Intelligence as a Powerful Catalyst of Job Performance: Evidence from Highly Educated Workers

La inteligencia como un poderoso catalizador del desempeño laboral: evidencia en trabajadores con alta formación académica

Received: January 29, 2023; **Reviewed:** January 10, 2026; **Accepted:** April 22, 2026

Bruno Campello de Souza*
Federal University of Pernambuco, Recife, Pernambuco, Brazil
ORCID: https://orcid.org/0000-0002-6402-0233

Aparecida Regina Bezerra da Silva
Federal University of Pernambuco, Recife, Pernambuco, Brazil

Antonio Roazzi
Federal University of Pernambuco, Recife, Pernambuco, Brazil
ORCID: https://orcid.org/0000-0001-6411-2763

Abstract

This investigation tested the hypothesis that psychometric intelligence, as measured by IQ tests, is relevant for job performance in Brazil, particularly for more skilled occupations. Thus, a hypothetical-deductive, cross-sectional study was conducted among 134 Brazilian adult workers with a higher education degree or higher, using brief measures of IQ, personality, and leadership traits, as well as a sociodemographic and work-life questionnaire. Statistical analyses using the Canonic Test, Spearman's Correlation, and Logit Regression indicated that intelligence was positively correlated with self-rated job performance (rho = .17), with individuals scoring 111+ showing a substantially higher likelihood of above-par performance in more qualified positions (71.7% vs. 41.7%). At this higher level of intelligence, duration of employment also showed stronger associations with job position (rho = .40 vs. .08) and income (rho = .53 vs. .40). After controlling for personality, workload, and quality of working life, IQ remained the strongest independent predictor of above-par performance (*OR* = 8.774). Overall, the findings suggest that, among workers with higher education, intelligence constitutes a highly significant and independent component of workplace performance and occupational success.

Keywords

IQ; intelligence; job performance; working life; people management; decent work.

Resumen

Esta investigación puso a prueba la hipótesis de que la inteligencia psicométrica, medida mediante pruebas de CI, es relevante para el desempeño laboral en Brasil, particularmente en ocupaciones más calificadas. Para ello, se realizó un estudio hipotético-deductivo y transversal con 134 trabajadores brasileños adultos con título de educación superior, utilizando medidas breves de CI, personalidad y rasgos de liderazgo, así como un cuestionario sociodemográfico y de vida laboral. Los análisis estadísticos mediante la Prueba Canónica, la Correlación de Spearman y la Regresión Logit indicaron que la inteligencia se correlacionó con el desempeño laboral autoevaluado (rho = 0,17) y que los individuos con puntuaciones de 111+ presentaron una probabilidad sustancialmente mayor de reportar un desempeño superior en los cargos más calificados (71,7% vs. 41,7%). En este nivel más alto de inteligencia, la duración del empleo también mostró asociaciones más fuertes con el puesto ocupado (rho = 0,40 vs. 0,08) y con los ingresos (rho = 0,53 vs. 0,40). Tras controlar la personalidad, la carga de trabajo y la calidad de vida laboral, el CI se mantuvo como el predictor independiente más fuerte del desempeño superior (*OR* = 8,774). En conjunto, los hallazgos sugieren que, entre los trabajadores con educación superior, la inteligencia constituye un componente altamente significativo e independiente del desempeño laboral y del éxito ocupacional.

Palabras clave

CI; inteligencia; desempeño laboral; vida laboral; gestión de personas; trabajo digno.

How to cite [APA]:

Souza, B. C. de, Roazzi, A., & Silva, A. R. B. da. (2026). Intelligence as a powerful catalyst of job performance: Evidence from highly educated workers. *Acta Colombiana de Psicología*, *29*, 1–17. https://doi.org/10.14718/ACP.2026.29.13

* **Contact Information:** Departamento de Psicologia, CFCH, Universidade Federal de Pernambuco, Av. da Arquitetura, s/n, Cidade Universitária, Recife, PE, 50740-550, Brazil. Email: bruno.campello@ufpe.br

Authors' Notes:

Acknowledgments: The authors thank the undergraduate students of the 2nd course at UFPE for their assistance in data collection.

Conflicts of Interest: The authors declare no conflict of interest with respect to the research, authorship, or publication of this article.

Funding: This study did not receive specific funding from public, commercial, or not-for-profit funding agencies.

Open Access: The data used in this study are available from the corresponding author upon reasonable request.

Permission to Reproduce Material From Other Sources: No material from other sources requiring permission has been reproduced in this article.

Introduction

Intelligence, as measured by psychometric tests—either via an IQ score or broader estimates of general cognitive ability (g)—is one of the most robust and extensively validated constructs in psychology, with consistent links to educational attainment and multiple life outcomes. It has been tied to educational attainment and multiple important life outcomes (Eysenck, 1998; Firkowska-Mankiewicz, 2011; Hermstein & Murray, 1994; Hunt, 2011; Jensen, 1982; Lynn & Vanhanen, 2012; Neisser *et al.*, 1996; Sternberg *et al.*, 2001).

Numerous studies have shown evidence that intelligence is associated to job performance, career success and life outcomes, generally attributing this to the direct impact of intellectual ability on the capacity to better execute tasks, learn and make decisions (e.g., Anastasi & Urbina, 1997; Eysenck, 1998; Firkowska-Mankiewicz, 2011; Ganuthula & Sinha, 2019; Hermstein & Murray, 1994; Hunt, 2011; Jensen, 1982; Lynn & Vanhanen, 2012; Meisenberg, 2012; Neisser *et al.*, 1996; Scullin *et al.*, 2000; Sternberg *et al.*, 2001). However, some authors have argued that a relevant portion of the effect size may be due to self-fulfilling prophecies such as greater access to educational opportunities (Byington & Felps, 2010) or even to statistical and methodological issues (Richardson & Norgate, 2015), rather than to a per se impact of one's intellect. In spite of this, the bulk of the literature overwhelmingly favors the interpretation that the association between intelligence and individual achievement is causal, due directly to ability.

In Brazil, though the construct of intelligence and its testing is recognized as important (e.g., Righetto *et al.*, 2012; Silva *et al.*, 2012), the country has a poor track record regarding the matter, with most of the available instruments having poor psychometric qualities and there being no widespread use of adult scales (Noronha & Primi, 2004; Noronha *et al.*, 2002; Noronha *et al.*, 2003; Primi, 2010; Reppold *et al.*, 2017; Vendramini & Lopes, 2008; Wechsler *et al.*, 2019). Therefore, one can find only three Brazilian studies investigating the association between intelligence and job performance: one finding no direct relationship (Baumgartl & Nascimento, 2004), another observing a significant positive correlation between intelligence and supervisor-rated performance (Cobêro *et al.*, 2006), and the third a negative association between intelligence and workplace accidents (Baumgartl & Primi, 2006). This suggests that IQ may affect workplace performance in Brazil, as observed in other countries, but further studies are needed. Recent international meta-analyses continue to reinforce the centrality of cognitive ability in predicting workplace outcomes across cultures and occupational levels (e.g., Bertua *et al.*, 2022; Hambrick *et al.*, 2024; Salgado & Moscoso, 2019), highlighting the need for updated evidence from Brazil using validated adult measures. Moreover, contemporary organizational psychology emphasizes the joint contributions of intelligence, personality, and contextual factors to performance (Judge *et al.*, 2003), underscoring the importance of integrating these variables into empirical models.

The Pernambuco Adult Intelligence Mini Test (PAIMT) is a brief measure of general intelligence, which can be administered by non-professionals in five minutes or less, that was validated through a relatively large and varied sample of adults from the state of Pernambuco, Brazil, being not only a very practical research instrument, but one of the best normed tests in the country (Souza *et al.*, 2023). This makes it feasible to investigate the role of intelligence in employee performance in Brazilian organizations, with a broad scope that encompasses interactions with other variables such as education, training and development, personality, quality of working life, and more, while also addressing some of the historical deficiencies in intelligence testing in that country.

Building on this methodological foundation, the present paper examines how IQ relates to job performance in the context of these additional organizational variables, aiming to provide a more integrated and comprehensive understanding of the underlying mechanisms.

The present paper aims to explore the association between IQ and job performance in Brazil, considering multiple other factors to provide a holistic view of the mechanisms and processes involved. To situate this investigation within the broader scientific context, the

study also responds to two persistent gaps in the Brazilian literature: (a) the scarcity of empirical research using adult intelligence measures with robust validation, and (b) the limited examination of how intelligence interacts with other organizationally relevant variables such as personality, leadership traits, hyperculture, and quality of working life. By addressing these gaps, the study positions intelligence not as an isolated predictor, but as part of a broader constellation of individual and contextual factors that jointly shape workplace outcomes.

Based on the framework above, we tested three hypotheses: (H1) IQ is positively associated with self-rated job performance; (H2) this association remains significant after accounting for personality, leadership traits, hyperculture, and quality of working life; and (H3) the IQ–performance association is stronger in higher-complexity/higher-level roles. These hypotheses were operationalized using correlational analyses and logistic regression models, as described below (e.g., Hunt, 2011; Kaufman, 2009; Neisser *et al.*, 1996).

Psychometric Intelligence

The construct of intelligence is a set of cognitive abilities that emanate from speed of processing and working memory, among other basic processes, encompassing linguistic, logical-mathematical, and abstract thinking, as well as problem-solving, with enormous implications for clinical, educational and organizational purposes, including public policies (Anastasi & Urbina, 1997; Hermstein & Murray, 1994; Kaufman, 2009; Lynn & Vanhanen, 2012; Mackintosh, 2011; Neisser *et al.*, 1996). Some critics have suggested that IQ might not adequately reflect the broad scope of "human intelligence" (Gould, 1981; Schönemann, 1997; Sternberg & Wagner, 1993), tends to disfavor certain groups unfairly (Cronshaw *et al.*, 2006; Gould, 1981; Mackintosh, 2011), and makes use of outdated psychometric methodologies (Borsboom, 2006). However, such claims and/or their implications can, themselves, be disputed, and, even if they are considered to hold, they do not change the fact that measures of intelligence are extremely consistent and of great practical and scientific utility in almost all spheres of human life (Eysenck, 1998; Hunt, 2011; Jensen, 1982; Lynn & Vanhanen, 2012; Neisser *et al.*, 1996; Sternberg *et al.*, 2001). Indeed, it is so robust that it has even been possible to create a very short instrument capable of estimating IQs reasonably well in less than five minutes of testing (Souza *et al.*, 2023).

Intelligence and Real-Life Performance

There is substantial evidence that intelligence predicts occupational performance and life outcomes, though some question the magnitude and relevance of these findings and whether cognitive mechanisms are the primary explanation.

Reviewing several studies addressing criticisms of intelligence tests, Neisser *et al.* (1996) found correlations ranging from 0.3 to 0.5 between IQ and measures such as supervisor ratings and work samples, as well as with social status and income later in life, even after controlling for statistical reliability. In analyses involving multiple variables, it was often the best available predictor. Similar findings were later reported by many others (see Anastasi & Urbina, 1997; Eysenck, 1998; Firkowska-Mankiewicz, 2011; Ganuthula & Sinha, 2019; Hermstein & Murray, 1994; Hunt, 2011; Jensen, 1982; Lynn & Vanhanen, 2012; Meisenberg, 2012; Neisser *et al.*, 1996; Scullin *et al.*, 2000; Sternberg *et al.*, 2001). The explanation given for such associations is usually along the obvious lines that a higher capacity for pattern recognition, problem-solving, and learning tends to increase personal efficacy, efficiency, decision-making, and planning, with straightforward positive repercussions in workplace success.

Some authors acknowledge a strong association between IQ and job performance but suggest it is not a per se effect. Richardson and Norgate (2015), for instance, call attention to the possibility that a significant portion of those findings could be misleading due to statistical issues of poor data quality, small individual samples, selection bias, lack of controls for other variables, inadequate statistical corrections, and a disregard for the Flynn Effect. They also highlight that research on the subject tends to use a wide variety of mental ability tests, as well as subjective and inconsistent measures of job performance, particularly supervisor ratings. Byington and Felps (2010), on the other hand, suggest that the IQ-job performance correlation might be a self-fulfilling prophecy where, rather than excelling through better on-the-job learning, those with higher intelligence test scores have greater access to developmental resources, particularly formal education, enabling them to acquire additional capabilities over time and, ultimately, to perform their jobs better.

Of course, the objections raised by Richardson and Norgate (2015) could be interpreted as being a sign of

the robustness of the association between intelligence and job performance, rather than of it being an artifact, as the relationship consistently emerges in spite of a very broad and diverse set of studies with statistical limitations. The argument from Byington and Felps (2010) can also be refuted, as it ignores the fact that, by definition, qualification, both through education and by means of training and development, is not simply a formal requirement, but an actual practical necessity for performance in the workplace in all but the unskilled or semi-skilled occupations, making the ability to learn complex skills a concrete advantage.

Though the bulk of the evidence in the literature recognizes a causal association between intelligence and job performance, and the objections raised seem open to alternative interpretations, further studies on the subject, with better statistical controls and a wider range of variables, are still needed.

Intelligence Tests and Workplace Performance in Brazil

In Brazil, intelligence testing is characterized by multiple psychometric issues, including inadequate norming and extrapolated use, with the cost of standardization being one of the likely causes (Noronha & Primi, 2004; Noronha *et al.*, 2002; Noronha *et al.*, 2003; Primi, 2010; Reppold *et al.*, 2017; Vendramini & Lopes, 2008; Wechsler *et al.*, 2019). Also, most efforts have focused on children and adolescents rather than adults (Alves *et al.*, 2016; Campos & Nakano, 2012).

Given the status of intelligence testing in the country, especially for adults, it is difficult to find studies that have been done at all, let alone in the workplace. Only three such investigations have been found, all using the Bateria de Provas de Raciocínio (BPR-5) to measure mental ability and supervisor evaluations to measure job performance. One is a small study with $n = 57$ from an electric power company, in which no association was found, though the authors noted that this could be due to the sample's educational homogeneity (Baumgartl & Nascimento, 2004). Another is a larger investigation, with $n = 119$ from multiple private companies, that found a positive correlation between intelligence and supervisor evaluations (Pearson's $r = .32$, $p < .01$), even after controlling for multiple potential confounding variables (Cobêro *et al.*, 2006). The third, with $n = 79$ from an electric power company, found a negative correlation between intelligence and workplace accidents (Pearson's $r = -.39$, $p < .05$) among employees with five years of experience or less (Baumgartl & Primi, 2006).

The fact that two of the three Brazilian studies found were able to identify a clear association between intelligence and some relevant aspect of job performance, with the only one not having a similar finding having statistical limitations according to its authors, suggests the possibility that such an association might be as relevant in the country as it is in the United States, Europe, and other developed nations. Nonetheless, this requires further investigation to confirm.

The PAIMT

IQ tests generally have a duration of an hour or more, require a controlled physical environment, and must be administered by a trained psychologist (Anastasi & Urbina, 1997; Mackintosh, 2011), which makes it difficult, costly, and time-consuming to perform research using them, limiting the scope of the studies that can be performed regarding intelligence. However, there are brief tests that have been shown to be reliable, valid, and well-normed, which require only a few minutes to deploy, do not demand specialized settings, and can be administered by non-professionals with minimal training (see Homack & Reynolds, 2007; Kaufman, 2009; Kaufman & Kaufman, 2001; Pierson *et al.*, 2012).

The PAIMT is a one-to-one, face-to-face, brief measure for use in outdoor settings, completed in five minutes or less by non-experts with minimal training. It comprises 15 items from two previous tests (the Knowledge Test and the Academic Thinking Test) and was standardized in 2011 using a sample of 1,254 individuals from 46 municipalities in the state of Pernambuco, Brazil. It was further validated through the analysis of data from 4,201 adults collected between 2011 and 2019, with no evidence of a Flynn Effect. The PAIMT deviation score was found to be a fairly Gaussian and unidimensional construct that is associated with sex, age, income, education, and self-evaluations of intellect as expected from the literature on IQ, constituting a reliable, useful, and practical measure of intelligence for research purposes in the context of Pernambuco, yielding scores ranging from 62 to 137, with a g-factor loading of .25 (Souza *et al.*,

2023). The two tests have been used in multiple studies to assess cognitive ability (Paula & Souza, 2019; Souza & Roazzi, 2017; Souza *et al.*, 2012; Souza *et al.*, 2019; Taissun *et al.*, 2012).

Possible Intervening Variables

Regardless of the individual importance of intelligence as a predictor and a possible causal factor, workplace performance and occupational success are multivariate phenomena involving many other variables.

There is ample evidence that Quality of Working Life (QoWL) is a very relevant factor for individual performance and, ultimately, organizational success, by means of an impact on the motivation to work (Aketch *et al.*, 2012; Efraty & Sirgy, 1990; Rubel & Kee, 2014; Thakur & Sharma, 2019). Other elements pointed to in the literature include leadership qualities (Al-Malki & Juan, 2018; Frieder *et al.*, 2018; Mihalcea, 2014), personality traits (Hogan & Holland, 2003; Hurtz & Donovan, 2000; Salgado, 1997), and training and development (Haryono *et al.*, 2020; Manzoor *et al.*, 2019; Park *et al.*, 2018).

The Digital Revolution that occurred roughly between 1990 and 2010 has brought about new ways of thinking and acting that may be summarized in the concept of hyperculture, which not only is related to intelligence and personality, but also has been shown to be predictive of occupational performance and success (Souza & Rangel, 2015; Souza *et al.*, 2010; Souza *et al.*, 2012; Souza *et al.*, 2019).

Given all the above, one must conclude that QoWL, leadership qualities, personality traits, training and development, and hyperculture should be pondered when assessing the role of intelligence in job performance and occupational success, with the possibility of complex interactions.

Study Goals

The present paper aims to empirically investigate the relationship between psychometric intelligence, job performance, and occupational success in the context of employees with a higher education degree or more, working in public or private companies in the Metropolitan Region of Recife, Pernambuco, Brazil, pondering the eventual effects of QoWL, leadership qualities, personality traits, engagement in training and development, and hyperculture. The hypothesis to be tested is that, in the Brazilian context, IQ is positively associated with workplace outcomes, even after controlling for QoWL, leadership qualities, personality traits, and hyperculture.

Method

Sample

A total of 134 adults from the Metropolitan Region of Recife (RMR), Pernambuco, Brazil, with a higher education degree or higher, were employed in public (48.5%) or private (51.5%) organizations. Participants were selected through non-probabilistic convenience sampling, conducted by trained undergraduate students, who were instructed to approach individuals in public spaces while ensuring minimum heterogeneity in age and educational level. This sampling strategy is appropriate for exploratory studies in applied organizational contexts, and the final sample size (n = 134) meets the recommended ratio of 10–15 cases per predictor in logistic regression models (Peduzzi *et al.*, 1996), ensuring adequate statistical power for the analyses.

The equal proportion of men and women (67 each, with a mean age of 38.2 years [SD = 12.70], ranging from 19.0 to 65.1) resulted from an intentional balancing criterion adopted to avoid sex-related confounding effects in the analyses, rather than from natural population proportions. Approximately 58.2% had a higher education degree, 29.1% had a specialist certificate, and 12.7% had either a master's or a doctorate. Around 38.1% were single, 47.8% married, 9.7% divorced, and 4.5% had a common-law spouse.

Materials

All instruments used in the study were standardized self-report or performance-based measures with documented psychometric properties, including the number of items, scoring procedures, and evidence of reliability and validity appropriate for Brazilian adult populations. This ensured that all variables of interest—cognitive, behavioral, and contextual—were assessed with tools capable of producing consistent and interpretable data. The instruments used include a form containing closed questions regarding the individual's sociodemographics (sex, age, education, marital status, and children), use of time (time spent sleeping, with family, performing physical exercise, and working), and working life (duration of employment, meeting of performance requirements, satisfaction with working life, engagement in training and/or development, position at the company, and the company's segment of activity). Together, these measures provided a broad contextual picture of each participant's daily routines and occupational conditions, allowing the cognitive results to be interpreted within a richer organizational framework.

Intelligence was evaluated through the PAIMT (Souza *et al.*, 2010; Souza *et al.*, 2012; Souza *et al.*, 2023), a 15-item brief intelligence test that can be administered in five minutes or less, validated through a sample of 4,201 adults in the state of Pernambuco, Brazil, with evidence of unidimensionality (Confirmatory Factor Analysis with Steiger-Lind Root-Mean Square Error of Approximation = 0.040 and Adjusted Population Gamma Index = 0.975), Cronbach Alpha score of .77, and reasonable Gaussianity (Skewness = 0.23 and Kurtosis = -0.36). The g-factor loading was 24.5%, and the instrument yielded an IQ score between 62 and 137. Its brevity and strong psychometric indicators made it particularly suitable for field data collection, ensuring a reliable estimate of general cognitive ability without imposing excessive burden on participants.

There was also the Leadership Scale (Souza & Roazzi, 2020), a 10-item self-evaluation form for leadership aptitude validated through a sample of 784 adults in the Metropolitan Region of Recife, Pernambuco, Brazil, with a Cronbach Alpha score of .83, besides a positive correlation to the level of the position one occupies (S= .31, $p < .01$), to the relationship with subordinates (Spearman's rho = .41, $p < .01$), and to job performance (Spearman's rho = .29, $p < .01$). The scale was also shown to have positive associations with the propensity to occupy a leadership position in the company (One-Way ANOVA, $DF = 5$, $F = 11.216$, and $p < .01$) and the propensity to have one's own business (One-Way ANOVA, $DF = 5$, $F = 4.122$, and $p < .01$).

The Hypercultural Index Form is a questionnaire containing 14 items regarding an individual's use and mastery of digital technologies, as well as their engagement with the sociocultural structures created around such technologies, along with the internalization of concepts and representations pertaining to such things (Souza *et al.*, 2010; Souza *et al.*, 2012). It is based on a combination of six subindexes (Hardware, Access, Smartphone, Software, Internet, and Analogies), combined into a single score and normalized to values between 0 and 1, with a Cronbach's alpha of .84.

Personality was assessed using the Ten-Item Personality Inventory (TIPI), a measure of the Big Five personality dimensions (Gosling *et al.*, 2003), which was structurally validated in Brazil with a sample of 1,679 adults (Souza *et al.*, 2015).

Procedures

A total of 35 undergraduate students of Enterprise Management enrolled in People Management 2 at the Federal University of Pernambuco in 2019 recruited the participants from the streets of the Metropolitan Region of Pernambuco as a sample of convenience with equal rates of men and women, ages above or below 30 years, and having or not a higher education degree. Excluding incomplete or erroneous records, a total sample of 263 adults was collected, of whom 134 were included in the present study for having a higher education degree.

Ethics Statement

In accordance with Article 1, sole paragraph, item I, of Resolution No. 510/2016 of the Brazilian National Health Council, research involving anonymous public-opinion data with non-identified participants is not subject to registration or review by the CEP/CONEP system (Conselho Nacional de Saúde, 2016). In the present study, no identifying information was requested or recorded, no experimental intervention was carried out, and the procedures did not involve risks

greater than those ordinarily encountered in daily life. Moreover, no diagnosis, treatment recommendation, or counseling was provided based on participants' responses or any other study-related information. Participation was fully informed and strictly voluntary, and all procedures were conducted in accordance with national and international ethical principles governing research with human participants.

Results

Descriptive Statistics for PAIMT IQ

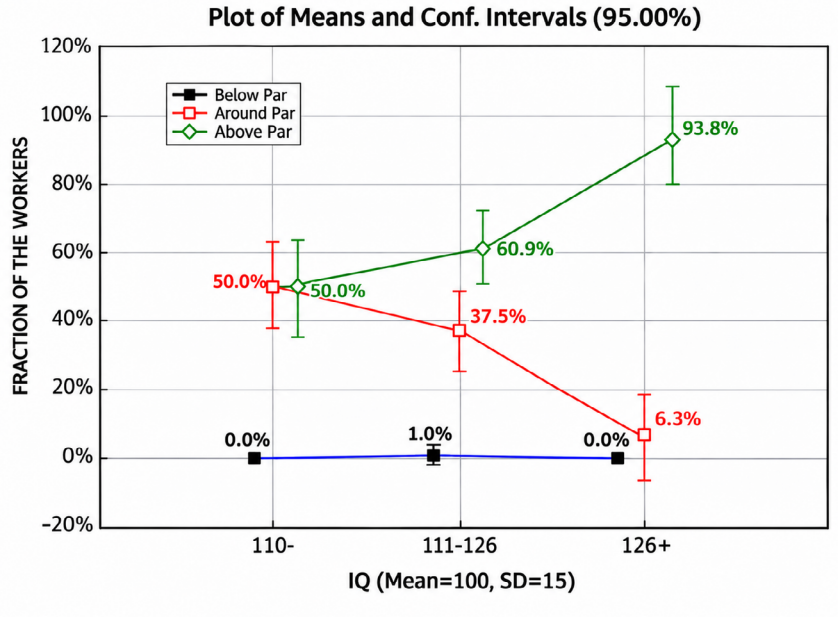
The PAIMT IQ had a mean = 111.3 (*SD* = 11.71), ranging from 81.9 to 137.0, with a Gaussian distribution (Skewness = -0.109, Kurtosis = -0.088, Anderson-Darling p = .24). Approximately 4.5% of the scores were low (76–89), 35.8% middle (90–110), 47.8% high (111–125), and 11.9% gifted-level (126+).

Univariate Association Between IQ and Job Performance

Job performance was self-rated by the participants, according to the standards and expectations of their employers, through a Likert scale ranging from "0" (*Far Below What is Required*) to "4" (*Far Above What is Required*).

There was a positive correlation between IQ and job performance (Spearman's rho = .17, p = .05) in the whole sample. Figure 1 shows the percentage of those responding with a "0" or "1" (Below Par), a "2" (Around Par), and "3" or "4" (Above Par) as a function of IQ range.

Figure 1. Percentages of Those Who Rate Their Job Performance, According to the Requirements of Their Employer, as Above Par, Around Par, and Below Par as a Function of the Level of IQ



The Maximum-Likelihood Chi-square test indicated that a higher IQ range was associated with the fraction of the workers who self-rated their performance as "Above" or "Around" par according to the expectations of the employer ($p < .01$ for both), but not with the percentage judging themselves to be "Below" par ($p = .48$).

Logit Regression of Above-Par Job Performance

Table 1 shows the results of a Backward Stepwise Logit Regression of having or not an Above Par job performance as a function of intelligence, personality, leadership traits, number of hours working in total and at home, satisfaction with job (in general and with salary, tasks, evaluations received, and career prospects), and satisfaction with workplace relations (boss, coworkers, and subordinates). As per the statistical procedure, initially a model is run using all the independent variables in question, then the one with the highest *p*-value for an association with Above Par performance is removed and a second model is run with the remaining independent variables, this process being repeated sequentially, stopping only when reaching a model where all the remaining independent variables have an association with $p < .05$.

Table 1. Results of a Backward Stepwise Logit Regression for Having Above-Par Job Performance

Sensitivity = 82.7%; Specificity = 41.5% Positive Predictive Value = 68.4%; Negative Predictive Value = 61.1% $Chi^2(4) = 19.098$; $p = .01$					
Variable	**Coefficient**	***OR***	**-95%**	**+95%**	***p*-value**
PAIMT IQ	0.039	8.774	1.343	57.335	.02
Conscientiousness	0.553	7.380	1.483	36.717	.01
Neuroticism	0.420	5.652	1.000	32.045	.05
Leadership Traits	0.508	5.141	1.047	25.253	.04
Constant	-3.997				.04

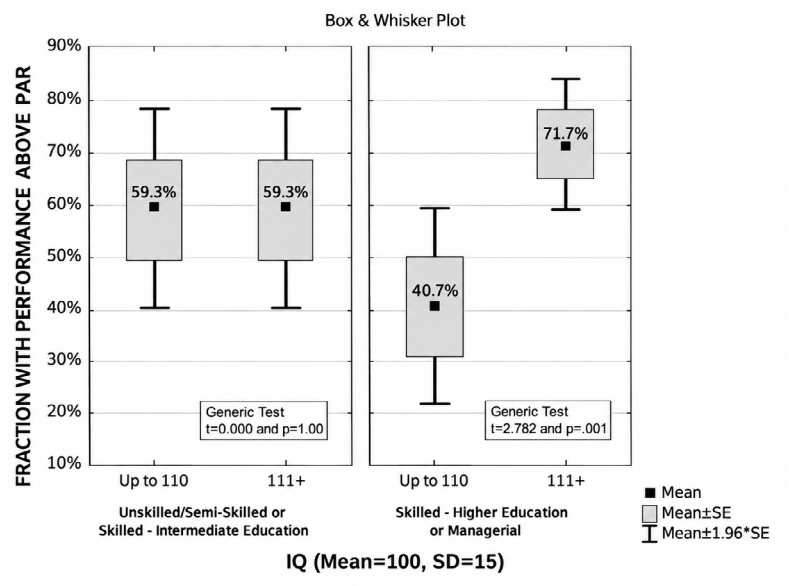
Note. Level of Education, Hyperculture, No. of Hours Spent Working, No. of Hours Working From Home, Satisfaction With Job, Satisfaction With Workplace Relations, Openness to Experience, Agreeableness, and Extraversion were also included in the analysis, but excluded from the final result by the Stepwise Procedure.

Only four of the 13 variables included in the analysis emerged as statistically significant predictors in the Stepwise model (PAIMT IQ, Conscientiousness, Neuroticism, and Leadership Traits), with PAIMT IQ showing the strongest association. These values suggest that each predictor substantially increases the likelihood of reporting above-par performance, with intelligence showing the most pronounced effect even when all other variables are considered simultaneously.

Above-Par Job Performance and IQ According to the Position in the Company

Figure 2 shows the percentage of those rating their performance as Above Par as a function of IQ level (110- vs. 111+) and position level within the company (Unskilled/Semi-Skilled or Skilled – Intermediate Education vs. Skilled – Higher Education or Managerial).

Figure 2. Percentage of Those With Performance Above Par as a Function of IQ and Position in the Company



The probability of surpassing the employing company's performance requirements was higher among the more intelligent, but only for those in the upper positions in their organizations.

Position and Income Versus Duration of Employment According to IQ Range

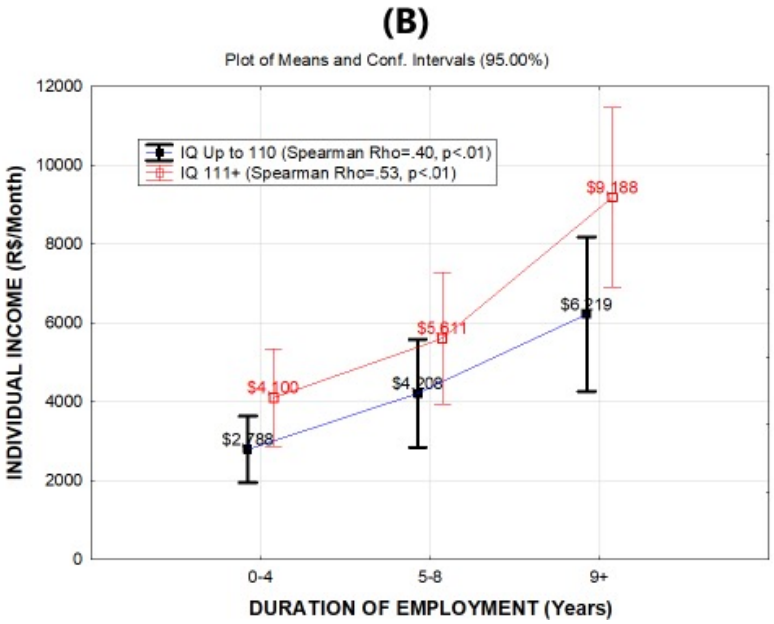
Figure 3 shows the association between duration of employment and job position, as well as with personal income, for those with intermediate or higher levels of intelligence.

It is clear that position in the company increases over time for those with an IQ of 111 or higher, but not for those with lower IQs. Monthly individual income showed a positive association with duration of employment at both intelligence levels; however, the association was stronger for those with an IQ of 111+ (Coefficient of Determination of 28% vs. 16%).

Figure 3. Position in the Company (A) and Individual Income (B) Versus Duration of Employment According to IQ Range

(A)





Discussion

Confirmation of the Literature

In the present study, IQ was found to be positively associated with job performance as self-rated by workers, in line with employer requirements. The degree of the ordinal correlation found was on the lower end (rho = .17); however, it translated into a substantially higher chance of an Above Par performance, especially among those with an IQ of 126+, where the probability jumps from 50.0% to 93.8%.

The results in question seems to confirm most of the Brazilian and international literature on the subject of the association between intelligence and job performance (Anastasi & Urbina, 1997; Eysenck, 1998; Firkowska-Mankiewicz, 2011; Ganuthula & Sinha, 2019; Hermstein & Murray, 1994; Hunt, 2011; Jensen, 1982; Lynn & Vanhanen, 2012; Meisenberg, 2012; Neisser *et al.*, 1996; Scullin *et al.*, 2000; Sternberg *et al.*, 2001) and also those of the two largest Brazilian studies one could find (Baumgartl & Primi, 2006; Cobêro *et al.*, 2006). This includes the robustness of an effect observable despite a relatively small sample size, the use of a nonparametric coefficient, a somewhat subjective assessment of performance, and the use of a brief IQ measure rather than a more comprehensive instrument. It also confirms that such brief instruments can be reasonably accurate and useful, at least for research purposes (see Homack & Reynolds, 2007; Kaufman & Kaufman, 2001; Pierson *et al.*, 2012), particularly the PAIMT IQ (Souza *et al.*, 2023).

Furthermore, the present findings align with recent evidence showing that cognitive ability remains one of the most robust predictors of workplace effectiveness across occupational levels and cultural contexts (Bertua *et al.*, 2022; Hambrick *et al.*, 2024; Salgado & Moscoso, 2019). They also converge with contemporary models of job performance that emphasize the combined influence of cognitive resources, personality traits, and contextual factors (Judge *et al.*, 2003), reinforcing the multidimensional yet central role of intelligence in organizational behavior.

Controlling for Confounding Factors

A Logit Regression found that not only did IQ show a clear positive association with job performance, even after controlling for a wide variety of confounding factors, but it also emerged as the variable with the strongest independent association. Indeed, in the analysis, those in the highest range of the test used had an 8.7-fold greater chance of reporting an Above Par performance than those at the lower end of the same test. The

Backward Stepwise procedure may discard variables involved in the mechanisms and processes underlying performance, but in doing so, it identifies the best and most independent predictors, among which intelligence emerged as the strongest.

In addition to further corroborating the literature on the relationship between intelligence and job performance, as previously indicated, these findings directly contradict the proposal by Byington and Felps (2010) that the IQ advantage would be merely a self-fulfilling prophecy due to greater access to developmental resources such as education and training. A substantial positive association was observed between intelligence and job performance, even after controlling for both and for multiple other variables, such as amount of work, leadership qualities, personality traits, and hyperculture. This suggests a per se effect of IQ on job performance due to actual abilities in problem-solving and learning, even if other, more indirect, advantages might exist.

Meaningfulness

The association between IQ and job performance was stronger for those in higher-level, more senior positions within the company. This is consistent with intelligence having a greater impact on the performance of more complex tasks, as one would expect given both the nature of the construct and the existing evidence as to how it associates with multiple aspects of life (Anastasi & Urbina, 1997; Hermstein & Murray, 1994; Kaufman, 2009; Lynn & Vanhanen, 2012; Mackintosh, 2011; Neisser *et al.*, 1996).

In the present study, the finding of a stronger association between duration of employment and both the position occupied and individual income, as a function of higher IQ, suggests that the intelligence being measured translates into something relevant enough to eventually be rewarded by the employer. This pattern suggests that cognitive ability contributes not only to day-to-day performance but also to longer-term professional advancement, reinforcing its practical relevance in organizational settings. Since this is the result of a cross-sectional analysis rather than a longitudinal study, one is limited in the extent to which these findings can be used to infer developmental trajectories over time. Even so, the consistency of the observed associations aligns with the broader notion that intelligence supports workplace success by enhancing learning, problem-solving, and overall behavioral effectiveness—effects that remain significant even after accounting for workload, education, and other contextual variables.

Taken together, the findings that intelligence is more relevant to performance in higher-level positions and that it is associated with greater occupational progress over time indicate that the ability being measured is of genuine relevance and meaning in the workplace. They also provide indirect support for the validity of self-reported job performance, which appears to function as a reasonable proxy for actual work quality and productivity within this sample.

Limitations

There are some limitations of the present study that must be acknowledged. First, the sample size is small and drawn entirely from the Metropolitan Region of Recife, which warrants caution when generalizing the findings. Second, the study is cross-sectional, so it cannot claim that the relationships observed are causal, despite efforts to indirectly control for time and confounding variables. Third, the reliance on self-reported job performance may introduce a subjective bias that, although mitigated by the associations observed with position and earnings, cannot be entirely ruled out. These caveats must be carefully considered when interpreting what is presented in this paper.

Conclusions

The present study aimed to investigate the impact of intelligence on workplace performance among workers with higher education in Brazil. For that purpose, a total of 134 participants from the Municipal Region of Recife, Pernambuco, were investigated using the PAIMT IQ as a measure of intelligence and self-reported performance

relative to what is required by the employer, along with instruments assessing sociodemographics, personality, leadership, hyperculture, use of time, and various aspects of workplace life.

In spite of the limitations of using brief instruments, subjective self-evaluations, a cross-sectional analysis, and a relatively small sample size, the results obtained were strongly indicative that, in confirmation of the larger portion of the Brazilian and international literature, intelligence does have a significant and substantial positive impact on job performance, more so than many other variables, even when controlling for multiple factors, with relevant implications for career trajectory, particularly for those in higher positions and, presumably, more complex tasks. It is also an indication of the scientific value of using brief measures of psychological traits.

We conclude that intelligence is likely one of the most important variables to consider in people management, with clear implications for performance management, personnel selection, and career counseling. From a professional standpoint, this underscores the value of incorporating validated cognitive measures into personnel selection, training allocation, and career development processes, particularly in roles that demand rapid learning, complex reasoning, and sustained problem-solving. Furthermore, integrating objective performance indicators and broader cognitive batteries in future research may deepen our understanding of how intelligence interacts with organizational demands, offering a more complete picture of its role in workplace effectiveness. Therefore, it is recommended that more studies be conducted on this topic to overcome its limitations and further clarify the role of intelligence in the workplace.

References

Aketch, J. R., Odera, O., Chepkuto, P., & Okaka, O. (2012). Effects of quality of work life on job performance: Theoretical perspectives and literature review. *Current Research Journal of Social Sciences*, *4*(5), 383–388.

Al-Malki, M., & Juan, W. (2018). Leadership styles and job performance: A literature review. *Journal of International Business Research and Marketing*, *3*(3), 40–49. https://doi.org/10.18775/jibrm.1849-8558.2015.33.3004

Alves, I. C. B., Rosa, H. R., Silva, M. A., & Sardinha, L. S. (2016). Avaliação da inteligência: revisão de literatura de 2005 a 2014. *Avaliação Psicológica*, *15*(spe), 89–97. https://pepsic.scielo.org/pdf/avp/v15nspe/v15nspea10.pdf

Anastasi, A., & Urbina, S. (1997). *Psychological testing* (7th ed.). Prentice Hall.

Baumgartl, V. O., & Nascimento, E. (2004). A Bateria de Provas de Raciocínio (BPR-5) aplicada a um contexto organizacional. *Psico-USF*, *9*(1), 1–10. https://doi.org/10.1590/S1413-82712004000100002

Baumgartl, V. O., & Primi, R. (2006). Evidências de validade da bateria de provas de raciocínio (BPR-5) para seleção de pessoal. *Psicologia: Reflexão e Crítica*, *19*(2), 246–251. https://doi.org/10.1590/S0102-79722006000200010

Bertua, C., Anderson, N., & Salgado, J. F. (2022). The predictive validity of cognitive ability tests: A UK meta-analysis. *Journal of Occupational and Organizational Psychology*, *78*(3), 387–409. https://doi.org/10.1348/096317905X26994

Borsboom, D. (2006). The attack of the psychometricians. *Psychometrika*, *71*(3), 425–440. https://doi.org/10.1007/s11336-006-1447-6

Byington, E., & Felps, W. (2010). Why do IQ scores predict job performance? An alternative, sociological explanation. *Research in Organizational Behavior*, *30*, 175–202. https://doi.org/10.1016/j.riob.2010.08.003

Campos, C. R., & Nakano, T. C. (2012). Produção científica sobre avaliação da inteligência: o estado da arte. *Interação Psicológica*, *16*(2), 271–282. https://doi.org/10.5380/psi.v16i2.22619

Cobêro, C., Primi, R., & Muniz, M. (2006). Inteligência emocional e desempenho no trabalho: um estudo com o MSCEIT, BPR-5 e 16PF. *Paidéia*, *16*(35), 337–348. https://doi.org/10.1590/S0103-863X2006000300005

Conselho Nacional de Saúde. (2016). *Resolução nº 510, de 7 de abril de 2016. Ministério da Saúde*. Diário Oficial da União, nº 98, Seção 1, 44–46.

Cronshaw, S. F., Hamilton, L. K., Onyura, B. R., & Winston, A. S. (2006). Case for non-biased intelligence testing against black Africans has not been made: A comment on Rushton, Skuy, and Bons (2004). *International Journal of Selection and Assessment*, *14*(3), 278–287. https://doi.org/10.1111/j.1468-2389.2006.00346.x

Efraty, D., & Sirgy, M. J. (1990). The effects of quality of working life (QWL) on employee behavioral responses. *Social Indicators Research*, *22*, 31–47. https://doi.org/10.1007/BF00286389

Eysenck, H. J. (1998). *Intelligence: A new look*. Transaction Publishers.

Firkowska-Mankiewicz, A. (2011). Adult careers: Does childhood IQ predict later life outcome? *Journal of Policy and Practice in Intellectual Disabilities*, *8*(1), 1–9. https://doi.org/10.1111/j.1741-1130.2011.00281.x

Frieder, R. E., Wang, G., & Oh, I.-S. (2018). Linking job-relevant personality traits, transformational leadership, and job performance via perceived meaningfulness at work: A moderated mediation model. *Journal of Applied Psychology*, *103*(3), 324–333. https://doi.org/10.1037/apl0000274

Ganuthula, V., & Sinha, S. (2019). The looking glass for intelligence quotient tests: The interplay of motivation, cognitive functioning, and affect. *Frontiers in Psychology*, *10*, 2857. https://doi.org/10.3389/fpsyg.2019.02857

Gosling, S. D., Rentfrow, P. J., & Swann Jr., W. B. (2003). A very brief measure of the big-five personality domains. *Journal of Research in Personality, 37*(6), 504–528. https://doi.org/10.1016/S0092-6566(03)00046-1

Gould, S. J. (1981). *The mismeasure of man*. *W. W*. Norton & Company.

Hambrick, D. Z., Burgoyne, A. P., & Oswald, F. L. (2024). The validity of general cognitive ability predicting job-specific performance is stable across different levels of job experience. *Journal of Applied Psychology, 109*(3), 437–455. https://doi.org/10.1037/apl0001150

Haryono, S., Supardi, S., & Udin, U. (2020). The effect of training and job promotion on work motivation and its implications on job performance: Evidence from Indonesia. *Management Science Letters, 10*(9), 2107–2112. https://doi.org/10.5267/j.msl.2020.1.019

Hermstein, R., & Murray, C. (1994). *The Bell curve: Intelligence and class structure in American life*. Free Press.

Hogan, J., & Holland, B. (2003). Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *Journal of Applied Psychology, 88*(1), 100–112. https://doi.org/10.1037/0021-9010.88.1.100

Homack, S. R., & Reynolds, C. R. (2007). *Essentials of Assessment with Brief Intelligence Tests*. Wiley.

Hunt, E. (2011). *Human intelligence*. Cambridge University Press.

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The Big Five revisited. *Journal of Applied Psychology, 85*(6), 869–879. https://doi.org/10.1037/0021-9010.85.6.869

Jensen, A. R. (1982). The debunking of scientific fossils and straw persons. *Contemporary Education Review, 1*(2), 121–135.

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The Core Self-Evaluations Scale: Development of a measure. *Personnel Psychology, 56*(2), 303–331. https://doi.org/10.1111/j.1744-6570.2003.tb00152.x

Kaufman, A. S. (2009). *IQ testing 101*. Springer Publishing.

Kaufman, J. C., & Kaufman, A. S. (2001). Time for the changing of the guard: A farewell to short forms of intelligence tests. *Journal of Psychoeducational Assessment, 19*(3), 245–267. https://doi.org/10.1177/073428290101900305

Lynn, R., & Vanhanen, T. (2012). *Intelligence: A unifying construct for the social sciences*. Ulster Institute for Social Research.

Mackintosh, N. J. (2011). *IQ and human intelligence* (2nd ed.). Oxford University Press.

Manzoor, F., Wei, L., Bányai, T., Nurunnabi, M., & Subhan, Q. A. (2019). An examination of sustainable HRM practices on job performance: An application of training as a moderator. *Sustainability, 11*(8), 2263. https://doi.org/10.3390/su11082263

Meisenberg, G. (2012). National IQ and economic outcomes. *Personality and Individual Differences, 53*(2), 103–107. https://doi.org/10.1016/j.paid.2011.06.022

Mihalcea, A. (2014). Leadership, personality, job satisfaction and job performance. *Procedia - Social and Behavioral Sciences, 127*, 443–447. https://doi.org/10.1016/j.sbspro.2014.03.287

Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., Halpern, D. F., Loehlin, J. C., Perloff, R., Sternberg, R. J., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist, 51*(2), 77–101. https://doi.org/10.1037/0003-066X.51.2.77

Noronha, A. P. P., Freitas, F. A., & Ottati, F. (2002). Parâmetros psicométricos de testes de inteligência. *Interação*

em Psicologia, *6*(2), 195–201. https://doi.org/10.1590/S1413-73722003000100012

Noronha, A. P. P., Primi, R., & Alchieri, J. C. (2004). Parâmetros psicométricos: uma análise de testes psicológicos comercializados no Brasil. *Psicologia: Ciência e Profissão, 24*(4), 88–99. https://doi.org/10.1590/S1414-98932004000400011

Noronha, A. P. P., Vendramini, C. M. D., Canguçu, C., Souza, C. V. R., Cobêro, C., Paula, L. M., Franco, M. O., Lima, O. M. P., Guerra, P. B. C., & Filizatti, R. (2003). Propriedades psicométricas apresentadas em manuais de testes de inteligência. *Psicologia em Estudo, 8*(1), 93–99. https://doi.org/10.1590/S1413-73722003000100012

Park, S., Kang, H.-S., & Kim, E.-J. (2018). The role of supervisor support on employees' training and job performance: an empirical study. *European Journal of Training and Development, 42*(1/2), 57–74. https://doi.org/10.1108/EJTD-06-2017-0054

Paula, S. L., & Souza, B. C. (2019). Recurso informacional de jogadores de videogame. *Brazilian Journal of Information Science, 13*(1), 21–32. https://doi.org/10.36311/1981-1640.2019.v13n1.04.p21

Peduzzi, P., Concato, J., Kemper, E., Holford, T. R., & Feinstein, A. R. (1996). A simulation study of the number of events per variable in logistic regression analysis. *Journal of Clinical Epidemiology, 49*(12), 1373–1379. https://doi.org/10.1016/s0895-4356(96)00236-3

Pierson, E. E., Kilmer, L. M., Rothlisberg, B. A., & McIntosh, D. E. (2012). Use of brief intelligence tests in the identification of giftedness. *Journal of Psychoeducational Assessment, 30*(1), 10–24. https://doi.org/10.1177/0734282911428193

Primi, R. (2010). Avaliação psicológica no Brasil: fundamentos, situação atual e direções para o futuro. *Psicologia: Teoria e Pesquisa, 26*, 25–35. https://doi.org/10.1590/S0102-37722010000500003

Reppold, C. T., Serafini, A. J., Gurgel, L. G., & Kaiser, V. (2017). Avaliação de aspectos cognitivos em adultos: análise de manuais de instrumentos aprovados. *Avaliação Psicológica, 16*(2), 137–144. https://doi.org/10.15689/AP.2017.1602.03

Richardson, K., & Norgate, S. H. (2015). Does IQ really predict job performance? *Applied Developmental Science, 19*(3), 153–169. https://doi.org/10.1080/10888691.2014.983635

Righetto, G., Steinmeier, M., & Andrade, R. (2012). Testes de inteligência mantêm popularidade, apesar das controvérsias. *ComCiência, 144*.

Rubel, M. R. B., & Kee, D. M. H. (2014). Quality of work life and employee performance: Antecedent and outcome of job satisfaction in partial least square (PLS). *World Applied Sciences Journal, 31*(4), 456–467.

Salgado, J. F. (1997). The five-factor model of personality and job performance in the European Community. *Journal of Applied Psychology, 82*(1), 30–43. https://doi.org/10.1037/0021-9010.82.1.30

Salgado, J. F., & Moscoso, S. (2019). Meta-analysis of the validity of general mental ability for five performance criteria: Hunter and Hunter (1984) revisited. *Front Psychology, 10*, 2227. https://doi.org/10.3389/fpsyg.2019.02227

Schönemann, P. H. (1997). On models and muddles of heritability. *Genetica, 99*(2-3), 97–108. https://doi.org/10.1023/A:1018358504373

Scullin, M. K., Peters, E., Williams, W. M., & Ceci, S. J. (2000). The role of IQ and education in predicting later labor market outcomes: Implications for affirmative action. *Psychology, Public Policy, and Law, 6*(1), 63–89. https://doi.org/10.1037/1076-8971.6.1.63

Silva, J. A., Ribeiro-Filho, N. P., & Santos, R. C. (2012). Inteligência humana e suas implicações. *Temas em Psicologia, 20*(1), 155–187.

Souza, B. C., & Rangel, J. F. L. B. Jr. (2015). Speed of processing and creativity in the digital age. *Business Creativity and the Creative Economy, 1*(1), 13–21. https://doi.org/10.18536/bcce.2015.07.1.1.03

Souza, B. C., & Roazzi, A. (2017). What is your faction? Multidimensional evidence for the divergent series as the basis for a new model of personality and work life. *Frontiers in Psychology, 8*, Article 1751. https://doi.org/10.3389/fpsyg.2017.01751

Souza, B. C., & Roazzi, A. (2020). Desigualdade de renda entre homens e mulheres: uma visão mais ampla incluindo escolhas, satisfação e percepção de capacidade. *Revista EDUCAmazônia - Educação, Sociedade e Meio Ambiente, 24*(1), 287–313.

Souza, B. C., De Lima e Silva, L. X., & Roazzi, A. (2010). MMORPGS and cognitive performance: A study with 1280 Brazilian high school students. *Computers in Human Behavior, 26*, 1564–1573. https://doi.org/10.1016/j.chb.2010.06.001

Souza, B. C., Roazzi, A., & Neto, A. S. A. (2023). How to easily construct a very brief practical measure of IQ: The Pernambuco Adult Intelligence Mini Test. *Revista AMAzônica*, *16*(2), 345–378.

Souza, B. C., Roazzi, A., Rodrigues, J., & Paula, S. L. (2019). Commercial videogames and their potential for higher education: A study with 347 Brazilian undergraduate business management students. *Acta Scientiae, 21*(1), 116–138. https://doi.org/10.17648/acta.scientiae.v21iss1id4936

Souza, B. C., Souza, F. M. C., Roazzi, A., & Lula, A. M. (2015). The lack of a treatment of uncertainty in facet theory: A relevant problem? In A. Roazzi, B. C. de Souza, & W. Bilsky (Eds.), *Facet theory: Searching for structure in complex social, cultural and psychological phenomena* (pp. 54–64). Editora UFPE. https://doi.org/10.13140/RG.2.1.2129.7682

Souza, B. C., Silva, A. S., Silva, A. M., Roazzi, A., & Carrilho, S. L. S. (2012). Putting the Cognitive Mediation Networks Theory to the test: Evaluation of a framework for understanding the digital age. *Computers in Human Behavior, 28*(6), 2320–2330. https://doi.org/10.1016/j.chb.2012.07.002

Sternberg, R. J., & Wagner, R. K. (1993). The g-ocentric view of intelligence and job performance is wrong. *Current Directions in Psychological Science, 2*(1), 1–5. https://doi.org/10.1111/1467-8721.ep10770441

Sternberg, R. J., Grigorenko, E. L., & Bundy, D. (2001). The predictive value of IQ. *Merrill-Palmer Quarterly, 47*(1), 1–41. https://doi.org/10.1353/mpq.2001.0005

Taissun, A. S., Souza, M. G. T. C., Silva, E. S., & Souza, B. C. (2012). Explorando os elementos psicossociais da criminologia do homicídio no Nordeste: um estudo empírico. *Rios Eletrônica (FASETE), 6*, 105–119. https://www.unirios.edu.br/revistarios/media/revistas/2012/6/explorando_os_elementos_psicossociais_da_criminologia_do_homicidio_no_nordeste.pdf

Thakur, R., & Sharma, D. (2019). A study of impact of quality of work life on work performance. *Management and Labour Studies, 44*(3), 326–344. https://doi.org/10.1177/0258042X19851912

Vendramini, C. M. M., & Lopes, F. L. (2008). Leitura de manuais de testes psicológicos por estudantes e profissionais de psicologia. *Avaliação Psicológica*, *7*(1), 93–105. http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1677-04712008000100012

Wechsler, S. M., Hutz, C. S., & Primi, R. (2019). O desenvolvimento da avaliação psicológica no Brasil: Avanços históricos e desafios. *Avaliação Psicológica*, *18*(2), 121–128. https://doi.org/10.15689/ap.2019.1802.15466.02