In the June 1992 issue of *Current Directions* (pp. 86–89), Malcolm James Ree and James A. Earles argued that "intelligence is the best predictor of job performance":

If an employer were to use only intelligence tests and select the highest scoring applicant for each job, training results would be predicted well regardless of the job, and overall performance from the employees selected would be maximized. (p. 88)

In their article, Ree and Earles summarized a vast research literature on the efficacy of $g$, or general intelligence, in predicting job performance, both in training phases and in application of job knowledge and skills to actual job performance. In every case cited, $g$ correlated from .33 in range-restricted samples to .76 in more general population samples of job applicants. Non-$g$ aptitudes added little to the prediction from $g$.

Critics of the connection between general intelligence and job performance voice their objections and counterpoints in an article and several comments that follow.

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**Controversy**

**The $g$-ocentric View of Intelligence and Job Performance Is Wrong**

Robert J. Sternberg and Richard K. Wagner

The geocentric view of the universe holds that the earth is at the center of the universe. The earth, therefore, is the most important entity in the universe. Indeed, one only has to look up in the sky to watch the sun revolve around the earth. The "$g$-ocentric" view of intelligence holds that a "general ability" is at the center of the person. This general ability, therefore, is the most important ability in a person, and all other abilities revolve around it.

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THE $g$-OCENTRIC VIEW OF INTELLIGENCE AND JOB PERFORMANCE

One of the things that is predicted by $g$, according to $g$-ocentric theorists, is job performance. In this view, if an employer were to use only intelligence tests to select the highest scoring applicant for each job, training results would be predicted well regardless of the job, and overall performance from the employees selected would be maximized.

Malcolm Ree and James Earles are not alone in their glorification of conventional intelligence tests as the magic bullet for maximizing prediction of job performance. Other investigators, most notably, Frank Schmidt and John Hunter, have taken similar, although not necessarily quite so extreme, positions. None of these investigators believe that $g$ is all-important. They do, however, value $g$ very highly—perhaps more highly than it deserves.

Conventional intelligence tests were originally designed by Alfred Binet and Theodosius Simon to predict performance in school, and they provide fairly creditable, although certainly incomplete, prediction of such performance, as well as of performance in job training. But their prediction of performance on the job is weaker, and their prediction of roughly 5% to 10% of the variance in job performance leaves plenty of room for other kinds of predictors, including intellectual ones that go...
beyond conventional, narrow theories and tests of intelligence to modern, broader theories and tests.\textsuperscript{4}

In this article, we describe a research program that, we believe, contributes to the refutation of the g-centric view of intelligence and job performance. We present an alternative view in which intelligence is neither wholly domain-general, the point of view taken by g-centric theorists, nor largely domain-specific, the point of view taken by many modern cognitive theorists.\textsuperscript{5} Instead, intelligence is domain-centered, meaning that certain principles of organization apply across domains, which then manifest themselves differently within different domains. Examples of such domains are management, sales, college teaching, and college student life, as shown below.

We wish to make clear at the outset what our main claim is. We assert that tests of practical intelligence, of the kind we will describe, provide a meaningful and useful complement to the tests of academic intelligence and other attributes that are currently used for job selection and placement. Neither our tests nor any others provide a panacea. But our tests provide important information that goes beyond what is being measured by conventional tests of abilities.

\section*{The Distinction Between Academic and Practical Intelligence}

Why is prediction of job performance by intelligence tests modest, or at least more modest than is prediction of academic performance? We believe, along with Ulric Neisser and others, that there are two important reasons. First, academic and practical problems have different characteristics. Second, academic and practical intelligence have different characteristics.

Academic problems tend to (a) be formulated by other people, (b) be well-defined, (c) be complete with regard to the information needed to solve them, (d) possess only a single correct answer, (e) possess only a single method of obtaining the correct answer, (f) be disembedded from ordinary experience, and (g) be of little or no intrinsic interest.

Practical problems, in contrast, tend to (a) require problem recognition and formulation, (b) be ill-defined, (c) require information seeking, (d) possess multiple acceptable solutions, (e) allow multiple paths to solution, (f) be embedded in and require prior everyday experience, and (g) require motivation and personal involvement.

Thus, practical problems have characteristics that to a large extent are the opposite of the characteristics of the academic problems found in schools and on conventional intelligence tests. As a result, tests of academic problem-solving ability result in lesser prediction of practical job-related performance than of academic or even job-learning performance.

We also believe that academic and practical intelligence are rather different in kind. In academic intelligence, the relevant knowledge is of content and rules, and is formal and out in the open. It is learned primarily by reading and listening, and it is highly valued in the schools. It is measured by conventional ability tests. People at the top of the scale are called "intelligent" or, if knowledge is more of a factor, "expert," whereas those at the bottom are called "stupid" or "ignorant."

In practical intelligence, in contrast, the relevant knowledge is of norms, and the knowledge is informal and often tacit. It is knowledge about, rather than of, a discipline. It is learned primarily by observation and modeling, and it is devalued in most schools. It is probably best measured by simulations. People at the top of the scale are called "shrewd," or if they put their intelligence to the good of other people as well as of themselves, "wise," whereas those at the bottom are called "naive" or even "foolish."

\section*{The Construct of Tacit Knowledge}

We believe that the key to practical intelligence is what Michael Polanyi has called tacit knowledge, the practical know-how one needs for success on the job. Often it is not openly expressed or stated, and it usually is not taught directly. Tacit knowledge can refer to management of oneself, other people, or tasks. Furthermore, it can be either local and short-term or global and long-term. In the context of the triarchic theory of intelligence,\textsuperscript{6} tacit knowledge is the product of "knowledge-acquisition components" and is applied toward adapting to job and other contexts.

We measure tacit knowledge through scenarios that describe work-related situations requiring problem solving and decision making. Subjects are presented with a set of roughly 12 scenarios, each followed by options for dealing with the situation presented. Typically, the subjects rate each of between a half-dozen and a dozen options on a scale from 1 (poor solution) to 7 (excellent solution). Examples of test items measuring tacit knowledge in four domains—management, sales, academic psychology, and being a college student—are shown in the appendix.

We have used three different scoring methods. The first is an expert—novice difference method. The average ratings of experts and novices on each option are compared, and the item is then scored in the direction favoring the experts. Thus, if experts rate the option higher than novices, higher ratings are scored as better, whereas if novices rate the option higher, lower ratings are scored as better. The sec-
These low correlations have held up both within the range of intelligence of people who normally go into the occupation (e.g., the range of intelligence of managers) and within broader ranges (e.g., the range of intelligence of military recruits taking the test for managers). Of course, with a broad enough range (e.g., one that includes a sample of profoundly retarded subjects), tacit knowledge will very likely show a correlation with IQ, but so will practically any other behavioral measure.

3. Tacit knowledge is not a proxy for measures of personality, cognitive style, or interpersonal orientation, either. When tests of these attributes were given to managers, and hierarchical regression was used to predict performance on managerial simulations, tacit knowledge of management was the best single predictor of simulation performance, and its contribution was still statistically significant after holding all other variables constant. In a study at the Center for Creative Leadership, the incremental contribution (ΔR²) of adding IQ to tacit knowledge in predicting performance on a managerial simulation was .09, whereas the incremental contribution of adding tacit knowledge to IQ was .32.

4. Although tacit-knowledge measures do not correlate with measures of other potentially confounding constructs, subscores within a domain (e.g., tacit knowledge of self, others, tasks) do correlate moderately with each other (about .3), suggesting that there may be a general factor underlying tacit knowledge within a domain that is different from the general factor measured by psychometric intelligence tests.

5. Tacit-knowledge measures also correlate across domains (at about the .5 to .6 level), suggesting that there is at least some commonality of the tacit knowledge required for success in different domains of work.

6. Tacit knowledge predicts job performance moderately well, correlating about .3 to .5 with measures such as rated prestige of business or institution, salary, performance appraisal ratings, number of publications, and the like. These correlations, uncorrected for attenuation or restriction of range, certainly compare well with those that have been obtained for IQ within the range of abilities we have tested. Moreover, they hold up across a variety of jobs.

7. Tacit knowledge also predicts both academic performance and adjustment in a college setting. Its prediction of the former is about as good as that of conventional academic ability tests (with a multiple R of about .6), whereas its prediction of adjustment is better (with a multiple R of about .8).

8. The tacit knowledge needed for success in any setting depends in part on the particular institution (e.g., an upstart company vs. a more mature one; a small college vs. a large university) and the level of advancement one has reached within that institution (e.g., lower level vs. upper level manager).

9. Acquisition of tacit knowledge appears to require selective encoding, whereby one decides on what aspects of the environment are relevant for one's practical purposes; selective combination, whereby one decides how to integrate disparate pieces of tacit knowledge; and selective comparison, whereby one decides how to bring tacit knowledge from past experiences to bear upon present challenges.

10. Tacit knowledge can be taught, though when it is, it ceases to be tacit. It is best taught through modeling and simulation, rather than through direct instruction.

CONCLUSION

The geocentric approach to the universe is wrong, and so is the
g-ocentric approach to abilities. We are not condemning conventional theories or tests of intelligence, but in the prediction of job performance, we do believe that they need to be supplemented by broader ability measures of the kind we have defined and described here.

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Notes


APPENDIX:
EXAMPLES OF ITEMS MEASURING TACIT KNOWLEDGE IN FOUR DOMAINS

Management

You are responsible for selecting a contractor to renovate several large buildings. You have narrowed the choice to two contractors on the basis of their bids and after further investigation, you are considering awarding the contract to the Wilson & Sons Company. Rate the importance of the following pieces of information in making your decision to award the contract to Wilson & Sons:

- The company has provided letters from satisfied former customers.
- The Better Business Bureau reports no major complaints about the company.
- Wilson & Sons has done good work for your company in the past.
- Wilson & Sons’ bid was $2000 less than the other contractor’s (approximate total cost of the renovation is $325,000).
- Former customers whom you have contacted strongly recommended Wilson & Sons for the job.

Sales

You sell a line of photocopy machines. One of your machines has relatively few features and is inexpensive, at $700, although it is not the least expensive model you carry. The $700 photocopy machine is not selling well and it is overstocked. There is a shortage of the more elaborate photocopy machines in your line, so you have been asked to do what you can to improve sales of the $700 machine.

Rate the following strategies for maximizing your sales of the slow-moving photocopy machine.

- Stress with potential customers that although this model lacks some desirable features, the low price more than makes up for it.
- Stress that there are relatively few models left at this price.
- Arrange as many demonstrations as possible of the machine.
- Stress simplicity of use, since the machine lacks confusing controls that other machines may have.
Academic Psychology

It is your second year as an assistant professor in a prestigious psychology department. This past year you published two unrelated empirical articles in established journals. You don’t, however, believe there is yet a research area that can be identified as your own. You believe yourself to be about as productive as others. The feedback about your first year of teaching has been generally good. You have yet to serve on a university committee. There is one graduate student who has chosen to work with you. You have no external source of funding, nor have you applied for any.

Your goals are to become one of the top people in your field and to get tenure in your department. The following is a list of things you are considering doing in the next two months. You obviously cannot do them all. Rate the importance of each by its priority as a means of reaching your goals.

_____ Improve the quality of your teaching.
_____ Write a grant proposal.
_____ Begin a long-term research project that may lead to a major theoretical article.
_____ Concentrate on recruiting more students.
_____ Begin several related short-term research projects, each of which may lead to an empirical article.
_____ Participate in a series of panel discussions to be shown on the local public television station.

College Student Life

You are enrolled in a large introductory lecture course. Requirements consist of 3 exams and a final. Please indicate how characteristic it would be of your behavior to spend time doing each of the following if your goal were to receive an A in the course.

_____ Attend class regularly.
_____ Attend optional weekly review sections with the teaching fellow.
_____ Read assigned text chapters thoroughly.
_____ Take comprehensive class notes.
_____ Speak with the professor after class and during office hours.

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Intelligence Is Not the Best Predictor of Job Performance

David C. McClelland

Ree and Earles¹ are wrong in implying that cognitive ability as measured by typical intelligence tests is the best predictor of job incumbency, which they consider “a measure of level of job performance.”

By job incumbency, they mean occupational status, and they repeat unthinkingly the classic assertion commonly made by testers² that superior intelligence is responsible for the fact that some people turn out to be engineers and doctors rather than police officers and meat cutters. But cognitive intelligence is by no means the best predictor of occupational status. Family advantage is, as Jencks³ has conclusively demonstrated in a review of a number of

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