set of selected patients and determine which, if any, should be scheduled for a standard appendectomy (or other procedures), explain why each decision is warranted, and then demonstrate the ability to perform the surgery successfully. Expert applied knowledge would be demonstrated by a record of effective diagnoses and positive patient outcomes over time and the ability to handle unusual or novel cases that arise.

As noted earlier, distinctions regarding conceptual and applied knowledge are hardly new (Alexander, Schallert, & Hare, 1991; de Jong & Ferguson-Hessler, 1996). Popular taxonomies distinguish different levels of learning (Bloom, 1956; Gagne, Briggs, & Wager, 1992), and transfer of training researchers have long recognized the concept of transfer "distance" and made distinctions between near and far transfer (Barnett & Ceci, 2002; Holton & Baldwin, 2003). Indeed, there is universal agreement that the transfer of decontextualized or conceptual knowledge to contextualized application is challenging to achieve and perhaps the single most formidable challenge in all learning and education (Bransford, Brown, & Cocking, 1999; Haskell, 2001). The transfer problem has been found to be acute in many learning domains including the development of generic workplace skills (Stasz & Brewer, 1999) and cross-cultural agility (Ceci & Roazzi, 1994). A recurring conclusion of researchers across learning domains is that successful transfer requires more than just good content and pedagogy—it must also involve some link to the social context of application.

Specifically with respect to the transfer of management knowledge, a number of influential scholars have lamented that relationships between formal classroom management education and demonstration of those skills on the job are disturbingly low (Bennis & O'Toole, 2005; Gammie, 1995; Mintzberg, 2004). Indeed, research has shown that even when the management training has been explicitly skill based, and the pedagogy practical and application oriented, the transfer of management knowledge is elusive (McEvoy, 1998; Raynis & Johnson, 1992). Put another way, even under the best of training circumstances, the inhibitors to transfer of management knowledge are great.

Moreover, there has been recurring concern related to the question of whether there is a commonly understood body of knowledge and action that would qualify management as a profession (Khurana, 2007; Mintzberg, 2004). In the case of medical doctors, accountants, attorneys, and so forth, entrants to the profession are required to show mastery of a common body of knowledge. Those who have reached professional standing in their disciplines have had to demonstrate that they "know the basics" by way of passing scores on bar exams or medical

boards or the CPA. In contrast, Mintzberg (1975, 2005), Khurana (2007) and others have argued that management does not rise to the level of a profession because no such commonly accepted level of mastery of AMK has been specified. That is, it is unreasonable to expect a consistent level of understanding and behavioral responses related to a body of knowledge that has not yet been codified, trained, and reinforced in the first place. Given our access to a large and representative sample of practicing and aspiring managers, who have all completed a standardized measure of management fundamentals, our work here amounts to an empirical test of whether a common base of knowledge in our managerial population exists.

POTENTIAL CORRELATES OF APPLIED MANAGEMENT KNOWLEDGE

With respect to the transfer of AMK, conventional wisdom suggests that some factors may be positively associated with such transfer. The most prominent of those factors include experience as a manager, conceptual knowledge, and individual differences in cognitive aptitude and personality.

Managerial Experience

Although examples of successful managers with little or no experience certainly exist, research evidence has supported the intuitive notion that there is a positive relationship between work experience and job performance across a wide range of job types (Quiñones et al., 1995; Sturman, 2003). Sturman's meta-analytic findings are particularly compelling and further reveal that the relationship between experience and job performance is even stronger as job complexity increases, and people management jobs are certainly complex (cf. Fine, 1955). Moreover, the findings of Anders Ericsson, and colleagues (cf. Ericsson & Lehmann, 1996) suggest that complex applied skills generally emerge as a result of dedicated commitment and deliberate practice more than as a function of any innate gift or predisposition. Thus, it seems reasonable to expect that AMK is largely a function of both type and time of experience in a management role.

Conceptual Knowledge

Although it is axiomatic that some initial acquisition of knowledge is necessary for transfer (Bransford et al., 1999; Carey & Smith, 1993; Chi, 2000), it is noteworthy that many failures to produce transfer (in a variety of contexts) have resulted from inadequate opportunities for students to learn effectively in the first place. Attention to initial learning is important, as it has been shown that the type and nature of that learning are key to transfer. Based on our collective experience in classroom and management training contexts, we suspect that fundamental management principles are generally well-understood, and that practicing managers and students alike often do know a relatively comprehensive set of effective management principles. Presuming that knowing is prerequisite to doing, it is reasonable to expect that general conceptual managerial knowledge does correlate with applied knowledge. Indeed, theories of reasoned and planned behavior (Ajzen, 1985; Fishbein & Ajzen, 1975; Madden, Ellen, & Ajzen, 1992) suggest that knowledge is consequential to mental processes of recognizing, judging, and forming behavioral intentions regarding situations. Thus, relevant conceptual knowledge should inform each process and potentially lead to superior applied outcomes.

On the other hand, evidence suggests that rote learning often does not tend to facilitate transfer, as the learner may simply be memorizing isolated facts with little opportunity to organize learned material in any meaningful fashion (cf. de Jong & Ferguson-Hessler, 1996). Indeed, researchers have recently questioned the validity of models of planned behavior based on the suspicion that many people may lack either the willingness or ability (or both) to process environmental cues and determine behavioral responses (e.g., Sonenshein, 2007). If individuals lack the motivation, cognitive resources, or processing time necessary to apply their knowledge and determine the best course of action, then they may ultimately choose suboptimal strategies and behaviors. This is often colloquially referred to as the inability to "act in the moment" or "do it when it counts." Ample anecdotal evidence suggests this phenomenon is ubiquitous in management contexts.

For instance, listing the rules of effective performance evaluation and feedback is quite simple. However, deciding how to approach an upset employee, "blind to her own weaknesses," and getting her to get beyond defensiveness and commit to a personal improvement plan, is a more complex and challenging matter—even though the basic principles may be known. Similarly, fundamental models of motivation are simple and straightforward. But transferring an understanding of those models to effectively coach a person who has become disinterested and lackadaisical in his work is a more daunting task. It is, therefore, entirely possible that even those who fully "know" and understand effective management principles may still be unable to put them into action in authentic contexts.

Individual Differences

In their recent meta-analysis, Blume, Ford, Baldwin, and Huang (2010) found that select individual characteristics did moderately predict training transfer. More specifically, they found cognitive aptitude, and the Big-Five personality dimension of conscientiousness were most related to transfer across contexts. Thus, we expect that such familiar variables may be antecedent to AMK as well. Cognitive aptitude has a long history of relationships with many important workplace variables (Ree & Earles, 1991; Schmidt & Hunter, 1998) and evidence in support of the relationship between personality and performance in a variety of domains, including management, has been rapidly emerging (Barrick, Mount, & Judge, 2001; Judge, Bono, Ilies, & Gerhardt, 2002).

SUMMARY

Acquiring applied management knowledge is a more formidable challenge than simple declarative or procedural knowledge and yet is a key to the effectiveness of practicing managers. The extant literature and anecdotal accounts suggest that AMK is low—but empirical evidence is limited. In this study, we were interested in three primary research questions: (1) What is the base rate of AMK among samples of practicing managers and students? (2) How does experience as a manager relate to AMK? (3) How do conventional antecedents of workplace performance, such as conceptual knowledge, cognitive aptitude, and personality characteristics, relate to AMK? Understanding the level, nature, and antecedents of AMK is important to those engaged in efforts to select and develop management talent.

METHODS

Sample and Procedure

Our study includes two distinct samples. The first consists of 21,319 practicing managers, or aspiring managerial job candidates, who completed our in-basket measure of AMK (described below) over the past 25 years. That sample includes subjects from 75 diverse private sector companies, including small- to medium-sized organizations, as well as *Fortune*-500 companies, and approximately 270 local or state government entities in the United States and Canada. The sample's participants were 63.6% male, 18.7% female, and 17.7% unreported and included a substantial number of managers at different organizational levels.

Access to the first sample was obtained by way of a professional relationship with the purveyor of our in-basket measure. Approximately 70% of the sample's participants completed our in-basket measure in assessment centers or as part of other multipart selection processes. The remaining candidates completed the in-basket as a singular test for selection or promotion purposes. All candidates took the paper-and-pencil version of the assessment until approximately 2002, when the electronic (on-line) version of the test was introduced. Electronic usage has steadily increased and today approximately 95% of all tests are completed on-line. Comparisons of on-line responses versus paper-and-pencil responses revealed no material differences in the quality or quantity of work completed.

Our second sample consisted of 2,644 upper-level (junior or senior standing) undergraduate students enrolled in a required management class at a large midwestern university, who completed the electronic version of our in-basket measure of AMK as part of a course requirement. The student sample had a mean age of 21 years, and 66% of participants were male. A subset of 308 students in this sample completed a set of additional measures to enable testing of research questions related to individual differences. All students completed the on-line version of the in-basket, and their scores were included in the calculation of their final course grade.

Measures

Applied Management Knowledge

We measured AMK using an in-basket assessment exercise known as the Managerial Skills Assessment Test (MSAT). The MSAT is the short form of the larger General Management In-Basket (GMIB; Joines, 2007). The MSAT consists of eight common, fundamental management scenarios: (1) How and when to involve others in decisions, (2) Evaluating and managing new ideas proposed by subordinates, (3) Dealing with a poor performing employee, (4) Delegating responsibility and holding others accountable (5), Making group meetings effective (6), Coaching for better performance (7), Dealing with important constituents external to the organization, and (8) Managing conflict that jeopardizes important organizational outcomes.

Although AMK could potentially be measured in different ways, we were drawn to in-basket exercises in general, and the MSAT in particular, for several reasons. First, such exercises place candidates in authentic management contexts and allow for systematic observation and scoring of their performance (Thornton & Byham, 1982). More specifically, a candidate taking an in-basket examination assumes the role of a manager in a hypothetical organization and is asked to

respond to correspondence that has supposedly accumulated in that manager's in-basket. Candidates are asked to respond to the items just as though they were the manager. That means that they must prioritize their tasks and complete the actions they believe are most critical in the time allotted—just as real managers do on a daily basis.

Second, the MSAT's eight situations are consistent with the most well-known management-skill taxonomies (Eichinger & Lombardo, 1990; Whetten & Cameron, 2006). Indeed, all eight scenarios represent common situations faced by managers at all levels. While we make no claim that the MSAT assesses the full or definitive set of all fundamental managerial knowledge, there is no debate that the knowledge required to score well on the MSAT is core and fundamental to success in most any managerial role.

Third, we were acutely aware that unreliability in scoring and demonstrated lack of construct validities across dimensions have precluded more widespread usage of in-baskets and similar assessment-center exercises (Sackett & Dreher, 1982; Schippman, Prien, & Katz, 1990); however, the design and scoring of the MSAT is relatively unique in the domain of assessment center exercises and overcomes a number of limitations associated with traditional in-basket assessments (Joines, 1991, 2007).

More specifically, successful completion of *each MSAT item* requires understanding of one or more management principles or concepts. For each of the eight items in the MSAT, candidates must respond by (1) identifying the important issues, (2) describing the actions they would take to be most effective, and (3) actually taking those actions (write memos, follow-up notes, etc.) where appropriate. Thus, while the MSAT uses an in-basket format, each item is designed to be a stand-alone event and is scored independently. The item response format reveals how well candidates understand and react to the management principles or concepts that are at issue in *each item*. That means that they have to be able to execute the action and also know when to do so and why they chose to do so—all without any response cues or prompts. Such capability is the essence of AMK.

This approach is significantly different from that of traditional in-baskets, which are generally scored by reviewing the candidate's actions across all items, then deconstructing (or rating) the candidate's performance by the dimensions (skills) being evaluated—with no requirement for the candidate to demonstrate his understanding of the principles or concepts embedded in any given item, or to demonstrate why certain actions were taken. Thus, unlike self-report surveys, multiple-choice tests, situational judgment instruments (that provide response options), or traditional in-baskets, the MSAT is designed to capture true AMK. That is, not just procedural or conceptual or decontextualized knowledge, but how well an individual applies knowledge in responding to specific, actual managerial problems *without* response options or cues.

Trained evaluators manually score all responses using documented protocols which have consistently produced high interrater reliability (r = .92, Joines, 2007). Evaluators are certified by way of a training process that consists of roughly 4 hours of training and scoring practice per item. All points on the rating scale are explicitly anchored for each of the eight situations on a precisely defined 4-point rating scale (0–4). The highest score, (4), is for superior

understanding/excellent action plan and execution. The midpoint, (2), represents minimally satisfactory understanding/action, while the lowest score, (0), denotes a lack of understanding/ ineffective action. For each subject in this study (manager or student), individual item scores are reported as well as the sum of those eight item scores to get a total MSAT test score. Therefore, given that each item is scored on a 0–4 scale, 32 points is the maximum possible overall MSAT score.

The GMIB (of which the MSAT is a subset) has consistently shown impressive relationships to measures of on-the-job management performance. One study, which included subjects drawn from across 120 different management positions at several hierarchical levels, yielded estimated true validity coefficients of .41 and .44 for the GMIB in predicting composite on-the-job performance ratings by immediate and next-higher level supervisors (reported in Conoley & Impara, 1995).

While we believe the MSAT is an appropriate measure of AMK, it is important not to overstate the case. That is, no claim is made that the MSAT is a comprehensive assessment of all relevant managerial competencies or that it taps *expert* management proficiency. As noted earlier, expert knowledge is only demonstrated by way of consistent performance on the job and over time. In contrast, the MSAT facilitates evaluation of candidates only in fundamentally simple, commonly occurring management situations. The rationale behind using the MSAT as a criterion here is that if candidates lack the knowledge sufficient to handle the most fundamental and commonly occurring management situations in an evaluation context, they will be unlikely to excel in actual management situations—and the validation evidence supports that. Our contention, therefore, is that AMK is necessary, though likely not sufficient, for expert management performance on the job.

Note that since the MSAT is proprietary and used for selection purposes, the actual items must remain confidential. However, the Appendix to this article presents a sample item, an overview of the scoring protocol, and brief guidance on developing in-basket items to measure AMK. More information regarding the MSAT is available from the authors on request.

Management Experience

Given the information available in our database, management level was used as a proxy for experience. Although the actual length of experience of candidates in our managerial sample was not reported, the hierarchical level of the position applied for is no doubt a good indication of experience. As a practical matter, candidates for higher level positions generally have more career experience than those applying for lower level positions. The in-basket administrator determined management level at the time of assessment and categorized assessees into one of five categories (0–4). Level 0 is reserved for students or others who are not yet qualified for a full-time management position. Level 1 designates candidates for entry-level management positions. Level 2 includes midlevel managers (e.g., second level of the hierarchy, such as police lieutenant where sergeant is the first level). Level 3 designates candidates for senior management positions (typically an assistant department director or comparable position). Level 4 is the

highest level and designates candidates for department director or higher positions (e.g., finance director, city manager, or CEO).

Conceptual Knowledge

In our student sample, we measured conceptual knowledge in two ways: (1) self-reported cumulative grade point average (GPA), and (2) composite exam score in the required management course of the undergraduate business curriculum. GPA is the most widely used proxy for conceptual knowledge and is referred to colloquially as "book smarts." Prior scholars who compared self-reported GPA with official university registrar records found that students do reliably report their GPAs ($r = .93$, $p < .01$; Rode et al., 2005).

The composite exam score was comprised of student score on three multiple-choice exams used to evaluate performance in the required management course. All exams consisted of 75 questions with mean scores of approximately 60 correct items on each exam. Since the course covers traditional management principles and topics (Baldwin, Bommer, & Rubin, 2008), we deemed the composite exam score to be an appropriate proxy for conceptual knowledge of management.

Cognitive Aptitude

Cognitive aptitude (i.e., general mental ability) of the student subsample was measured using the Wonderlic Personnel Test (WPT, 1992), a 50-item, 12-min test. Each correct response earns one point, and incorrect or missing responses are neither penalized nor rewarded. Previous research has found the WPT to be both a reliable and valid measure of cognitive ability (Dodrill, 1983; McKelvie, 1989). Wonderlic scores correlate positively with other accepted measures of intelligence such as the Wechsler Adult Intelligence Scale ($0.85 < r\text{s} < 0.93$; Dodrill, 1981; Dodrill & Warner, 1988).

Personality

In accord with the most widely accepted protocol for measuring personality, we used the international personality item pool (IPIP) which is a web-based and publicly available measure of the Big-Five personality dimensions (Goldberg, 1992). More specifically, we used the 100-item short version of the IPIP to measure extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (Goldberg et al., 2006).

RESULTS

MSAT Total and Item Scores

Table 1 reports means and standard deviations for MSAT items and total scores for the entire sample of managers and students. Results are reported as raw scores out of 4 points for each item (32 total) and as percentages of total possible points.

Table 1. Managerial Skills Assessment Test

Item	Mean[a]	*N*	*SD*
1	1.93 (48.25%)	20,963	1.14
2	1.33 (33.25%)	19,997	0.92

3	1.54 (38.50%)	20,772	1.23
4	0.77 (19.25%)	19,312	1.01
5	1.03 (25.75%)	19,439	1.03
6	1.31 (32.75%)	18,630	1.15
7	1.18 (29.50%)	20,713	0.99
8	1.17 (29.25%)	16,462	1.01
Total	1.28 (32.06%)	19,536	1.06

n = 23,963 (21,319 managers; 2,644 students). [a] Items not attempted excluded from analyses.

Overall, our data reflect a low level of AMK among practicing and aspiring managers. As reported in Table 1, assessees earned below 30% of the possible total (32) and below 50% of the possible points (4) for each item on average. Additionally, performance varied widely as indicated by the large standard deviations. In short, assesses failed to achieve minimally satisfactory levels on all items. It should be noted, moreover, that these scores reflect the upper estimate on each facet of AMK. We excluded nonattempted items from our calculations of means, standard deviations, and correlations (hence the varying sample sizes) rather than score them as zeros. We chose this approach since a nonattempt does not necessarily reflect a deficiency in AMK. While insufficient AMK may explain a nonresponse—so could lack of time. As seen in Table 1, the least attempted items (6 and 8) came later in the sequence than the most attempted (1 and 3).

In relative terms, assessees performed best on item 1 (involving others in decisions) and worst on item 4 (delegating and keeping others accountable). They performed comparably better on items 2 (evaluating and managing new ideas proposed by subordinates), 3 (dealing with poor performance), and 6 (coaching for better team interactions and performance) than items 5 (making meetings effective), 7 (dealing with external constituents), and 8 (managing conflict relevant to organizational outcomes).

One final note is that the scores of managers have been relatively stable over time. Manager mean item scores in 2008 compared to 1997 demonstrate a slight deterioration for a few of the MSAT management situations (likely due to an increase in the number of lower level managers tested) but, overall, the scores are comparable.

Managerial Experience and AMK

We found that AMK had a weak association with experience as measured by managerial level. To determine if experience differentiated performance on the MSAT, we performed a MANOVA using managerial level as the categorical variable. Although managerial experience did correspond with higher overall performance ($F = 417.61$, $p < .001$), the overall effect size for experience was quite modest ($\eta^2 = .07$). Planned contrasts revealed relatively small differences between managerial levels. As illustrated in Figure 2, there was a 1.14 point (3.5%) difference between undergraduates and entry level managers, a 1.53 point (4.8%) difference between entry-level managers and middle managers, a 0.38 point (1.2%) difference between middle managers and senior managers, and a 1.04 point (3.3%) difference between senior managers and executives in terms of average performance (all *p*s < .001 arguably due to our large sample; Combs, 2010).

Although the results displayed in Figure 2 reveal a clear upward linear trend in the relationship between MSAT performance and experience (r =.25, p < .001), the strength of the relationship is far lower than conventional wisdom might predict. In substantive terms, the highest level (presumed most experienced) assessees still missed 68% of the possible MSAT points on average. Conversely, one quarter of the relatively inexperienced students showed above average AMK. Moreover, it should be noted that the top-performing student earned a spot in the 99th percentile of all assesses with 20 points (six less than the best overall performer). Given that the MSAT has an open response format, such performance cannot be attributed to luck or guessing, and this finding is therefore intriguing.

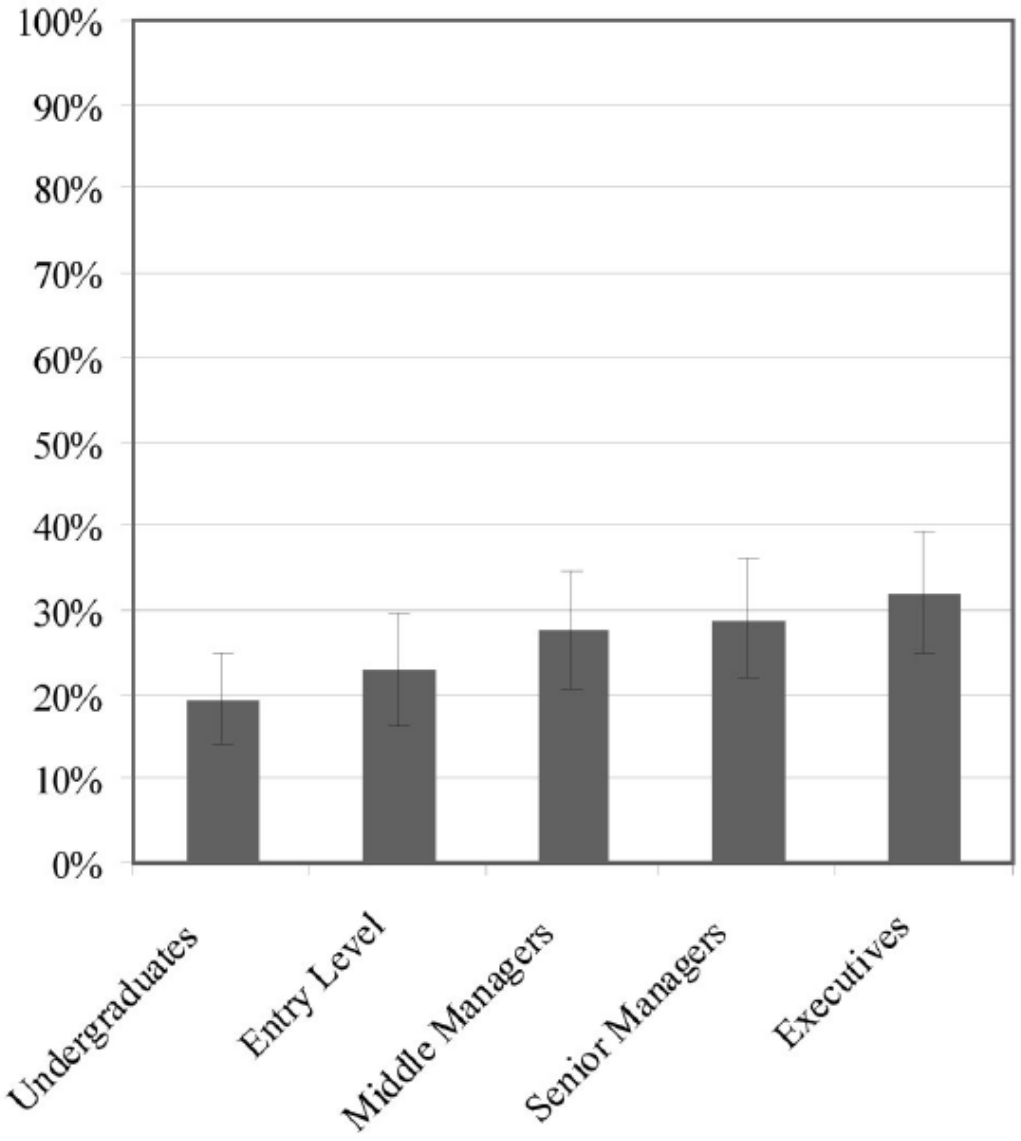

FIGURE 2. Overall MSAT Performance by Experience ± 1 Standard Deviation

Finally, to determine if experience may have more impact in some areas of AMK than others, we inspected the relationship between experience and individual MSAT items. This inspection

revealed that experience had negligible effects on performance on the individual items. Effect sizes (η^2s) averaged .02 with a range from .00 to .04. To rule out the possibility that students presented a special case, we excluded them and reran the analyses. The effect sizes became even weaker. In sum, experience had minimal impact on managers' understanding of how to handle various management situations.

Individual Differences and AMK

We explored other potential determinants of AMK beyond experience. First, we correlated our measures of conceptual knowledge (GPA and exam scores), cognitive aptitude, and personality with the overall score on the MSAT and its items. As seen in Table 2, all of our measures correlated with some aspects of MSAT performance, but none correlated with all items.

Conceptual knowledge, as measured by GPA and course exam scores, was modestly associated with MSAT performance. Overall MSAT performance correlated with the former (r = .17, p < .01) and the latter (r = .25, p < .001). Although the high correlation between these two measures (r = .58, p < .001) supports our operationalization of conceptual knowledge in these terms, their correspondence to the individual MSAT items differed. GPA correlated positively with items 1 (decision making), 2 (evaluating and managing new ideas proposed by subordinates), and 5 (making meetings effective), whereas exam performance correlated with 1 (decision making), 5 (making meetings effective), 7 (dealing with external constituents), and 8 (managing conflict relevant to organizational outcomes).

Of the remaining individual differences, cognitive aptitude had the strongest association with MSAT performance (r = .24, p < .001). However, like conceptual knowledge, the association was not universal. Cognitive aptitude corresponded with only a subset of MSAT items (item 2 and items 5–8).

Table 2. Correlates of Applied Management Knowledge

Variables	*M*	*SD*	*MSAT Total*	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Sex[a]	Age	Cognitive Aptitude	GPA	Course Exams	Extra-version	Agree-ableness	Conscien-tiousness	Neuroticism	Openness to Experience
MSAT total	6.47	3.49	—																		
Item 1	1.32	1.01	.41***	—																	
Item 2	.83	0.92	.40***	.02	—																
Item 3	.94	1.15	.43***	.12*	.03	—															
Item 4	.35	0.91	.34***	−.02	−.02	.04	—														
Item 5	.99	1.16	.50***	.05	.14**	.08†	.09†	—													
Item 6	.59	0.91	.45***	.06	.06	.08†	.02	.10*	—												
Item 7	.96	1.00	.44***	.10*	.09†	−.05	.06	.05	.12*	—											
Item 8	.47	0.94	.51***	.06	.12*	.04	.11*	.11*	.21***	.20***	—										
Sex[a]	1.56	—	−.06	.04	−.06	−.04	−.02	.04	−.14*	.00	−.03	—									
Age	3.88	0.68	−.10†	−.03	.01	−.04	−.04	−.04	−.05	−.04	−.08†	.18***	—								
Cognitive Aptitude	25.83	4.94	.24***	.07	.12*	.01	.00	.16**	.13*	.18***	.17**	.06	−.14*	—							
GPA	3.30	0.33	.17***	.10*	.11*	.07	.02	.18***	−.03	.06	.07	.04	−.09†	.23***	—						
Course Exams	79.88	7.97	.25***	.14*	.09	.09	.04	.17**	.08	.14*	.14*	.06	−.04	.26***	.58***	—					
Extraversion	3.60	0.67	.14**	.04	.06	.10*	−.01	−.03	.21***	.06	.06	−.09†	.01	.02	−.12*	−.03	—				
Agreeableness	3.87	0.53	.17***	.08†	.07	.12*	.00	.04	.24***	.03	.02	−.26***	−.02	.06	−.11*	−.03	.48***	—			
Conscientiousness	3.66	0.61	.04	.04	.03	.04	.02	−.01	−.05	.00	.04	−.04	−.11*	.03	.13*	.10†	.01	.19***	—		
Neuroticism	3.45	0.67	.08†	.08†	.05	−.03	−.01	.04	.13*	.01	.02	.23***	−.01	.17**	−.05	.01	.37***	.25***	.02	—	
Openness to Experience	3.66	0.52	.16**	.07	.12*	.09†	.02	.02	.10*	.08†	.07	.07	.05	.29***	.11*	.19***	.44***	.32***	.09†	.33***	—

Note. Student sample only (N = 308). [a] Coded 1 for female and 2 for male (N = 270). † p < .10, * p < .05, ** p < .01, *** p < .001.

In addition, each individual personality dimension except conscientiousness corresponded with performance on the MSAT. Three of the Big-Five dimensions (extraversion, agreeableness, and openness to experience) had modest, but significant correlations with total MSAT score ($.14 \leq r \leq .17$, $p < .01$). In particular, personality was most associated with items 3 and 6. Item 6 (coaching for better team interactions and performance) correlated positively and significantly with extraversion ($r = .21$, $p < .001$), agreeableness ($r = .24$, $p < .001$), neuroticism ($r = .13$, $p < .05$), and openness to experience ($r = .10$, $p < .05$). Item 3 (dealing with a poorly performing employee) also had modest associations with extraversion and ($r = .10$, $p < .05$) and ($r = .12$, $p < .05$). Openness to experience was most associated with item 2 (evaluating and managing new ideas proposed by subordinates; $r = .12$, $p < .05$).

Few demographic factors correlated with MSAT performance. Women performed somewhat better than men on item 6 (coaching for better team interactions and performance). In addition, age had a marginally negative relationship with overall MSAT score. However, these relationships become nonsignificant after partialing out agreeableness and cognitive aptitude, respectively.

Finally, to better understand how these correlates may predict AMK, we performed a multivariate regression. We regressed MSAT total and item scores on cognitive aptitude, exam scores, and the Big-Five personality dimensions. We chose to include exam scores over GPA because they have a more direct link to the knowledge domain of management. We reported the model results and standardized (beta) coefficients in Table 3. Taken together, the individual traits that scholars and practitioners traditionally associate with manager potential explain relatively little of the variance in AMK. The model explained 13% of the variance in the MSAT total score, 9% of the variance in item 6, and 5% or less of the variance in the other items. This outcome supports our claim that AMK is a unique predictor of managerial performance. Additionally, controlling for the various traits showed cognitive aptitude, conceptual knowledge (i.e., exam scores), and only one personality trait, agreeableness as the best predictors of overall performance on the MSAT. Note that while agreeableness predicted performance on item 6, all other relationships between the Big-Five personality dimensions and MSAT item scores became nonsignificant.

Table 3. Regression Models of Applied Management Knowledge

	Dependent variables								
Independent variables	MSAT total	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8
1. Cognitive aptitude	.13*	.01	.01	.02	-.12*	.12*	.12†	.14*	.15*
2. Course Exams	.23***	.15*	.06	.09	.08	.16**	.05	.09	.10
3. Extraversion	.07	.01	-.02	.09	-.02	-.05	.10	.05	.08
4. Agreeableness	.13*	.06	.03	.09	.03	.07	.20**	-.01	-.03
5. Conscientiousness	.02	.06	.00	.02	.04	-.05	-.08	-.01	-.06
6. Neuroticism	.00	.10	-.01	-.12†	.01	.03	.08	-.03	-.02

7. Openness to Experience	.01	-.03	.11	.03	.04	-.05	-.07	.02	-.01
Model R^2	.13***	.04†	.02	.04	.02	.05*	.09***	.04	.05†

Note. Standardized coefficients reported. † p < .10, *p < .05, **p < .01, ***p < .001.

DISCUSSION

The findings that stand out most in this study are (1) the arrestingly low level of demonstrated applied management knowledge in large and representative samples of managers and students; (2) some patterns of variance across AMK dimensions; (3) the modest positive increment in applied management knowledge associated with management experience; and (4) the modest correlations of applied management knowledge with cognitive aptitude, personality, and declarative knowledge. In this discussion we first elaborate on the nature and importance of our major findings. We then discuss some limitations of our work and several implications of our findings for future research and the enhancement of management learning and education.

Findings

Low Overall AMK Scores

First and foremost, the present results leave little question that there are, in fact, substantive gaps in the applied knowledge of both practicing and aspiring managers. Faced with common management scenarios designed to elicit the most fundamental of applied knowledge, managers and students alike largely failed to reach even the midpoint scores of the assessed items. Several points are important in interpreting those scores.

First, the in-basket items used as the criteria in this study do not require any type of specialized knowledge, nor are they nuanced or "tricky" in any way. Just like the sampled item illustrated in the Appendix to this article, all the items depict straightforward situations for which conventional management doctrine offers clear prescriptions.

Second, the scoring standards were not artificially high, nor was mastery required to achieve a top score on any item. In fact, observers (e.g., fellow management professors and corporate human resource management executives) shown the items and scoring key did not consider the items difficult and routinely expressed the view that scores would meet or exceed the item midpoints, yet as shown in Table 1, the mean item score is only 1.28.

Finally, the context of assessment is one that promotes high extrinsic *motivation* among test-takers. The managers in this sample were all assessed for selection or administrative purposes, and thus, personal career implications were at stake. Students took the in-basket test primarily for development purposes, but also received a grade associated with their score.

When first reviewing the MSAT as a possible measure of AMK, we were concerned that scores would be substantively inflated compared to actual management performance. That is, even though the assessment uses authentic situations and has high fidelity with management work, it is still a simulated context, and candidates do not ultimately have to carry out the actions they commit to on the test. This suggested to us that candidates might contrive actions they would not

actually commit to on the job and thereby inflate their scores—perhaps even more so because they knew they were being tested explicitly on their demonstrated management knowledge. However, given that the actual scores revealed no such inflation, we are left with the disappointing realization that many of the candidates did not even know enough to contrive (i.e., fake) effective responses. In any case, the low levels of observed scores prompt us to conclude that, however straightforward and desirable AMK may be, it is also curiously elusive.

Returning to our earlier discussion of debates regarding management as a profession (Khurana, 2007; Mintzberg, 2004), this set of findings suggests that management, as currently practiced, has not risen to that level. That is, if most or all managers understood the fundamental principles and concepts of management and how to apply them to common situations, then we would expect to see most handle the same situations similarly—just as we expect doctors who are treating a case of influenza to take similar treatment actions. No such pattern was observed here.

One other noteworthy finding was that some select students achieved overall applied management scores that were roughly as high as the highest scoring practicing managers. This is consistent with the finding that experience was not a determinant of applied knowledge. However, it also prompts questions concerning the antecedents of such preternaturally high knowledge. Recalling the well-known axiom that any performance is a multiplicative function of ability, motivation, and opportunity (Blumberg & Pringle, 1982; Dunnette, 1966), we wonder to what extent the high-scoring student "outliers" have substantively different profiles on those elements than their less knowledgeable counterparts.

Gladwell (2008) has made some fascinating observations regarding outliers in a number of contexts, and he argues persuasively that the "right stuff" of success is less the innate personal characteristics of individuals and more the social and environmental preconditions enjoyed by some more than others. That notion has important implications for how management educators create learning contexts that induce higher AMK. For example, scholars in the area of college student development (cf. Magolda, 2000) now emphasize the importance of multiple domains of development—not just cognitive—and point to the potential importance of thinking beyond the classroom (e.g., living-learning communities, extracurricular work, the social milieu) for inculcating applied knowledge.

Variance Across AMK Dimensions

While the overall MSAT scores were consistently low, there was also considerable variance across items, and some patterns in that variance comprise our second set of interesting findings. For example, the general area in which managers demonstrate their highest mean AMK score pertains to the appropriate involvement of subordinates in decision making (e.g., in a situation where those subordinates have knowledge pertinent to the decision, will be responsible for execution of the decision, etc.). This is the area in which students also performed best. While it is important to note that the item scores were hardly stellar for either managers or students, the relative strength on this dimension suggests that knowledge of where and when to engage others in decision making (Vroom & Yetton, 1973) may be modestly making its way into our managerial population.

On the other end of the spectrum, both managers and students demonstrate their lowest mean AMK scores in the area of delegating responsibility and holding others accountable. Response patterns show that both groups demonstrate a strong tendency to accept upward delegations and engage in actions that promote the dependency of subordinates. Moreover, they are inclined to quickly opt for the use of authority over influence and to neglect opportunities to provide support and coaching to their associates. For example, on the one item most directly related to holding people accountable for their work, and not accepting upward delegation, the mean AMK score was .77, with 65% of the assesses scoring less than the item midpoint and only 6% scoring above it.

Having now observed thousands of actual candidate responses to MSAT items, we wonder if many practicing and aspiring managers are taking actions that they think are appropriate, but that are based on some inaccurate stereotypical conceptions of what makes for a good manager. For example, with respect to holding others accountable, some portion of the low scores are due to actions that reflect a manager trying to "be tough" and acting in very autocratic ways—with little information gathering or concern for the underlying causes of poor performance. For others, low scores are obtained by trying to "be nice" but ultimately letting poor performers slide in ways that shift work to higher performers and create a toxic sense of unfairness. In neither case are they acting in ways known to be most effective in creating healthy and high-performing workplaces—nor in ways that they would be likely to respond to favorably if they were the subordinates. In his well-known simulated prison studies, Zimbardo and colleagues (Haney, Banks, & Zimbardo, 1973) showed just how easily individuals assume roles of which they have some stereotypical assumptions. It seems that a similar phenomenon may well be happening in MSAT assessments, and ultimately on the job as well.

Experience and AMK

Our third noteworthy finding was that experience, so intuitively critical to managerial effectiveness, had only a modest relationship with applied knowledge scores. While there was a clear linear increase in performance associated with management level, it certainly was not of the magnitude we expected—and the raw scores of even the highest (level 4) managers were still disturbingly low. Although many tested managers had multiple years of experience, our data suggest that such experience by itself is not the determinant of AMK.

We suspect that what these results reveal is a distinction between quantity (i.e., time) and quality (i.e., type) of experience (cf. Quiñones et al., 1995). Even those widely associated with the importance of practice and experience do not advocate unqualified experience. For example Ericsson and others clearly explicate that deliberate practice is not just repeating a task, but rather obtaining feedback from an expert source and concentrating as much on technique as on outcome. Put another way, the adage that "practice makes perfect" is only a half-truth. A more precise and accurate conception is that deliberate practice with *informed feedback* makes perfect. Since it is open to debate how much guided practice with feedback most practicing managers (or students) enjoy, it would be presumptive to assume that unqualified experience in a manager role necessarily makes for a higher level of management effectiveness. At the very least, these results soften the blanket statement that "experience is the best teacher"—at least for management

acumen. Experience without deliberate practice and rich diagnostic feedback may actually reinforce the wrong behaviors and could even make for *less* effective behavior patterns over time Dubois and McKee (cited in Quiñones et al., 1995; Thompson & DeHarpport, 1994). The prevalence of toxic and dysfunctional organizational environments (Pfeffer & Sutton, 2000; Sutton, 2007) may further attenuate the relationship between experience and management performance. Assuming managers "manage the way they were managed" (Bandura, 1986) and that their models of management do not themselves possess AMK (and the present evidence suggests that they often do not), then managers are unlikely to acquire AMK through experience.

Individual Traits and AMK

Our final finding of interest stems from our student sample, where we found modest relationships between AMK and cognitive aptitude, select personality characteristics, and student cumulative GPA. Our profile of results are consistent with the growing body of evidence suggesting that both cognitive and noncognitive characteristics can and do relate to managerial effectiveness across organizational contexts (Hogan, Hogan, & Murtha, 1992; Schmidt & Hunter, 2000). The positive relationships with cognitive aptitude and agreeableness are conceptually meaningful and empirically consistent with prior work in this domain (Hogan et al., 1992).

At the same time, although the observed relationships are nontrivial, they are of only limited use in predicting management effectiveness. For example, cognitive aptitude did have a significant zero-order correlation with overall MSAT score, but it explained only 6% of the variance in AMK. Moreover, students' *conceptual* knowledge of management (i.e., GPAs and composite exam scores) explained less than 7% in predicting AMK. In contrast, GPA and composite exam scores shared nearly 35% of their variance. This means that our most common selection criteria (GPA and SAT) are relatively good predictors of achievement in management education, but not such good predictors of actual management performance.

In this regard, traditional methods of assessing candidates for education in business have been focused largely on predicting academic success. However, the present results suggest that traditional academic success, which emphasizes mastery of facts (i.e., conceptual knowledge), is not highly predictive of applied performance. Acknowledging this very phenomenon in their own disciplines, the legal and medical communities are increasingly overt in their distinctions between success in the classroom and in their respective fields (Lievens et al., 2009; McGaghie, 1990; Schultz & Zedeck, 2008). We contend that, like our law and medical educator counterparts, it is time that we explicitly acknowledge that our *entrance* criteria are not strongly related to our *excellence* criteria. Of course, if we select students based solely on their likelihood for academic success, then it is hardly surprising that there may well be a disconnect in the ability of those students to meet other expectations at the conclusion of their studies. Standardized instruments like the MSAT and personality measures can be useful only if business schools, and the constituents they serve, are clear on what characteristics are most important for the next generation of managers.

Limitations

The limitations of our study stem primarily from the sample size for which we could collect data on all variables. Because we could only measure most of our individual difference variables for our student sample, generalization of those findings to a broader population of managers remains tenuous. In addition, our choice of individual measures was based on what we know to be commonly used instruments by management scholars and professionals. However, it could be that other measures of personality (e.g., Hogan et al., 1992; Costa, & McCrae, 1992) as well as emotional intelligence (Brackett & Mayer, 2003; Mayer, Caruso, & Salovey, 1999) or some triangulation or clusters of different measures (cf. Côté & Miners, 2006) would enhance the variance explained in AMK and expand the generalizability of these data.

Implications for Research and Practice

Given the size and unique nature of the database in this study, we believe the present findings are provocative and prompt further research regarding the nature and malleability of AMK. Below we highlight four directions for new investigations and educational practice: focus on fundamentals, introduce counterintuitive pedagogy, encourage perspective taking, and increase knowledge accessibility.

Focus on Fundamentals

The Russian author Tolstoy once insightfully noted that "All happy families resemble each other, but each unhappy family is unhappy in its own *way*." Similarly, we would contend that all effective managers resemble one another, but poor ones are ineffective in their own unique ways. If effective managers consistently make use of the same basic templates for acting, then AMK can certainly be taught, even to novices with no managerial experience. An impressive program of research by Goldenberg, Mazursky, and Solomon (1999) has shown that rather than focus on the abstraction of teaching "creativity," education focused more explicitly on designing creative ads—contrasted with less effective ads—has been very successful. We believe this approach, perhaps using a fundamental set of AMK templates such as that embodied in the MSAT (see Appendix), has great promise to improve the state of management practice.

This notion also supports a prescription to strive less for mastery and rather focus on achieving fundamental applied knowledge that can help aspiring managers operate in the most core and recurring situations commonly faced. Knowledge acquisition in other domains such as language acquisition, the martial arts, and social dances is established the same way. That is, the first phase of competence is how readily and skillfully novices can respond to routine situations, not simply their ability to handle unusual ones. That is, helping students of management recognize how to address the most common situations, and repeatedly coming back to those same core situations may well be a more functional approach than the comprehensive and multiple-competency learning strategies so common in our classrooms today.

To use a martial arts analogy, if a black belt designation represents expert proficiency in all of the roles and responsibilities encountered by managers at the highest levels of the organization, we would submit that high MSAT scores are akin to being a "yellow belt." That is, proficiency on the MSAT represents a clear demonstration of mastery of the fundamental building blocks and the core of effective management, but certainly is not conclusive demonstration of expert

proficiency in all management areas. Part of basic training in most disciplines also includes an emphasis on what *not* to do—or common mistakes that trained professionals always avoid. In medical training this involves things like, "no treatment without diagnosis," and "first do no harm." To the extent that we can isolate management analogues (e.g., no negative feedback in public; do not reward poor performance) we could seek to create antibodies against those behaviors in management learners. Our analysis of the variance across AMK dimensions suggests that we might have a substantive impact on scores, and ultimately practice, if we could simply inoculate our managers from being easily seduced into the most damaging, toxic, and culture-killing actions.

Introduce Counterintuitive Pedagogy

An impressive synthesis of 5 decades of research on how people learn (Donovan, Bransford, & Pellegrino, 1999) suggests that there is ample reason to believe that we *can* build contextualized knowledge, but probably not in the traditional ways we have organized our material and classrooms. We may even need to structure instruction in ways that are *counterintuitive* to both teacher and learner—counterintuitive in that instructional changes suggested by research may fly in the face of our traditional educational practice and intuition.

Examples of such counterintuitive prescriptions are found in training motor skills where it has been known for some time that *random* practice is superior to *blocked* practice (Kerr & Booth, 1978; Shea & Morgan, 1979). Yet, if learners are asked their perception as to which method is better for their own learning, they believe it to be blocked practice—a perception that is contrary to their own measured performance (Simon & Bjork, 2001). This erroneous perception may be shaped by tradition and our past educational experiences since blocked practice is how schooling is usually structured. Curricula are typically structured in a sequenced (blocked) fashion where students learn topic A, then move to topic B, and so on. Business schools may be especially inclined to favor structured and rationally blocked learning designs. However, when learners then have to deal with all topics simultaneously, "in the moment and in real situations" they falter unless they have had some random practice.

Another example of potentially counterintuitive approaches to instruction consists of beginning our lessons by first having students generate their own thoughts, perhaps incorrect, about phenomena versus simply presenting effective models and correct answers. One of the more intriguing anecdotal observations we have made in using the MSAT is how much better candidates *think* they will do than they *actually* do. In fact, even in debrief sessions immediately following MSAT administration, students frequently estimated their score far higher than their actual scores. Some prominent researchers have dubbed this phenomenon "unskilled and unaware" (Kruger & Dunning, 1999), and we believe it is likely operative in this domain.

So, one advantage of a "generate first" approach is that it provides an opportunity for students to contrast their own thinking with that of others, including experts in an area. This sets the stage for appreciating the critical features of the new information that is presented to them and their divergence from the views of experts or known templates. In the context of our study, a manifestation of that prescription might be to *start* with an MSATlike assessment and use the

results as a stimulus and direction for learning—rather than as a final assessment of managerial knowledge or effectiveness.

Encourage Perspective Taking

One of the characteristics of much traditional management education is a decidedly inner focus where the emphasis is on what the manager feels and does without commensurate attention on the perspectives of followers. A number of current authors have suggested that perspective taking and other forms of emotional intelligence underlie managerial competence (e.g., Wolff, Pescosolido, & Druskat, 2002). To manage effectively and build healthy and high-performing cultures requires a capacity to take the perspective of others—and to do so in the moment. The present findings suggest that there are curious shortcomings and disconnects in this regard. For example, while surveys indicate that employees most value managers who provide regular feedback and coaching, those areas are among the most lacking in MSAT scores.

Similarly, while followers are quick to point out that they despise "free riders" and lack of accountability in the workplace, scores on the MSAT items in those areas are among the lowest in the set. The ability to take a perspective different from your own and empathize with others becomes even more important as our workplaces become more diverse and heterogeneous in nature. However, despite its increasing relevance, there have been few studies of perspective taking in a managerial context. Perhaps of most importance to management educators and trainers are the malleable antecedents of perspective taking. Limited extant research suggests that some antecedents are likely personal (e.g., personality, experience) but others are job-related (e.g., amount of interaction with targets, occasionally doing the work of targets, etc; Bartunek, Gordon, & Weathersby, 1983; Parker & Axtell, 2001). More research devoted to the assessment and development of perspective taking and other forms of ability-based emotional intelligence would be timely and well-directed (Lindebaum, 2009).

Increase Knowledge Accessibility

To return to our earlier distinction between procedural knowledge and AMK, one of the limitations of existing curricula is their concentration on knowing *that and how*, whereas the real issue in managerial performance is knowing *to*. *Knowing to* means having access to one's knowledge in the moment—knowing to do something when it is needed. Given the right cues from instructors or course materials, students can certainly be prompted to attend to their conceptual knowledge, but it is their ability to readily access this knowledge in context that enables them to "know to" and, therefore, act. Effective instruction, then, requires solid understanding of whether poor managerial performance stems from lack of knowledge, per se, or just the inaccessibility of that knowledge. Particular importance should be placed on the contextual, uncued nature of knowledge demonstration and the explicit understanding of when and why an action is appropriate.

This is akin to distinctions between physical and psychological fidelity—many of our training contexts have sufficient physical fidelity but lack the feel and competing pressures that characterize psychological fidelity (Hays & Singer, 1989). We suspect that the breakdown in uncued performance stems in large part from managerial learners not having seen the situation

enough to recognize and know what it really feels like in context and amidst competing demands. Although few scholars have yet addressed this issue in a management context, extant evidence suggests that greater knowledge accessibility may lead to far superior educational outcomes than more knowledge alone. For example, Thompson and her colleagues (Thompson, Gentner, & Loewenstein, 2000) have shown the powerful advantages of using analogic learning techniques over traditional lectures in improving negotiator performance in simulated contexts. We see further testing of the relationship between analogic learning and managerial performance as fertile ground for future investigation and educational experimentation.

CONCLUDING NOTE

A recent advance in contemporary educational research is value-added analysis. It uses standardized test scores to look at how much the academic performance of students in a given teacher's classroom changes between the beginning and the endof the year. Accumulating evidence suggests that students of a very bad teacher will learn, on average, half a year's worth of material in one school year. The students in the class of a very good teacher will learn a year and a half's worth of material—and the cost to the school district of those two teachers is (usually) roughly the same (Rivkin, Hanushek, & Kain, 2005). Moreover, while the United States currently falls behind many developed nations in student test performance, researchers have estimated that the gap could be closed simply by replacing the bottom 6–10% of teachers with others of just average quality (Rivkin et al., 2005).

We believe that this same type of value-added approach and mind-set is long overdue in management education—and the urgency is great. As Mintzberg (1975) aptly noted many years ago, "No job is more vital to our society than that of the manager. The manager determines whether our social institutions will serve us well or whether they will squander our talents and resources." Given the low scores on our AMK measure across thousands of managers over 20 years, imagine the productivity lost and the number of people who have spent time working for an incompetent manager. What truly is the cost of a bad manager? More important, what is the value of competent ones and how much could we improve organizational performance and healthy workplaces if we just modestly increased their stock? We now have a very stark portrait of the lack of AMK in our current and future managerial population and, as a field, urgently need more empirical evidence about how to construct learning environments that foster it.

APPENDIX

Managerial Skills Assessment Test (MSAT) Information

Development and Validity of the MSAT

The GMIB and MSAT are commercially available tests published by Management and Personnel Systems, Inc. The GMIB was developed in 1983 but not offered for commercial usage until research on the test was completed in 1987. An abbreviated form of the test (GMIB Short Form) was made commercially available in the early 1990s. The GMIB Short Form test introductory section was modified slightly in 2007 to tailor it for students, and this version was named the MSAT.

In nine additional studies reported by Joines (2007), the median estimated true validity coefficient between total GMIB score and an overall composite measure consisting of ratings on a variety of management competencies (e.g., leadership, interpersonal relations, decision making, communications) was .40 (*p*s < .05 or better). Comparable analyses across the GMIB validity studies, using just the eight items from the GMIB that comprise the MSAT, revealed an estimated true validity coefficient of .36.

The Fundamental Management Situations in the MSAT

The MSAT is an 8-item short form of the larger 15-item GMIB. Note that, unlike standard in-basket assessments, test-takers are asked not just to take action on each item faced but to also describe the issues inherent in the situation and the actions they think would be appropriate—and then take the action (e.g., write a memo; provide coaching feedback, etc.). This allows for fuller assessment of their knowledge of when and why to act and a gauge of their true understanding of management principles and the generalization of those principles to different situations. Moreover, in the MSAT there are never any options proposed or cues for what actions to take—a critically important characteristic that authentically mirrors management life and dramatically changes the level of performance observed. The eight items in the MSAT depict the commonly occurring managerial situations described below.

Situation #1: How and when to involve others in decisions. The manager has to decide whether to review newly proposed guidelines and make a decision on his own, or whether to delay the implementation in favor of allowing input by team members. The team member who developed the guidelines claims urgency of implementation is critical. The manager must make a decision on how to proceed.

Situation #2: Evaluating and managing new ideas proposed by subordinates. The manager is provided information on a new idea by a subordinate manager and asked for approval to proceed with implementation. The idea will impact the way others in the division perform certain job functions. The subordinate is very excited about his proposal and wants to begin by briefing other staff on the changes. The manager must determine whether he agrees with his subordinate's plan of action.

Situation #3: Dealing with a poor performing employee. The manager has a subordinate manager who reports he has a key team member who is not performing up to par. The subordinate manager believes he has solved the problem and informs the manager of the actions he has taken. The manager must determine whether the problem is being appropriately addressed.

Situation #4: Delegating responsibility and holding others accountable. A subordinate manager reports a failed attempt to acquire information from someone at his level in a different division. The subordinate manager asks for the manager's assistance in resolving the matter. The manager must decide how this matter should best be handled.

Situation #5: Making group meetings effective. A subordinate manager has put together a plan for a meeting of many members of the division to accomplish an important objective. The

subordinate makes it clear that no one is happy about the meeting, but it has been planned and will take place in the near future. The manager must decide whether any actions should be taken with regard to the planned meeting.

Situation #6: Coaching for better team interactions and performance. The leader of an important project committee does not believe his role as chairperson is being respected and he asks the manager to intervene to clarify his authority. The manager has to decide whether more authority is the best solution or whether a different strategy would be more appropriate.

Situation #7: Dealing with people external to the organization. The manager receives a letter from an important contact with an external agency that has the power to take actions that will be costly to the manager's company. The external contact claims that one of the manager's subordinates has been unresponsive. The manager has to decide how to deal with his subordinate and how to respond to the external agency.

Situation #8: Managing conflict that jeopardizes important organizational outcomes. Two team members devise a new set of operational procedures for an important task. Neither is happy with the final solution, a compromise that maintains the main features favored by each team member. The manager must decide whether to accept the compromise solution or adopt a different strategy.

An MSAT-Type Example

To help illustrate the fundamental nature of the eight managerial situations and the applied managerial knowledge (AMK) required in each, an example is presented below. This example is not one of the actual MSAT items, but is a close enough facsimile to convey the nature of the MSAT in-basket items. Also, to protect the security of the MSAT, the sample item below uses a sales organization scenario, whereas the actual MSAT uses a neutral organizational scenario that is realistic and applicable for all management jobs, regardless of organization type or job level.

The opening section of the assessment materials provides background information of the following nature. You are the district sales manager in a midsized manufacturing firm and have four sales representatives who report to you. Your name is Pat Johnson (gender neutral name) and the four sales representatives who report to you are Tom Lillis, Eric Marr, Bob Brown, and Juanita Cortez.

Prior to leaving on a week-long business trip that will make you largely unavailable, you receive the following e-mail from one of your sales representatives.

E-Mail Correspondence

To: Pat Johnson

From: Tom Lillis, Midwest Sales Representative

Subject: New Expense Reporting Guidelines

I just wanted to let you know that I have finished the new expense reporting and sales forecasting guidelines that you asked me to develop two months ago and I'm confident that they are

excellent. First, let me apologize for being two weeks late in getting this done—it just turned out to be a bigger job than expected. Unfortunately, this puts us behind the schedule we originally discussed, and Eric Marr and Juanita Cortez have been rather persistent in letting me know these guidelines are needed. Bob Brown hasn't said anything, so he's no problem.

It seems that whenever we're under pressure to implement something new, it always takes longer than expected. I think that may be due to "too many cooks in the kitchen," if you know what I mean. And that's the case that's developing right now over these guidelines—both Eric and Juanita suggested that since they will be using the guidelines they should have a say in the final guidelines (even though they have no experience in developing these kinds of guidelines since I was the one to perform this difficult task!). My guess is that Bob Brown recognizes that he should trust me, so that's no doubt the reason he hasn't raised the issue.

Since you're going to be out the remainder of the week, I was thinking that you could trust me on this one, and simply distribute the guidelines "as is" for implementation at our staff meeting next Monday. That way, we can avoid the time delays that would no doubt take place if the other three sales reps start reviewing the guidelines with their usual intent to "find something wrong." Certainly, we need these guidelines and there should be no reason to delay implementation—that will only hurt our overall efficiency. You know, it's just a matter of teamwork— and if that point were made to Eric and Juanita, I think that would help going forward.

Thanks in advance for your trust and cooperation.

Tom Lillis

Sample Candidate Response (Common for This Type of Item)

To give a flavor for the form and nature of candidate responses, below is an example of the type of responses typical of the MSAT.

Issues: Tom Lillis has developed a new set of guidelines that will improve everyone's efficiency, and he believes the company's efficiency may be damaged if delays are caused due to nitpicking of the guidelines by the other sales reps. The other sales reps had nothing to do with this assignment, and Tom Lillis simply wants his manager to make a decision that shows he trusts him.

Actions: Advise Tom that I agree with his desire to improve efficiency, but I will need a day or two to review the guidelines. Explain that I do trust him, but as the manager, the ultimate responsibility rests with me. Let him know that if I agree with him on the quality of the guidelines, I will issue them for implementation so that we can avoid the likely delays that he worries about if the other sales representatives get involved. In the future, I will keep an eye open for any of the excessive fault finding that Tom has mentioned, since this could hurt team morale.

E-mail to Tom Lillis:

Dear Tom:

Please understand that I appreciate your efforts and I understand that these kinds of projects can take a little longer to complete than we might expect at the outset. That said, we are behind schedule as you have pointed out. Please forward me the guidelines immediately. I will review them and if I believe they are adequate, I will announce to the other sales representatives at our staff meeting next Monday that I have approved the guidelines and they will be required to immediately implement them.

Thanks for your hard work—and be aware that just because I need to review the guidelines first, it doesn't mean that I don't trust you. It's simply my overall responsibility to make such decisions and that is why we will proceed as I have indicated.

Sincerely,

Pat Johnson

AMK Scoring Protocol

While AMK is always scored using five defined scale points (0-4), our example here will, for the sake of brevity, provide guidance on the key scale points only.

AMK Rating	**AMK Scoring Guidance**
0 (No AMK):	Failure to recognize any of the embedded management principles or concepts and/ or actions that will damage the team or organization. Most common example: Fails to see need for input.
1 (Partial AMK)	Response has some significant portion of the "2" rating scale point.
2 (Minimally satisfactory)	Gets input. Takes actions to allow all sales representatives to review and comment on the guidelines before implementation. The focus of candidates at this level is typically on the quality of the guidelines and improvements that may be attained by allowing input. Candidates at this level do not demonstrate awareness of the importance of "process" such as described at the 4-point rating level.
3 (Partial of 4 rating)	Response has some significant portion of the "4" rating scale point.
4 (Excellent AMK)	Gets input and understands why input is important—that it is important for (1) the quality the product, (2) that the process used impacts team morale, motivation, and team cohesiveness (i.e., buy-in leads to support and reduces the probability of resistance). Also understands the need to coach Tom Lillis on these issues as he is

	demonstrating resistance to sharing his work, and displaying attitudes that are detrimental to effective teamwork.

Scoring of Sample Candidate Response

The candidate did not seek the input of the other sales representatives. Instead, he has concluded that the only review that matters is his own. Score = 0.

Underlying Management Principles That Determine Scoring Protocol

Conventional managerial wisdom, manifest in leading textbooks on organizational behavior (e.g., Colquitt, Wesson, & LePine, 2008) and *Management Skill Development* (e.g., Baldwin et al., 2008), is unambiguous about the issues and most effective actions in the sample item above. Put simply, managers in this situation would want to deflect the request to approve the procedures, not rely solely on their own review, and absolutely invite the input of the other sales people—for at least two reasons. First, the experience and perspective of those other three may well provide valuable input that could improve or refine the new procedures in substantive ways. Second, and probably more important, since those three people are central parties in the implementation of those procedures, their involvement will be critical to their ultimate ownership and "buyin." Getting input in this case need not cause much delay in the process, and a well-known management prescription is that dictating the procedures could elicit *compliance* while only involvement and buy-in will produce *commitment* (Vroom & Yetton, 1973).

Even allowing for the accepted maxim that there is "no one best way" to manage people, our experience is that, given the specific conditions of this scenario, management authors, teachers and advisers all readily concur that it would be dysfunctional to acquiesce to Tom Lillis and fail to invite the input of the other sales reps. Moreover, the conventional prescription for a highly effective manager in that scenario would be to think beyond just this singular event and aim to positively coach Tom Lillis, who is suggesting a bypass of involvement and participation. Such coaching would involve a sincere acknowledgment and thank-you for the initiative taken as well as appreciation for the quality of the work done. However, it would also involve an explanation of where and when participation is important in decisions and how failure to get input in situations such as this could derail implementation and lead to a low-commitment, toxic culture.

Tips for Developing In-Basket Items to Measure AMK

AMK scenarios are developed much the same way that good multiple-choice test items are constructed. First, an item needs to have a focus based on an underlying element of desired AMK. What is it that you want to evaluate? In AMK terms, this means you have to be aware of specific management principles or concepts that are likely to differentiate poor managers from highly successful ones. In the above sample item, the goal of the item is to determine whether candidates understand the need to allow input in appropriate situations. Input in the sample management situation is consistent with participatory management, and a failure to allow input is consistent with autocratic management. Moreover, the ultimate success of the guidelines may

hinge on the attitudes of those who must implement and use them, that is, the buy-in of the users is important to their support and acceptance, as opposed to their potential resistance (see Vroom & Yetton, 1973). So, the focus of the item is to provide an evaluation of the candidate's leadership style and understanding of decision making.

Second, just as a good multiple-choice test has good distractors, a well-designed AMK scenario builds in at least one feature that is designed to serve as distractor information. In the sample item, the distractor information consists primarily of the appeal for "efficiency." Such appeals are typically effective when dealing with test-takers who fail to understand participative management, and who demonstrate autocratic management styles. A secondary distractor is the manipulative appeal for the manager's trust and confidence. Some candidates will decide to support the subordinate on these grounds alone—by doing as requested. So, just as one or more management principles or concepts must be embedded in the scenario, so must at least one or more potential distractors.

Finally, in constructing AMK scenarios one should not make the assumption that extreme distractors will be quickly recognized and avoided by candidates. In the sample item, the appeals are not extreme—many MSAT items offer more exaggerated and seemingly outrageous requests for completely inappropriate management action—but which is often (maybe even alarmingly) taken by candidates. In designing and employing various AMK items with management candidates, our experience has been that there are many cases in which distractor information considered very extreme and obvious to an AMK item developer, will still not be recognized by a significant number of candidates. An interesting research stream would be to determine just how extreme distractor information must be before a majority of candidates recognize it as inappropriate.

Additional MSAT Information

The GMIB and MSAT are the only two in-basket tests, of which we are aware, for which national databases and norms have been established (Conoley & Impara, 1995). Systematic use of the same items over a 20-year period facilitates comparing an individual's score to a wide range of actual managers of varying levels of experience. At present, approximately 24,000 candidates across the United States, Canada, and Europe have completed the eight MSAT items. Candidate scores are fed back in terms of the candidate's relative percentile standing within the database, just as results are reported for college entrance exams. Comparisons may be made to all subjects in the database, or to managers at specific levels in the organizational hierarchy (e.g., candidates may be compared only to managers applying for entry management jobs, or senior management jobs, etc.).

The GMIB and MSAT provide no multiple-choice options and are true managerial simulations that require narrative responses—including memos, letters, e-mail, etc.). We are not aware of other simulations that marry open-ended responses, with no cues, with a systematic scoring protocol that enables such high levels of objectivity and interrater reliability.

Responses are scored by trained evaluators using the previously described fixed standard rating scales. The detailed and fully documented scoring protocols have consistently produced high

interrater reliability. Item scoring and total test interrater reliability research has established that the test is within the realm of what is considered objective scoring. In 42 studies of the scoring system for the full 15-item GMIB test, the mean total score interrater reliability was .92 (Joines, 2007). Based on the generalized Spearman-Brown formula for estimating reliability based on altering the length of a test (Guilford, 1954), the estimated total score interrater reliability of the abbreviated 8-item MSAT is .86.

The MSAT includes a bonus point for planning and organization. This point is awarded to candidates who plan and organize their time to fully complete a critical item regardless of the quality of their work. This approach improves the overall predictive validity of the test, particularly with respect to the prediction of on-the-job ratings of planning and organizing. Thus, for this one item, actual scores for those who fully complete the item range from 1 to 5, but the underlying 0–4 rating scale is structured exactly the same as for all other items. However, when a pure AMK assessment is conducted, the bonus point is excluded from the analysis, since this point is not a function of AMK.

The parent test of the MSAT, the GMIB, has been proven to be significantly predictive of success in management. The initial validation of the GMIB was a large-scale study of 365 managers drawn from 120 occupational groups, and included subjects at all organizational levels. Reviewers in the *12th Mental Measurements Yearbook* found the GMIB to be psychometrically sound and to have predictive validity comparable to full-scale assessment centers (Conoley & Impara, 1995). In this study, two overall composite performance measures based on six management skill performance ratings yielded estimated true validity coefficients of .41 and .44 in predicting ratings by immediate and next higher level supervisors. The range of estimated true validity coefficients in predicting job performance ratings on the six management skills (leadership, interpersonal relations, planning and organizing, analyzing problems/making sound decisions, written communications, and oral communications) ranged from .26 to .56 with all coefficients attaining significance at the $p < .05$ level or higher.

Joines (2007) reports nine additional validity studies. Six of these studies included ratings by immediate supervisors on the six performance dimensions included in the original study, and five of these studies also included ratings by next higher level supervisors. The median estimated true validity coefficient across these studies was .40, with 10 of the 11 validity coefficients significant at the $p < .05$ or higher level. In two small-scale studies with sample sizes of 6 and 15, validity coefficients were based on correlating total test score with the results of ranking subjects based on their overall performance. The obtained coefficients were .80 and .67, respectively. Finally, in a study of 393 civilian managers at three levels in the organizational hierarchy conducted by the Department of Army (Mack & Lilienthal, 1991), ratings on specific management skills were not utilized in favor of heterogeneous criterion measures (e.g., quality of supervisory performance, quantity of workgroup output, etc.). Nevertheless, the GMIB was found to be valid at all levels (mean validity = .25). Also important, the authors concluded that “There were no differences in the magnitude of validity for Blacks versus Whites or males versus females.” The authors proceeded to conduct an evaluation of test fairness and concluded that the test was fair for all groups.

The correlation of total scores on the eight items that comprise the MSAT with total scores based on the 15 items that form the GMIB (MSAT items are a subset) was found to be .84 (*N* = 19,496). The validity of a test altered in length by a specified proportion may be estimated based on the original test's validity and reliability (Guilford, 1954: 407). When the GMIB is reduced from 15 to eight items, and GMIB validity = .40 and mean interrater reliability = .92, the validity of the MSAT is found to be .39. Alternately, reliability of the GMIB may be viewed in terms of the internal consistency of the 15 GMIB items; and Cronbach's coefficient alpha for the GMIB = .71 (Joines, 2007). This method yields MSAT validity = .36.

The validity of the MSAT is also supported by research in the original GMIB validation study in which item validities were investigated. These results indicated that seven of the eight MSAT items produced significant validity coefficients with one or more measures of overall performance, with one item falling short of significance while demonstrating a pattern of positive criterion correlations with significance at the .05 or .10 level for ratings on three of the six management skills.

Unlike most assessment center processes, including traditional in-baskets, the GMIB and MSAT are not prey to the argument so frequently made by critics of assessment centers that they do not possess construct validity (Klimoski & Brickner, 1987; Sackett & Dreher, 1982; Sackett & Harris, 1988). Based on a principal components factor analysis, factor scores on the GMIB (and MSAT) are generated by combining item scores that are weighted according to the results of the factor analysis (Conoley & Impara, 1995; Joines, 1991; Joines, 2007). Thus, GMIB and MSAT factor scores (or dimensions) are not determined through the subjective judgment of raters. Therefore, the question of the ability of raters to assign dimension ratings that demonstrate satisfactory construct validity does not arise. GMIB and MSAT raters merely rate the separate items using detailed scoring schemas, with factor (dimension) scores determined by mechanically combining the item scores using the item weighting protocols that were derived through examination of item-factor loadings in the factor analysis study.

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