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Discounting IQ's Relevance to Organizational Behavior: The "Somebody Else's Problem" in Management Education

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Abstract

We hypothesize the existence of a "somebody else's problem" in management education for the sub-discipline of organizational behavior (OB). The problem regards human intelligence, specifically, the general factor, *g*. Although *g* is arguably the most powerful variable in social science, OB educators largely ignore it. To demonstrate the former, we review a vast literature establishing *g*'s construct validity. To demonstrate the latter, we show that current OB textbooks place far less emphasis on *g* relative to a popular but less potent predictor of organizational success, emotional intelligence. We also show that when textbooks do reference *g*, it is often just to offer criticism. Misconceptions about empirical data on intelligence testing, denial that a general factor of intelligence exists, the reality of mean racial differences in mental ability, and the finding that genes play a non-trivial role in causing intelligence, seem to make OB's treatment of this topic "somebody else's problem."

Key words: Intelligence, Emotional intelligence, Organizational behavior

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Introduction

Organizational behavior (OB) textbooks contain perhaps the most interdisciplinary content in all of social science. They include lecture material from psychology, sociology, anthropology, political science, and economics. We argue here, however, that OB textbooks tend to ignore what is possibly social science's most powerful variable: IQ (more specifically, the general factor of intelligence, g , as derived from IQ test scores). OB textbooks discount the general factor to the point that when discussing intelligence, they often either criticize g , relegate its status as secondary to that of specific mental abilities, or focus more attention on other types of "intelligence" (e.g., emotional intelligence) that possess less predictive validity.

As reviewed below, g is typically measured as the first, un-rotated factor emerging from factor analysis on any diverse set of mental abilities tests. Statistically, g is the variance common to solving a math problem, defining a word, and reading a map. Biologically, g reflects the speed and efficiency with which brains process information. Psychologically, g is problem solving ability, and usually fares as one of the best predictors of important educational, organizational, and social outcomes. Yet OB educators mostly ignore it.

We suggest that popular misconceptions about intelligence (see, e.g., Gould, 1996) sour motivation to cover this topic in OB textbooks. Nonetheless, research articles addressing g 's validity are easy to come by, and they show that these widely-held views about g are urban legends. Instead, we hypothesize that fair treatment of g in OB education and elsewhere is suppressed by a psychological device: A "somebody else's problem."

An SEP is something we can't see, or don't see, or our brain doesn't let us see, because we think that it's somebody else's problem. The brain just edits it out; it's like a blind spot" (Adams, 1982, p. 118).

That the problem exists today is confirmed by the editor of the journal, *Intelligence*, who recently noted:

A serious problem for the field of human intelligence is that what people do know about intelligence is often wrong. If not outright wrong, it is often distorted through the lens of the popular press (Detterman, 2014, p. 149).

To document the problem's existence, we first debunk commonly-held misperceptions about g . Our rebuttal attempts to demonstrate that g has impressive construct and predictive validity. We then compare g 's coverage in current OB textbooks relative to a popular, less-potent predictor of performance, emotional intelligence. The specific beliefs we discredit include the: (1) Invalidity of factor analysis as used to measure g , (2) "fallacy" of assuming g is real merely because factor analysis quantifies it ("reification"), (3) belief that g has no basis in biology or the brain, (4) denial that race and IQ co-vary, (5) downplaying of IQ's genetic basis, and (6) claim that either specific or multiple intelligences predict outcomes better than does g .

On the Invalidity of Factor Analysis

Some (see, e.g., Gould 1996) believe that g is a statistical artifact, emerging from the arbitrary nature of factor analysis, and the intelligence researcher's misguided attempts to interpret correlations among cognitive ability test scores. It is admittedly counterintuitive that single IQ scores meaningfully reflect the vast array of human mental ability. However, IQ test scores do this precisely because they measure the general factor. Although other specific types of intelligence exist, g accounts for roughly 50 percent of their variance (Jensen, 1998; McGrew, 2009). g then likely reflects the speed and efficiency with which brains process most any perceptual or cognitive information (Jensen, 2011).

Evidence for these claims comes primarily from a factor analytic literature spanning one century. This literature has produced one of the most replicated findings in social science: The "law" of positive manifold (Jensen, 1998). Scores on surprisingly diverse sets of mental-abilities tests correlate positively. Pesta and Poznanski (2009), for example, reported robust correlations between diverse measures of IQ, such as reaction

time, inspection time, over-claiming, the General Management Aptitude Test, and the Wonderlic Personnel Test.

Most experts today accept that human cognitive abilities align in hierarchical order. For example, in the Cattell-Horn-Carroll (CHC) model, cognitive abilities form a three-stratum hierarchy (Carroll, 1993; McGrew, 2009). The apex contains a single general factor, *g*, which correlates strongly with all factors below it. The middle of the hierarchy consists of several broad abilities (e.g., processing speed; short-term memory). Several dozen narrow mental abilities (e.g., perceptual speed; word fluency) comprise the lowest stratum.

On the Fallacy of Reification

The “fallacy of reification” (see, e.g., Gould, 1996) occurs when researchers interpret factors emerging from factor analysis as reflecting “real things” and / or “real properties” of the brain. In intelligence research, factor analytic derivation of *g* proves only its statistical existence. However, existence as a psychological construct (e.g., personality, motivation, self-esteem, leadership, love) can be established by validation with other psychological constructs. Likewise, existence as a biological construct can be established by validation with brain / body function and morphology.

So many important variables covary with *g* (from semen quality to leadership success) that researchers have postulated the presence of a broad nexus to best describe these interrelationships (Jensen, 1998; Pesta, McDaniel, & Bertsch, 2010). To illustrate, here we cite just meta-analytic literature showing variables contained within the *g* nexus: (1) **Cognitive**: Inspection time (i.e., a measure of the brain's ability to quickly absorb information; Grudnik & Kranzler, 2001), reaction time (i.e., a measure of the brain's ability to quickly process information; Sheppard & Vernon, 2008), and working memory (i.e., the brain's mental workbench; Ackerman, Beier, & Boyle, 2005). (2) **Health**: Lead exposure (Needleman & Gatsonis, 1990), fluoride exposure (Tang, Ma, Jiang, & Zhou, 2008), iodine exposure (Qian et al., 2005), and all-cause mortality (Calvin et al., 2010). (3) **Success**: Leadership (Judge, Colbert, & Remus, 2004), socioeconomic success (Strenze, 2007), and job performance / trainability (Schmidt & Hunter, 2004). (4) **Interpersonal**: self-efficacy (Judge et al., 2007), interpersonal sensitivity (Murphy & Hall, 2011), delay discounting (Shamosh & Gray, 2008), and religiosity (Zuckerman, Silberman, & Hall, 2013).

The above list shows that *g* has non-trivial predictive validity in many life domains. If realness can be inferred by construct validation, then *g* is a real psychological construct. This is especially true given other psychological constructs with less remarkable validation records (e.g., multiple intelligences) whose realness is seemingly conventional wisdom.

On the Biological Basis of *g*

The following illustrates *g*'s basis in biology. It is a non-exhaustive list of *g*'s correlations with brain / body function and morphology: (1) Brain size (McDaniel, 2005), (2) the arborization of cortical neurons (Ceci, 1990), (3) cerebral glucose metabolism (Haier, 1993), (4) evoked potentials (Barrett & Eysenck, 1992), (5) nerve conduction velocity (Rijsdijk & Boomsma, 1997), (6) sex hormones (Christiansen & Knussmann, 1987), (7) semen quality (Arden, Gottfredson, Miller, & Pierce, 2009), (8) cranial and motor nerve function (Arden, Gottfredson, & Miller, 2009), (9) serum cholesterol (Corley, Starr, & Deary, 2014), (10) atherosclerosis (Roberts et al., 2013), (10) blood pressure (Starr et al., 2004), and (11) the incidence of obesity, diabetes, high blood pressure, stroke and metabolic syndrome across the 50 U.S. states (Pesta, Bertsch, McDaniel, Mahoney, & Poznanski, 2012).

Relationships between *g* and health are ubiquitous and striking. Arden et al. (2009) postulated the existence of a general fitness factor to explain links between these constructs. We suspect that Jensen's (1998) *g* nexus, Pesta et al.'s (2010) well-being nexus, Kirkegaard's (2014) socioeconomic factor, and Arden et al.'s (2009) general fitness factor are converging on the same constructs.

On Race and IQ

No issue in science is more controversial than that of group mean differences in human mental ability. Its mere mention has caused riots (Modgil & Modgil, 1987), threatened careers (Gottfredson, 2010), and (we suspect) strongly reinforced the “somebody else’s problem” in OB education and elsewhere.

Data on race and IQ go back to at least World War I (Jensen, 1998). This century, Roth, Bevier, Bobko, Switzer, and Tyler (2001) conducted a large-scale meta-analytic summary of these effects ($N = 6,246,729$ people). Black / White differences in mean IQ scores are quite large, although the distributions overlap considerably across groups. Overlapping distributions indicate that millions of minorities score higher on IQ tests relative to tens of millions of Whites, just in the USA. Nonetheless, many of the effect sizes exceed 1.0 (Roth et al., 2001). Finally, debate exists about whether these gaps have recently narrowed, but no one has yet determined the cause of race differences in intelligence, nor how to meaningfully reduce them.

A substantial literature reveals that IQ tests simply are not statistically biased against minorities (Jensen, 1980; Neisser et al., 1996). Rather than review various potential explanations for these effects, we cite a task force commissioned by the American Psychological Association (APA). Although somewhat dated, the task force still represents the APA’s current stance on race and intelligence:

The [difference] does not result from any obvious biases in test construction and administration, nor does it simply reflect differences in socioeconomic status... In short, no adequate explanation of the differential between the IQ means of Blacks and Whites is presently available (Neisser et al., 1996, pp. 96-97).

On Genes and IQ

The “somebody else’s problem” in OB education and elsewhere is also reinforced by the consistent finding that genes play an important role in determining individual differences in human mental ability. It is clear that genes substantially influence individual differences in many psychological traits, including intelligence (Bouchard, 2004). The evidence is so strong that the field no longer focuses on “whether” genes affect intelligence. Instead researchers study how heritability differs by “chronological age, epoch and social circumstance” (Gottfredson, 2009, p. 16).

Bouchard (2004) offered a sound summary of the literature in this area. For young children, environmental factors (e.g., parenting philosophy, socioeconomic status) strongly influence individual differences in intelligence. Surprisingly, the effects of “shared environment” gradually drop to approximately zero as children mature into adulthood. Multiple lines of evidence confirm this conclusion, including studies using twins and siblings (raised in either the same or different environments) or adoptees. By the time people reach working age and organizational behaviors become salient, approximately 85% of the variance in IQ test scores is caused by genes.

On the Specificity Doctrine

Consider the following three quotations, each from a different OB textbook:

(1) Thus, managers must decide which mental abilities are required to successfully perform each job. For example, a language interpreter...would especially need language fluency (Gibson, et al., 2012, p. 90).

(2) ... different jobs require various blends of these [mental] abilities. As some obvious examples, writers have to be adept at word fluency, statisticians have to be good at numerical ability and numerical reasoning, and architects have to be skilled at spatial visualization (Greenberg, 2013, p. 131).

(3) Research suggests that cognitive ability predicts performance on the job, as long as the ability in question is relied on in performing the job. (George & Jones, 2012, p. 53).

These claims are factually incorrect, as they illustrate the now-falsified, *situational specificity* hypothesis (see, e.g., Schmitt & Hunter, 1977).

Almost 100 years ago researchers noticed that the validity of any given IQ test often varied considerably from study to study. Even for the same jobs in different organizations, validity coefficients were seldom identical (Schmidt & Hunter, 1977). The situational specificity hypothesis offered a non-parsimonious explanation for these findings. The idea was that unknown features of a “work situation” exist in every job-validation study. These features cause the same IQ test to predict performance in some situations, but not in others. Validity estimates are therefore confounded by unknown, situation-specific factors that should be accounted for when attempting to predict job success.

The presumed solution was job analysis. Detailed studies were required to identify the unique knowledge, skills, and abilities needed to do this specific work in that specific organization. However, no matter how detailed and thorough, job analysis was unsuccessful at finding these factors. Instead, empirical estimates of IQ's validity were derived and classified separately by jobs and organizations.

Schmidt and Hunter (1977, 2004) demonstrated the true unknown responsible for these discrepancies: Random sampling error and its artifactual associates (i.e., across-study differences in measurement error and range restriction). Once adjusted for these artifacts, IQ test scores robustly predict job performance.

To g or Not to g

Conventional wisdom wrongly suggests that IQ tests reflect only narrow academic skills of no real-world import. Instead, the presumed existence of multiple intelligences captures the public's fascination. Consider the popularity of Gardner's (1983) theory of “multiple intelligences.” Via Google Scholar, *Frames of Mind* (Gardner, 1983), has been cited 20,694 times in various literatures.

Gardner hypothesized that unique, relatively uncorrelated, intelligences exist, and that they rival *g* in terms of importance. However, no one has produced data contradicting the “law” of positive manifold (for a review, see Wilson, 2012). Instead, scores on diverse sets of mental tests correlate positively.

Another “intelligence” celebrated as predictor of organizational outcomes is emotional intelligence (EQ). EQ is the ability to identify, monitor and accurately use information about emotional states (Goleman, 1996). EQ indeed matters in organizational settings, but its power to predict success is exaggerated relative to IQ (see, e.g., Joseph, Jin, Newman, & O'Boyle, 2014; Landy, 2005). Also problematic is EQ's construct validity, as some claim it may merely be a repackaged version of the *Big Five* personality traits (Conte, 2005; Robbins & Judge, 2015).

Despite these criticisms, EQ remains widely popular in both research and educational settings. Goleman's (1996) book, *Emotional Intelligence*, has been cited 18,037 times in various literature. Enthusiasm for EQ has also infected authors of organizational behavior textbooks. Notwithstanding decades of meta-analytic literature on IQ and job performance, Hellriegel and Slocum (2011) asserted:

Studies have consistently shown, for example, that the attributes associated with emotional intelligence...are twice as important for career success as intelligence (IQ) or technical competencies. (p. 84)

We next test whether OB textbook authors devote more attention to EQ or to IQ (and whether coverage of each is accurate or critical). The textbook survey could help prove that *g* is somebody else's problem in OB education. For example, in one surveyed textbook (556 pages), just the following sub-headings appeared in the subject index under “Intelligence:” Cultural, Emotional, Moral and Social. For reasons reviewed above, we predict that OB textbooks will focus more on EQ relative to IQ, and that coverage of especially the latter will sometimes be either inaccurate or critical.

Method

Sample and Design

We used the website, *Coursesmart.com*, to select nine OB textbooks, each written by different authors. Textbook selection was random, except that we sampled only texts that were currently-used, recent editions from one of the “big three” publishers: Cengage, McGraw Hill, and Pearson (we selected three texts from each of these publishers). We then conducted searches in these books looking for coverage of either “IQ” (i.e., specific mention of *g*), or “EQ” as a comparison group.

We coded variables that would most strongly suggest the existence of a “somebody else’s problem” in OB education. Our survey therefore constituted a 2 (IQ, EQ) x 2 (accurate, inaccurate) x 2 (critical, noncritical) factorial design, with paragraph frequency as the dependent variable. Examples of accurate / inaccurate coverage of IQ included mention that it is a strong predictor of job performance, versus mention that specific mental abilities predict better (see the appendix file for several examples). Examples of accurate / inaccurate coverage of EQ included mention of its criterion validity, versus mention that it predicts job performance better than does *g*. Examples of critical coverage of IQ were comments about the ethics of IQ testing; whereas, examples of critical coverage of EQ were claims that it is perhaps a repackaged measure of the *Big Five*.

We also coded the number of graphs, tables, and other “bonus content” (e.g., surveys measuring EQ) devoted to each intelligence. For IQ bonus content, we counted any table or figure of mental abilities, as long as it also included the general factor. If bonus content made text-based claims about IQ or EQ, we included them in our overall paragraph counts for that book. Finally, two co-authors of the present paper conducted searches independently, so that we could measure inter-rater reliability (average $r = .86$). Disagreement was resolved via discussion and then consensus on all coded paragraphs.

Results

Table 1 lists the number of paragraphs each textbook devoted to IQ and EQ by accuracy and criticality, together with the frequency of bonus content. The table also includes a subjective, “five-star” ranking of each text, based on the depth and fairness of its treatment of *g*, in our opinion. Statistical analyses comprised chi-squares.

Table 1
Paragraph Counts, Bonus Content, and Five-star Ratings of Various Organizational Behavior Textbooks

First Author	IQ (<i>g</i>)			EQ			Bonus Content		Five-star rating
	Paragraphs Total	Accurate (<i>n</i>)	Critical (<i>n</i>)	Paragraphs Total	Accurate (<i>n</i>)	Critical (<i>n</i>)	IQ (<i>n</i>)	EQ (<i>n</i>)	
Newstrom	0	0	0	2	2	0	0	1	*
Gibson	3	1	2	13	13	1	0	1	**
Kreitner	4	4	1	6	6	1	0	2	****
Greenberg	13	7	10	9	9	0	1	2	*
Robbins	9	9	2	12	12	6	1	2	*****
George	4	2	1	8	8	0	1	2	***
Griffin	1	1	0	2	2	0	0	0	*
Hellriegel	0	0	0	4	3	0	0	1	*
Nelson	1	1	0	7	7	0	0	0	**
Totals¹	35	25 (71%)	16 (46%)	63	62 (98%)	8 (13%)	3	11	--

<i>Mean frequency</i>	3.89	2.78	1.78	7.00	6.89	0.89	0.33	1.22	2.2 (*'s)
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¹ Percentiles in this row equal the cell's frequency divided by the total number of paragraphs for the IQ or EQ category.

From the table, the number of paragraphs devoted to either IQ or EQ was surprisingly small, given that OB textbooks often exceed 500 pages. Nonetheless, when the authors of our nine, sampled textbooks referenced "intelligence," they devoted nearly twice as many paragraphs to EQ (63) relative to IQ (35), $\chi^2(1) = 8.00, p = .005$. Likewise, the number of bonus-content items devoted to EQ (11) was over three times that devoted to IQ (3), $\chi^2(1) = 4.57, p = .0325$. Coverage of EQ was also considerably more accurate (98%, relative to 71% for IQ), $\chi^2(1) = 16.4, p = .0001$. We found only one example of an inaccurate claim about EQ (i.e., Hellriegel & Slocum, 2011, although the authors did provide citations supporting their claim). Critical coverage of IQ (46%) was far more frequent relative to that for EQ (13%), $\chi^2(1) = 13.3, p = .0003$. That is, to the extent texts did reference IQ, almost half the time it was to offer criticism.

Discussion

We attempted to expose the "somebody else's problem" in OB education by first reviewing literature establishing *g*'s reality, validity, utility and importance. That *g* seems to be "somebody else's problem" was then confirmed by our OB textbook survey. Textbooks reflect what material is considered important, or at least worthy of mention, for students in discipline. Given the construct validity of *g*, as reviewed above, its relative absence in OB texts is unfortunate. OB authors should consider increasing coverage of *g* in their textbooks. Educators should do likewise in their OB classrooms. A level of coverage meeting that of EQ's in current OB textbooks appears reasonable.

We also hypothesized that the "somebody else's problem" is reinforced by the findings of race differences in, and genetic links to, intelligence. What consequence are the former to organizational behavior? Diversity issues are directly relevant to every organization; so too are discrimination lawsuits. Using cognitive abilities tests in employment decisions creates substantial "disparate impact." This is a potentially illegal form of discrimination where a neutral employment practice harms a protected class (see, e.g., *Griggs v. Duke Power*, 1971). In our experience, however, most business students have never heard of the *Griggs* case, nor realize the scope of the disparate impact created by testing for cognitive ability.

Some disclaimers are in order. Although we argue that *g* is the most powerful variable in social science, it is not the only individual difference that matters. Personality, including EQ, predicts organizational outcomes as well. Further, although IQ tests produce predictive validities as high as .50 for some organizational outcomes (e.g., job performance), much of the variance associated with these outcomes remains unexplained by *g*. Finally, the sensitive nature of race differences in human ability (though directly relevant to organizations via issues like diversity, affirmative action, and disparate impact) demands that educators use discretion when (and if) covering this topic.

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BP conceived the essay. All authors contributed to writing and revising the various sections. BP and PP conducted the textbook survey. The article was not funded, and there are no known conflicts of interest.

Peer review and supplementary materials

The peer review history is publicly available in [the submission thread](#). Data files and earlier drafts are available in the forum thread and also at [the Open Science Framework repository](#).

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