



Cognitive ability and socio-economic status relations with job performance



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ABSTRACT

The relative independence of cognitive ability measures from socio-economic status (SES) continues to be a source of debate in work and academic settings. This paper examines the contribution of cognitive ability and SES in predicting subsequent work performance and evaluations of career potential. When predicting job performance, SES contributed very little after controlling for cognitive ability. When SES was controlled, ability retained strong criterion related validity. However, in career potential ratings it was ability that contributed little after controlling for SES. Judgments of potential, but not the ability–performance relationship, are possibly unduly influenced by SES.

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1. Introduction

Continued questions remain about the independence of measures of cognitive ability from socio-economic status (SES) in the prediction of work outcomes. This concern was prominently discussed in psychology in McClelland's often cited paper in *American Psychologist* (McClelland, 1973). When reviewing some of the literature that describes positive relationships between ability measures and subsequent performance he argued that “the correlation between intelligence test scores and job success often may be an artifact, the product of their joint association with class status” (p. 3). Similar perspectives exist in educational admissions including recent publications which have argued that cognitive ability measures fail to predict academic performance after SES is controlled (Biernat, 2003; Crosby, Iyer, Clayton, & Downing, 2003). The fundamental argument here is that prior SES is strongly captured in ability

measures which, in turn, control opportunities for higher education and these academic credentials then control entry into high prestige jobs. Therefore, the argument goes, the association between ability and occupational success and performance is illusory as tests are only related to other tests (i.e., grades), grades are unrelated to work outcomes, and access to higher education is a social class driven credentialing process that is unrelated to actual merit.

Many components of these arguments are not supported by the data. Standardized admissions tests predict a range of complex academic outcomes beyond grades, including job performance, directly countering the argument that tests merely predict other tests (e.g., Kuncel & Hezlett, 2007; Kuncel, Hezlett, & Ones, 2004). Even if the relationship was principally with grades, grades themselves are predictive of subsequent job performance and income (Roth, Be Vier, Switzer, & Schippmann, 1996; Roth & Clarke, 1998). In addition, a sizable literature exists in the educational domain that has examined the relations among ability, SES, and academic performance and found that, even when controlling for multiple measures of SES, the relationship between cognitive ability measures and academic performance remains

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largely unaffected (e.g., Sackett, Kuncel, Arneson, Cooper, & Waters, 2009; Sackett et al., 2012; Zwick, 2004). However this literature does not directly speak to the work domain.

In the work domain, Barrett and Depinet (1991) provided a critique of the SES argument and cited considerable evidence that SES both has small relationships with subsequent occupational attainment (one conceptualization of job success) and smaller relationships with cognitive ability than ability has with performance. This paper is part of a very large literature on the relations among ability, education, and subsequent occupational attainment where attainment is typically operationalized by career status or annual income. Research going back to early work by Blau & Duncan (1967) has indicated that cognitive ability exerts the largest influence on occupational attainment through educational attainment and that this connection is stronger than those observed for family SES variables. Subsequent research has corroborated this conclusion and provided additional evidence of smaller but direct connections between cognitive ability and occupational attainment even with family SES and educational attainment controlled (e.g., Duncan, Featherman, & Duncan, 1972; Jencks, 1979; von Stumm, Macintyre, Batty, Clark, & Deary, 2010). The relationship between ability and attainment appears to be ongoing in that workers will move up or down in occupational status when there is a mismatch between their ability and the complexity of their job (Wilk, Desmarais, & Sackett, 1995; Wilk & Sackett, 1996). Linked with Barrett and Depinet (1991) this literature provides compelling evidence that the ability/occupational attainment link may be influenced by, but is not merely an artifact of, social class. Yet, attainment is only one aspect of work, job performance is of critical importance as well.

Almost no evidence has been presented that directly controlled for family SES in the prediction of performance on the job with cognitive ability. Although ability measures are some of the best predictors of how well people perform their job, the influences of SES on this relationship are rarely examined. The authors are aware of only one study (Colarelli, Dean, & Konstans, 1987) examining actual supervisory ratings of job performance in conjunction with social class and cognitive ability. However, this study of accountants reports near zero correlations of cognitive ability with SES and job performance variables. This pattern is inconsistent with the overall patterns observed in the literature. In addition, SES and college GPA variables were also near zero which is, again, a lower correlation than typically observed in the literature (e.g., Sackett et al., 2009; Strenze, 2007).

This study aside, nearly all of the counter evidence rests on research using education levels (as a proxy for SES) to demonstrate that despite low variability in SES within a jobs cognitive ability remains a valid predictor of job performance. A direct test of this question is needed but is nearly nonexistent because organizations do not collect family SES data from job applicants simply because most employers are, logically, concerned with the current abilities of applicants rather than the wealth and education of the applicant's parents. In addition, it would be difficult to argue that such information is job relevant, making any legal defense difficult.

This study presents rare data from a range of occupations and examines the contribution of SES or cognitive ability when one is conditioned on the other in the prediction of supervisory evaluations of both job performance and career potential.

Based on the literature from academic settings we expect that SES will add little to the prediction of job performance after ability is controlled. In contrast we expect that ability will remain a robust predictor of job performance if SES is controlled. Potential ratings appear to have different relations with some psychological assessments than do job performance ratings (e.g., Gaugler, Rosenthal, Thornton, & Bentson, 1987). Potential ratings may be more heavily anchored in general non-work related impressions. Additionally, occupational attainment does have modest but positive relationships with measures of SES suggesting a possible connection. Therefore, we expect that the relationship between ability and potential ratings will be more strongly affected by SES than for job performance. Again, in contrast to our expectations for job performance, we expect that when predicting career potential ratings, SES will not disappear as a predictor when conditioned on ability. Nevertheless, we expect cognitive ability to be the stronger predictor for both sets of relations.

2. Method

2.1. Participants

The participants were 108 job incumbents from a cross-section of jobs with the following breakdown: general laborer (11%), transportation services (2%), customer service (12%), skilled trades (10%), administrative/clerical (14%), manager (11%), public safety (6%), supervisor (4%), professional/individual contributor (29%), and executive (1%).

The gender composition of the participants was 50 (46.3%) males and 58 (53.7%) females. Of the participants who provided information regarding their highest educational qualifications, 29 (26.8%) reported having a Masters degree or higher qualification, 5 (4.6%) reported having done some post-graduate work, 32 (29.6%) reported having a Bachelors degree, 26 (24.1%) reported having some college, and 16 (14.8%) reported having a high school diploma or GED (education correlates .02 with job performance in this heterogeneous sample). Participants reported ethnic group information as follows: 96 (88.9%) White (non-Hispanic), 2 (1.9%) Black/African American, 6 (5.6%) Hispanic/Latino(a), 3 (2.8%) Asian/Pacific Islander, and 1 (0.9%) Other.

2.2. Measures

The 40-item Watson–Glaser Critical Thinking Appraisal – Short Form (Watson & Glaser, 1994), and the 32-item Advanced Numerical Reasoning Appraisal (ANRA; Rust, 2006), were used to measure cognitive ability. Specifically, a cognitive ability composite was created by converting Watson–Glaser and ANRA scores to z-scores and then averaging the z-scores.

The full scale scores from the Watson–Glaser were used as a measure of cognitive ability. Its five subscales (Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments) are composed of scenarios similar to those typically found in a variety of settings, including the workplace, the school, and other organizational settings. Each scenario is followed by a number of items for the participant to respond to, with response options ranging from 2 for some items to 5 for other items. The maximum total raw score on the

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