

Employee selection: will intelligence and conscientiousness do the job?

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Executive Overview

Despite years of research designed to match jobs and people, selection decisions are not always based on an exact fit between the person and the job. Microsoft values intelligence over all else, for all jobs. Southwest Airlines values character. When are these general characteristics adequate to the task of selecting job candidates? Should firms value intelligence and conscientiousness above specific skills?

Ask any ten human resource managers how they select employees and you will find that most of them work from the same set of unchallenged, generally unspoken ideas. Their way of thinking and the employee selection procedures that stem from it involve precise matching of knowledge, ability, and skill profiles. They see employee selection as fitting a key—a job candidate—into a lock—the job. The perfect candidate's credentials match the job requirements in all respects. Only an exact fit guarantees top employee performance. Cook, McClelland and Spencer capture the precise matching idea in the AMA's *Handbook for Employee Recruitment and Retention*:

The final selection decision must match the 'whole person' with the 'whole job.' This requires a thorough analysis of both the person and the job; only then can an intelligent decision be made as to how well the two will fit together. . . stress should be placed on matching an applicant to a specific position.¹

A quick examination of Gatewood and Feild's *Human Resource Selection*² illustrates the importance that many human resource managers and industrial psychologists assign to precise matching. The authors devote 576 of the book's 726 text pages to discussions of measuring the characteristics of jobs and the competencies they demand, measuring job candidates' knowledge, skills and abilities, and to the problems involved in matching the two.

A small number of top managers and others now publicly question the precise matching approach. They argue that firms can identify top performers by focusing on key employee characteristics that lead to success in all or almost all jobs. Bill Gates of Microsoft belongs to this group. He is reported to have a bias toward, "intelligence or smartness over anything else, even, in many cases, experience" in judging potential employees.³ His inclination has been translated into action at Microsoft, whose recruiters seek high-IQ candidates and worry about teaching skills later.⁴ Daniel Seligman, a *Fortune* editor, takes Gates's argument a giant step further. He writes, "(1) all companies would ben-

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efit from hiring smarter people, and (2) IQ matters in all jobs, including sweeping up the place after the programmers go home."⁵

Others who depart from precise matching focus less on intelligence than on what they call employee attitude or character. Richard L. Barclay, vice president of Barclay Enterprises, Inc., a small

California firm that remanufactures telephone equipment, argues:

For the lower echelon, unskilled positions, companies don't need trained applicants nearly as much as they need people of character. I can train a person to disassemble a phone; I can't train her to not get a bad attitude when she discovers that she's expected to come to work everyday when the rest of us are there. I can train a worker to properly handle a PC board; I can't train him to show up for work sober or to respect authority.⁶

Southwest Airlines, Nucor Steel, and Silicon Graphics Inc. emphasize the importance of character in hiring for a wide range of jobs, not only for the unskilled, entry-level ones that concern Barclay. These companies share an approach to hiring based on the idea that:

*What people know is less important than who they are. Hiring, they believe, is not about finding people with the right experience. It's about finding people with the right mindset. These companies hire for attitude and train for skill.*⁷

While not everyone accepts the idea that focusing on single key employee characteristics should replace precise matching, some exciting research supports this line of thinking.

Smart People Finish First

Intelligence, the peculiarly human talent for solving problems using words or symbols, has been the source of many acrimonious debates among psychologists, who argue over its very nature. Some hold that intelligence consists of a number of more-or-less independent gifts. Thurstone, one of the pioneers of intelligence research, concluded that each human has his or her own mix of ten different intelligences: deductive, inductive, mechanical, memory, numerical, perceptual, reasoning, spatial, verbal, and vocabulary.⁸ Opponents argue that these specific intelligences are merely minor subdimensions of a single human ability that they call "general intelligence," or *g*.

The available research points strongly to the conclusion that adding measures of specific intelligences like those identified by Thurstone increases *g*'s ability to predict employees' job performance only marginally. Ree and Earles report in the case of US Air Force airmen that considering

non-*g* intelligence scores improved the average correlation coefficient by only .06.⁹

Experts on intelligence have accumulated enough research on the general intelligence-performance relationship to allow us to draw two additional conclusions.

First, *g* predicts employee performance in job training extremely well. Analyses going back to the early part of the century, when paper-and-pencil tests of intelligence originated, indicate that *g* predicts classroom performance of students from the early primary grades to the college level quite nicely. Such tests also predict how well men and women do in job training. Ree and Earles studied Air Force enlisted personnel who had participated in 89 different job training programs.¹⁰ They found that *g* correlated extremely highly (an average correlation coefficient of .76) with training performance. The relationship held for easy courses as well as for difficult ones.

Second, general intelligence does a good job of predicting job performance, though not as good as it does regarding training performance. Hunter and Hunter, for example, performed a meta-analysis of existing studies of the relationship between *g* and performance in training programs and on the job. (Meta-analysis is a procedure that researchers use to draw general conclusions from a set of existing studies using different subjects, measures, and methods.) The results led them to conclude that if "general cognitive ability alone is used as a predictor, the average validity across all jobs is .54 for a training-success criterion and .45 for a job proficiency criterion."¹¹

This does not mean that general intelligence predicts job performance poorly, however. Studies done over the last 85 years indicate that paper-and-pencil tests of *g* consistently predict job performance well. In fact, much of the early interest in paper-and-pencil measures of intelligence and other human characteristics stemmed from the US Army's success in placing World War I recruits into occupational specialties on the basis of their scores on a primitive intelligence test called army alpha. Over forty years ago, Ghiselli and Brown, concluded that the average correlation between *g* and job proficiency for managers was .37,¹² a figure Schmidt and Hunter argue actually substantially underestimates the relationship's true strength because of quirks in statistical analysis.¹³

More recent work by Schmidt and his co-workers and by Ree and Earles indicates that *g* predicts performance well in a wide range of jobs, not just those we normally think of as requiring substantial brain power. For example, Hunter and Hunter analyzed data from 515 studies that the US Employ-

ment Service conducted to find out if its measure of general intelligence predicted job performance.¹⁴ The occupations in the USES studies sampled practically the entire range of those described in the *Dictionary of Occupational Titles*, far and away the most complete listing of jobs around. Hunter and Hunter's results indicate that *g* does a good job of predicting performance for almost all of them. The average of the correlation coefficients obtained was .47, substantially higher than industrial psychologists usually obtain when they try to predict performance on the basis of other human characteristics.

Similarly, Ree and Earles report the results of studies of the relation between general intelligence and job performance in two groups of US Air Force personnel. In the case of college-graduate navigators and pilots, the correlations between *g* and ten different job performance measures averaged a gratifying .33. In the case of airmen with roughly two years experience in eight different jobs (two administrative, two electronic, two general technical, and two mechanical), the correlations between *g* and hard measures of their on-the-job performance, their ability to explain key elements of their jobs step-by-step, and ratings by their supervisors, averaged an even more impressive .44. Ree and Earles found the evidence so convincing that they concluded, "If an employer were to use only intelligence tests and select the highest scoring applicant for each job...overall performance from the employees selected would be maximized."¹⁵

Schmidt and his associates suggest that:¹⁶

- While general intelligence predicts performance well, it predicts employee job knowledge even better.
- The relation between *g* and performance holds beyond the employee's first weeks or months on the job, when critical job knowledge is learned. General intelligence was found to predict performance five years out, the longest span studied.
- The relationship between *g* and performance is stronger for supervisors than it is for non-supervisors.

On the basis of these research results, we can take a first cut at modeling how general intelli-

gence influences employees' performance. This model is based primarily on the ideas of Schmidt and Hunter, who provide a comprehensive discussion of the relationships involved.¹⁷

As shown in Figure 1, the simplest interpretation suggests a straightforward pattern in which general intelligence governs how well employees do in training, which affects their job knowledge, which in turn influences their job performance. This relationship is very strong, but additional results suggest that it is not the only way in which intelligence affects job performance.

As shown in Figure 2, certain refinements of the simple model are in order. First, Schmidt and Hunter's analysis indicates that *g* affects job performance directly, though the relationship is not as strong as the one that goes through training performance and job knowledge. Second, they conclude that the relationship is stronger for some jobs, for example, those of supervisors, than it is for others. Although this fact can be explained in a number of ways, Schmidt and Hunter suggest that the difference lies not in the job of supervisor itself, but in the fact that supervisors are required to improvise solutions to poorly defined problems, something intelligent individuals do especially well. In other words, the more problem solving a position requires, the better the job *g* does in predicting employee performance.

The "Big Five" Personality Dimensions

A second important body of research has to do with character or employee attitude, with what psychologists are likely to label personality or dispositional factors. These are patterns of behavior that persist across a wide range of situations and over much of a person's lifetime.

The never-ending list of terms invented to designate human traits—dimensions or aspects of personality—has long frustrated psychologists, who hold that a small number of major traits probably underlie all of the labels. While psychologists began to speculate about the nature and number of these underlying dimensions in the 1930s, it was not until the 1960s that a general framework based on solid research began to emerge. This framework captures the key aspects of personality in five

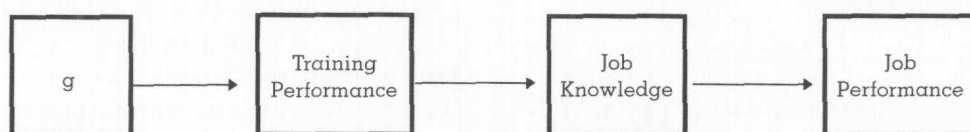


FIGURE 1

A First Cut at Modeling the Relation Between General Intelligence and Job Performance

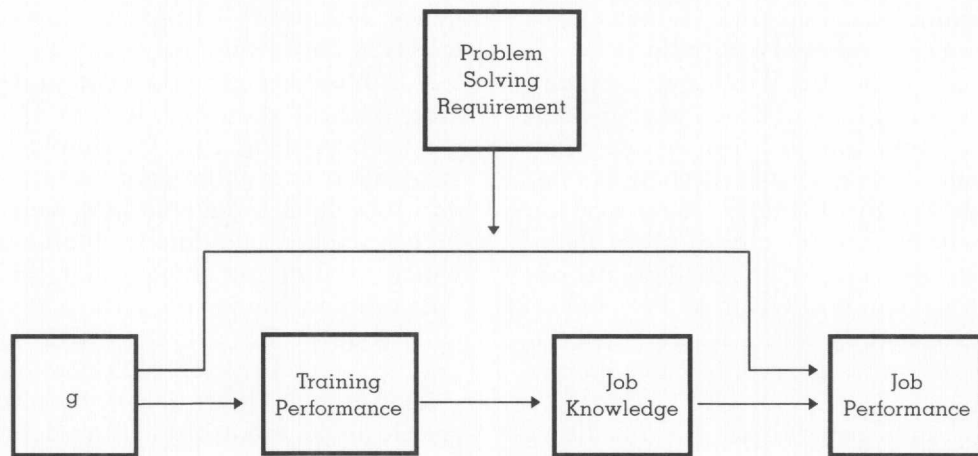


FIGURE 2

A Second Cut at Modeling the Relation Between General Intelligence and Job Performance

primary dimensions. Inevitably, these have become known as "the Big Five."¹⁸ Not every personality expert believes that the big five framework is the best one, but it is more widely accepted than any other. The Big Five are:

Extroversion

Extroversion is the degree to which a person is active, assertive, gregarious, sociable, and talkative. I used to teach management training programs for business firms and trade associations. As a strong introvert, after a long day on the platform I wanted only to go back to my hotel room, lock the door and talk to no one for the rest of the evening. My partner, an extrovert, happily headed for the bar and dinner with a half-dozen program participants in tow.

Emotional Stability

Emotional stability is the opposite of emotional instability, which is the degree to which a person is angry, anxious, depressed, emotional, insecure, and worried. Abraham Lincoln is reported to have

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said, "Most people are just about as happy as they choose to be," implying that your outlook plays a bigger role in happiness than do things that happen to you. Many psychologists agree with Lincoln,

though they probably would add that he should have said, "Most people are just about as happy as their level of emotional stability leads them to be."

Studies by University of Minnesota researchers indicate that people have an emotional "set point" to which they return.¹⁹ The researchers argue that this set point is mainly hereditary. Arvey, Bouchard, Segal, and Abraham indicate that job satisfaction is a function of personality, as well.²⁰ Their studies of identical twins raised apart indicate that as much as 30 percent of job satisfaction derives from our genes rather than our jobs.

Agreeableness

Agreeableness is the degree to which someone is cooperative, courteous, flexible, forgiving, good-natured, soft-hearted, tolerant, and trusting. Many people are easy to be around, but others are thorny, prickly, and hard to get along with. The contrast between the two was driven home to me when I was asked to evaluate two candidates for a key management position. It was not their skills that separated them; both were technically qualified to do the job. However, A was consistently described by colleagues, subordinates and superiors as "a really nice guy," while B was labeled "a pain," among other things. When pressed for concrete examples of what they meant, some people described times when A had gone out of his way to help them. Others cited his consistent concern for coworkers. B was described as tough, abrasive, and focused on getting the job done, with little thought to who might be hurt in the process. While some worried that A might be too soft for the job, my final report pointed out that his agreeableness had allowed him to develop close ties to experts

inside and outside the firm whose specialized knowledge would be valuable down the road. He would be able to enlist their help in solving the unknown but inevitable problems the new job promised.

Conscientiousness

Conscientiousness is the degree to which an individual is achievement-oriented, careful, hard-working, organized, planful, persevering, responsible, and thorough. I have supervised both high and low conscientiousness employees over the years. Many of the latter were charming individuals; they were often laid back, relaxed and hard to ruffle. One once told me, "I don't sweat the small stuff." He might have added: "even many of the things that you think are critical!" One highly conscientious subordinate was all business. He arrived at our first meeting with a typed copy of his daily schedule, a sheet bearing his home and office phone numbers and addresses and his e-mail address. At his request, we established a time table for meetings for the next four months. He showed up on time every time, day planner in hand, and carefully listed tasks and due dates. He questioned me exhaustively if he didn't understand an assignment and returned on schedule with the completed work or with a clear explanation as to why it wasn't done.

Openness to Experience

Openness to experience is the degree to which the individual is artistically sensitive, broad-minded, cultured, curious, and original. Obviously, those concerned with success on the job are more interested in the broad-minded-curious-original side of this dimension than they are in the artistically sensitive-cultured side. For those high in this aspect of openness to experience, the old dictum, "If it ain't broke, don't fix it" has little meaning. They embrace change and seek new ways of doing and thinking about things.

A discussion of the Big Five, taken alone, usually generates a "So what?" response from managers. It is only when we begin to discuss a ground-breaking piece of research by Barrick and Mount, that their ears perk up.²¹ Barrick and Mount identified 231 studies testing the relationship between various big five personality dimensions and performance. They discarded 114 of them for various technical reasons. From their analysis of the remaining 117 studies, they were able to draw conclusions about the usefulness of

the Big Five as predictors of training and of job performance. They were able to draw conclusions for five groups: professionals, police officers, managers, salespersons, and skilled/semiskilled employees in a wide range of occupations.

Barrick and Mount's critical finding is this: In every case where they had enough data to make a judgment, for each one of the five occupations conscientiousness significantly predicted performance. In fact, with the exception of training performance, where the impact of openness to experience and of extroversion were fractionally greater, conscientiousness was the best single predictor in every case in which Barrick and Mount had enough data to draw conclusions.

While Barrick and Mount included only studies performed in North America, Salgado recently performed a similar analysis focusing on studies performed in the European Community.²² Though his results differ in some respects from those of Barrick and Mount, they clearly support the idea that conscientiousness is a critical predictor of performance across a wide range of jobs.

Obviously, these works suggest further refinements of the model of performance laid out in Figure 2. As shown in Figure 3, conscientiousness affects job performance through two paths. First, it acts by improving performance in training programs, which in turn improves job knowledge, leading eventually to better job performance. Second, it affects job performance directly; conscientious individuals simply are likely to do a better job.

As also shown in Figure 3, the results of a later study by Barrick and Mount²³ indicate that the impact of conscientiousness is not the same from job to job. In this study, they examined the role that an individual's autonomy plays in determining the impact of conscientiousness on the performance ratings received by 154 managers. Conscientiousness affected the ratings for managers holding high autonomy jobs more than it did for managers in low autonomy jobs. This makes sense. If an individual is closely supervised or is carefully monitored in other ways, conscientiousness should be less critical.

Putting the Research to Work

The first response of some managers to the facts laid out in the previous paragraphs is, "It's a no-brainer! All we need to do is hire smart, conscientious people!" However, two general cautions are in order.

First, while conscientiousness and general intel-

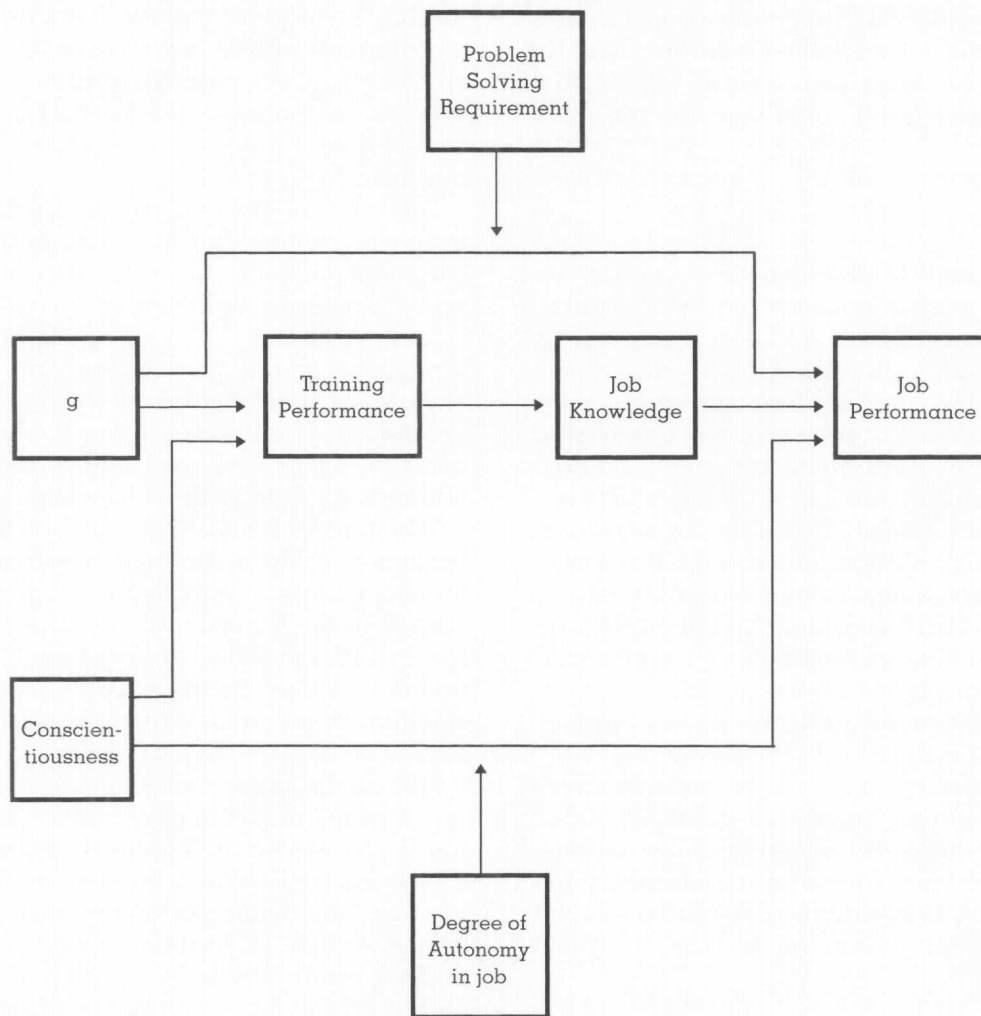


FIGURE 3

A Third Cut at Modeling the Relationships Among General Intelligence, Conscientiousness and Job Performance

Intelligence predict performance well, they do not predict it perfectly. Most of us can think of races in which a persistent tortoise outperformed a brilliant hare and of specific assignments in which agreeableness or some other trait proved more important than conscientiousness. Intelligence and conscientiousness are excellent indicators of potential, not guarantees of success. Second, the evidence

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is far from complete, but a nagging possibility exists that *g* and conscientiousness may predict job performance better for yesterday's jobs than they do for today's. The bulk of the research we have considered thus far focuses on individual job

proficiency in traditional jobs. Despite the widespread use of work teams in today's businesses, there are no studies that look at how well intelligence predicts performance in teams. Studies of the role conscientiousness plays on work team performance are few in number and yield mixed results. On the one hand, Thoms found that conscientiousness predicts employees' estimates of their own ability to perform well in teams, which has repeatedly been shown to relate to actual performance in teams.²⁴ On the other hand, Barry and Stewart found no significant relationship between conscientiousness and teammates' perceptions of the kinds of contributions individuals made to group functioning or to team performance in graduate student problem-solving teams.²⁵

The same kind of uncertainty exists about the role that conscientiousness plays in generating the often-unrewarded "beyond the call of duty" contri-

butions called organizational citizenship behaviors (OCB). Organ's 1994 review of research on the relationship led him to be hopeful, though far from confident: "For now, if we had to stake our hopes on one measurable fact of the person that explains appreciable variance in OCB, the data suggest that it would have something to do with the Big Five's Conscientiousness."²⁶ However, a later study of factors influencing supervisors' ratings of OCB in a large hospital was able to uncover only a somewhat suspect relationship between conscientiousness and one of five forms of organizational citizenship behavior.²⁷

Beyond these two caveats, however, we need to deal with a pair of additional matters that take selecting employees out of the "no brainer" category. First, there are situations where employers must as a matter of necessity use a precise matching approach rather than focus on candidates' general intelligence and conscientiousness. We need to lay out the circumstances under which this is the case. Second, we need to spell out some key ideas having to do with measuring g and conscientiousness.

Choosing Between Precise Matching and a Focus on General Intelligence and Conscientiousness

As Figure 4 indicates, there are at least five circumstances that should lead employers to consider replacing precise matching with a search for employees with a mix of g and conscientiousness. The first two suggestions rest on the results of the research discussed in the preceding pages. The remaining three have not been tested in the laboratory, but make sense logically.

- **When the Job Calls for a Great Deal of Problem Solving.** In this case, g influences the ability of individuals to identify problems and to come up with creative ways to solve them. It appears likely, as well, that conscientious men and women assign high priorities to company concerns and thus look for solutions that benefit their employers, not just themselves.
- **When the New Employee Will Have a High Degree of Autonomy.** Employees in some jobs have little opportunity to show initiative on the one hand or to goof off or goof up on the other. Some of these workers spend the bulk of their day

Rely Primarily on g and Conscientiousness When . . .	Rely Primarily on Precise Matching When . . .
<ul style="list-style-type: none"> • The new employee will be called on to do a great deal of problem solving. 	<ul style="list-style-type: none"> • The new employee will be called on to do little or no problem solving.
<ul style="list-style-type: none"> • The new employee will have a high degree of autonomy; i.e., he or she will work pretty much on her or his own. 	<ul style="list-style-type: none"> • The new employee will be closely monitored or performance problems will be otherwise obvious to his or her superior.
<ul style="list-style-type: none"> • The skills and abilities the new employee will learn on the job are more important than those he or she brings to the job. 	<ul style="list-style-type: none"> • The skills and abilities that the new employee brings to the job are more important than the things he or she will learn on the job.
<ul style="list-style-type: none"> • The new employee must learn the job rapidly and adapt equally rapidly to job changes. 	<ul style="list-style-type: none"> • The new employee will have plenty of time to learn the job and can expect to deal with few, gradual changes, if any.
<ul style="list-style-type: none"> • Two or more top job candidates are practically equal in terms of key skills and abilities. 	<ul style="list-style-type: none"> • One job candidate is clearly superior to the others in terms of key skills and abilities.

FIGURE 4

When It Makes Sense to De-emphasize Precise Matching of Knowledge, Ability and Skill Profiles and to Focus on General Intelligence and Conscientiousness

under their supervisor's direct gaze. The pace at which others work and the methods they use are spelled out in excruciating detail and any departure is instantly obvious. The archetypal assembly line job scores high in this respect. Other jobs stand in stark contrast,²⁸ and require independent initiative. Other things being equal, conscientiousness is more likely to separate high performers from low performers in such low control—low structure jobs than it is in their high control—high structure counterparts.

- **When the Things New Employees Learn on the Job are More Important Than What They Bring to the Job.** Pilots, surgeons, lawyers, and plumbers bring a well defined set of skills to their jobs. Other jobs are different, however. New employees come to them with little or no direct preparation. They are expected to learn their jobs after they are hired, sometimes with the help of formal training, sometimes without. Sixty or 70 percent of jobs probably fall into this category. For these jobs, the ability and drive to learn the new assignment is paramount, making general intelligence and conscientiousness important keys to success.
- **When the New Employee Must Learn the Job Rapidly and Adapt Equally Rapidly to Job Changes.** High general intelligence is consistently associated with the ability to grasp new information. Conscientious candidates are likely to strive to do so. Thus, both g and conscientiousness probably characterize individuals who will learn new jobs quickly and deal effectively with change.
- **When Two or More Top Job Candidates are Just About Equal in Terms of Knowledge, Skills, and Abilities.** Even in jobs that demand precise matching, the selection process sometimes yields two or more top candidates who are evenly matched in terms of specific requirements. In such cases, the candidate who scores highest in terms of g and conscientiousness is the better choice.

Measuring g and Conscientiousness

If employers are to use conscientiousness and general intelligence in selecting employees, they must be able to measure each.

Using Paper-and-Pencil Instruments. A number of accepted paper-and-pencil tests of general intelligence and conscientiousness are available. For example, one can select from among the numerous measures of g discussed in books such as Aikin's *Assessment of Intellectual Functioning*.²⁹ The revised NEO-Personality Inventory is widely

used to measure conscientiousness and the other four Big Five dimensions.³⁰

Industrial/organizational psychologists can help managers find paper-and-pencil measures that may meet their needs. Even more importantly, they can spell out the steps federal and state governments require employers to take to validate these instruments. They also can explain why the fact that existing paper-and-pencil measures of conscientiousness are, for the most part, easily faked by clever job candidates does not create major problems in using them to select employees.³¹ Such questionnaires are not the main focus of this discussion, however.

We concentrate here on a few of the clues candidates high in general intelligence and in conscientiousness leave in their resumes and in job interviews. It is reassuring to learn that managers can and do recognize the importance of g and conscientiousness in choices that they make from among job candidates. Dunn, Mount, Barrick, and Ones asked 84 managers who make hiring decisions to rate 39 hypothetical job applicants in terms of their hirability and counterproductivity. They found that g and conscientiousness were the best predictors of the managers' ratings of hirability and, along with low emotional stability and low agreeableness, of ratings of counterproductivity.³² Similarly, Mount, Barrick, and Strauss found that supervisor, coworker, and customer ratings of conscientiousness were accurate predictors of sales representatives' performance ratings.³³

Reading Resumes and Interviewing for Evidence of g. Looking for g is relatively easy, as such things go, since a number of readily observable personal history items correlate highly with general intelligence:

- **School Grades.** School grades do not indicate g perfectly. Individuals may over- or underachieve relative to their intelligence for a variety of reasons.

School grades do not indicate g perfectly. Individuals may over- or underachieve relative to their intelligence for a variety of reasons.

Differences in school quality and in cultural and family emphasis on the importance of academic performance may handicap some students, for example. Such things aside, however, the relationship between school grades and g is very strong.

- **Vocabulary.** Language facility also relates highly to g. Indeed, critics argue that some measures of intelligence are little more than disguised tests of vocabulary and reading ability.
- **Problem-Solving Success.** Many jobs and hobbies involve problem solving. Previous success in such activities suggests that a candidate has a high level of general intelligence.

Reading Resumes and Interviewing for Evidence of Conscientiousness. Psychologists have not studied the clues managers can use in judging candidates' conscientiousness. Anything we say on this issue is therefore highly speculative. However, we can build on the definition of conscientiousness that says that conscientious individuals are achievement-oriented, careful, hard-working, organized, planful, persevering, responsible, and thorough to tentatively suggest that those making hiring decisions should look at nature and quality of the candidates':

- **Preparation for the Interview.** The job candidate who arrives at the interview having carefully researched the firm and the job opening, is probably more conscientious than the one who arrives uninformed.
- **Dress and Self-Presentation.** In the same fashion, the candidate who arrives dressed appropriately shows at least some of the signs of conscientiousness.
- **Career Progression.** Careful career planning, as well as careful planning in other aspects of an individual's life, would appear to be an attribute of those high in conscientiousness. Thus a logical progression as the job candidate moves from position to position would likely indicate a conscientious individual.

Conclusion

The challenge raised by Bill Gates and other managers to the conventional wisdom of precise matching has solid support not only in their experience, but in carefully crafted, widely repeated research. Study after study indicates that general intelligence and conscientiousness relate strongly to performance across a wide range of jobs and situations. Clearly the time has come for those who set hiring policy to raise their own challenge to human resource managers and industrial psychologists who administer their firms' hiring programs:

- To determine exactly what role g and conscientiousness play in success in key jobs in their firms and, where appropriate,

- To find reliable and valid ways of measuring these key variables so that they can be made part of their selection programs.

When these determinations have been made, firms will have taken an important step in assuring that they staff their operations with those who have the highest chance of contributing the most.

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²⁸ Mischel, D. refers to these jobs as "weak" situations in his 1977 work: The interaction of the person and the situation. In D. Magnusson & N. S. Miller, (Eds.) *Personality at the crossroads: Current issues in interactional psychology*. Hillsdale NJ: Erlbaum.

²⁹ Aikin, H. R. 1996. *Assessment of intellectual functioning*. New York: Plenum Press.

³⁰ Costa, P. T., Jr. & McCrae, R. R. 1985. *The NEO personality inventory*. Odessa FL: Psychological Assessment Resources.

³¹ Recent work (Schmit, M. J., Ryan, A. M., Stierwalt, S. L. & Powell, A. B. 1995. Frame-of-reference effects on personality scale scores and criterion-related validity. *Journal of Applied*

Psychology, 80: 607-620) indicates that application-related instructions and work-related items led subjects to practice impression management, but this actually led to greater rather than less validity. Studies (Barrick, M. R. & Mount, M. K. 1996. Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology*, 81: 261-272 and Ones, D. S., Viswesvaran, C. & Reiss, A. D. 1996. Role of social desirability in personality testing for personnel selection: The red herring. *Journal of Applied Psychology*, 81: 660-679) indicate as well that the fact that applicants may slant their answers in socially-desirable directions does not significantly affect the usefulness of personality measures in selecting employees.

³² Dunn, W. S., Mount, M. K., Barrick, M. R. & Ones, D. S. 1995. Relative importance of personality and general mental ability in managers' judgments of applicant qualifications. *Journal of Applied Psychology*, 80: 500-509.

³³ Mount, M. K., Barrick, M. R. & Strauss, J. 1994. Validity of observer ratings of the big five personality factors. *Journal of Applied Psychology*, 79: 272-280.

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