

# Cognitive ability on job performance



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The recruitment of successful and productive employees is incredibly important for organizations. There are many available tools for organizations to make careful selections. Organizations can set minimum qualifications, utilize personality assessments, require work samples or work simulations, and perform cognitive ability testing among other options. Spector (2012) discusses the criterion-related validity approach to selecting employees. There are two parts to this approach. The first is to develop the criteria for what employee performance should look like. Predictors that relate to the established criteria can be used to select the best candidates for a job.

Per Spector (2012), cognitive ability is an effective predictor of job performance. As such, it makes sense for organizations to rely, at least in part, on cognitive testing because there are multiple benefits. Cognitive testing can measure math, language and problem solving skills among other aspects. Aside from its role in predicting job performance, cognitive testing is an affordable practice that can be used to screen multiple applicants at the same time (Spector, 2012). Cognitive abilities are important to all jobs in that they “ are relevant to tasks that involve information processing and learning” (Spector, 2012, p. 111). These are obviously important aspects to all jobs, but they vary in importance based on job complexity, and the relevance of cognitive ability to job performance strengthens for more demanding jobs (Spector, 2012).

## Literature Review

Hunter (1986) performed a meta-analysis of existing research to examine the predictive effects of cognitive ability on job performance. He suggested

that cognitive ability is an effective predictor for success across all jobs and that sufficient research confirms such empirically. There are multiple reasons why general cognitive ability might be relevant across all jobs. Research showed that “cognitive ability determines how much and how quickly a person learns,” and that “cognitive ability predicts the ability to react in innovative ways” (Hunter, 1986, p. 342).

Given that cognitive ability is a valid and effective predictor of job performance, it is important to establish how effective it is relative to other metrics. Hunter (1986) considered general cognitive ability the best, known predictor of job performance for jobs with provided training. This qualification isolates cognitive ability from existing job knowledge. Per Hunter (1986), the ability to learn job knowledge follows from cognitive ability, and therefore cognitive ability is such a good predictor of job performance. He acknowledged that cognitive ability plays a role in job performance beyond job knowledge acquisition. Hunter’s (1986) research focused on civilian and military jobs in the United States.

#### Universality of the predictive relationship

I-O psychology has much of its research rooted in the United States of America (Spector 2012). As such, it is important to corroborate against research performed in other regions. This is what Salgado et al. (2003) set out to do. Salgado et al. (2003) performed a meta-analysis on general mental ability (GMA) as a predictor of job performance in European countries across a variety of occupations. I-O psychology has much of its research rooted in the United States of America (Spector 2012). As such, it is

important to corroborate against research performed in other regions. This is what Salgado et al. (2003) set out to do. Of the occupations examined, GMA was found to be a valid predictor, except for police jobs, but the authors acknowledge that this exception could be due to an outlier effect and needs further research. This meta-analysis provides strong evidence that cognitive testing is an important part of employee selection, and it confirms that effects found in United States based studies are more universal and not simply products of cultural and historical processes.

#### Broad versus narrow measures

Contrary to Hunter's (1986) belief that general cognitive ability is the best predictor of job performance, Lang, Kersting, Hulsheger and Lang (2010) show that while GMA is predictive of job performance, it is often not the best predictor. The researchers examined the differences between a more traditional two-factor model and a nested-factor model of cognitive ability. The nested-factor model allowed the researchers to study the predictive effects of both GMA and subsets of cognitive ability.

Lang et al. (2010) concluded that GMA is a valid predictor and accounts for between 15.3% and 24.9% of the variance, but they also concluded that verbal comprehension is a more powerful predictor of job performance for some jobs. Verbal comprehension was a better predictor only under the nested-factors model. The authors acknowledged that both models should be used, and that the different conclusions are related to differences in the theoretical assumptions. They further broke down jobs into high and low

complexity jobs. GMA is a better predictor for performance in high complexity jobs.

#### Agreement among IO psychologists

From the research presented so far, clearly, cognitive ability is an important predictor for job performance. Organizations keen on hiring the best employees would be wise to utilize it. Despite the consensus that cognitive ability is a valid predictor, there is still disagreement within the field about aspects of the relationship between cognitive ability and performance.

Murphy, Cronin and Tan (2003) surveyed members of the Society for Industrial Organizational Psychology. Per Murphy et al. (2003), cognitive testing is a controversial topic in I-O psychology, and there is concern about adverse impact on minority groups and whether cognitive testing truly captures intelligence. The researchers attempted to find where I-O psychologists agree and disagree about the validity and role of cognitive ability testing. Survey respondents were asked to provide demographic information and rate their agreement with 49 statements.

The researchers found consensus that cognitive testing is fair and valid, that the tests do capture intelligence, though not in its entirety, and that other qualities are important for predicting job performance. Additionally, the SIOP members agreed that adverse impact effects of cognitive testing need to be addressed. The SIOP members agreed that diversity in organizations is valuable, and that cognitive ability testing should be used carefully to maintain diverse workforces. There is controversy over the social impacts of cognitive testing and about how well testing captures a full measure of

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intelligence. Murphy et al. (2003) concluded that while there is diversity of opinion within IO psychology, for the most part it is over details and not overarching fundamental differences.

## Conclusions

Organizations are always looking for ways to improve employee recruitment. Many already utilize cognitive ability testing. There is a strong consensus among IO psychologists that this is an effective practice (Murphy et al., 2003). The current body of research shows that cognitive ability, whether general or a narrowly defined area, may be the best predictor of job performance (Lang et al., 2010). There is evidence that the relationship between cognitive ability and job performance is not a cultural phenomenon (Salgado et al., 2003). Organizations should still utilize the other tools available to hire the best employees.

There are important considerations that organizations need to keep in mind when using cognitive ability testing. The value of cognitive ability testing scales with job complexity, and rigorous cognitive ability standards might not be necessary for less mentally demanding occupations. There are potential legal ramifications. Cognitive ability testing might lead to adverse impact on hiring practices (Spector, 2012). Beyond the legal issues, many workplaces value diversity and should be aware that cognitive testing might screen out minority applicants. Used thoughtfully, cognitive ability testing is a valuable tool for organizations looking to hire the best applicants.