Newer Concepts of Intelligence: Their Practical and Legal Implications for Employee Selection

Gerald V. Barrett, Alissa J. Kramen, Sarah B. Lueke
Barrett & Associates, 500 W. Exchange St., Akron, OH 44302
gbarrett@barrett-associates.com

Over the last 30 years there have been repeated attempts to improve upon our basic theories of intellectual abilities and the accompanying tests. These include such concepts as emotional intelligence (Goleman, 1998; Mayer, DiPaolo, & Salovey, 1990), tacit knowledge (Sternberg, 1985), practical intelligence (Sternberg & Wagner, 1986), competencies (McClelland, 1973), and multiple intelligences (Gardner, 1983). The purpose of this paper is to critically examine these concepts for their practical and legal significance for employee selection systems in the public and private sectors. In a review of existing professional literature, we have concluded that these "novel" concepts have neither practical nor legal significance. It is our belief that these theories and concepts have been poorly developed, poorly measured, and have yet to result in selection tests with any practical significance. There is no evidence that these variations of intelligence provide any incremental validity over cognitive ability tests in predicting job performance, nor is there evidence that adverse impact on minority applicants is reduced. Tests designed to measure these variations of intelligence fail to meet requirements of the professional standards (APA, 1999), professional principles (SIOP, 1987), and legal guidelines (EEOC, 1978, 1979, 1980) for employee selection tests. It is our conclusion that these so called novel concepts detract from legitimate theories of intelligence and the development of constructs and operational tests which will provide more effective employee selection tools and meet prevailing legal challenges.

Why Ignore the g Factor? -- Historical Considerations

Christopher R. Brand
Edinburgh Research Consultant to the Woodhill Foundation (USA), 71, South Clerk Street; Gamblers' Corner; Edinburgh, UK
Denis Constales
University of Ghent Postdoctoral Scientific Researcher, Department of Mathematical Analysis, Ghent University, Galglaan 2; B9000 Gent, Belgium
and Harrison Kane
University of Nevada, Psychologist, Exceptional Student Education, Putnam County School District, Florida, USA
brand@crispian.demon.co.uk

Today's neglect of general intelligence (g) and IQ by psychologists, educationists and the media is the West's version of Lysenkoism. By 2000, hysterical denial of g became effectively the official science policy of the USA as Stephen Jay Gould, the author of The Mismeasure of Man -- and thus Arthur Jensen's main rival -- was elected President of the American Association for the Advancement of Science. Rooted in an egalitarian ideology that the West had managed to expel from the field of economic policy in the Reagan/Thatcher years, denial of g has typically been supported by wilful ignorance, wishful thinking and downright censoriousness.

Those who deplore g and its links to heredity, achievement and race often rehearse the multifactorial/componential ambitions of the nineteenth–century phrenologists that eventually appealed to American psychologists in the 1930's and subsequently. Alternatively, g-denial may deploy both ancient and modern arguments that nothing can be 'measured' in psychology. These two contradictory positions of IQ's more scholarly detractors are especially considered in this chapter, as is the less-often-remarked problem for the London School that so few Christian-era philosophers and psychologists -- prior to Herbert Spencer and Sir Francis Galton -- made much room in their systems for g.

Despite considerable tacit acceptance of Plato's stress on the centrality of reason in human psychology, Plato's elitism and eugenicism are feared for their supposedly authoritarian implications; thus his acknowledgment that people have different general mental potentials is set aside. However, a hypothesis is advanced here, and supported empirically, which attributes neglect of g by intellectuals partly to their limited experience of real life – across the full IQ range. Data from 6,539 representative American subjects are searched to form groups having mean IQs 115 and 85 respectively, and it is found that the g factor accounts for almost twice as much mental ability variance among subjects in the lower-IQ group. After a decade of argument about H. E. Garrett's suggestion that intelligence 'differentiates' at higher levels of g, the present data arguably provide a decisive result – especially taking account of Jensen's criticisms of previous 'differentiation' findings and using well separated IQ ranges. Finally, it is suggested that, far from needing to be feared, Platonic realism actually enjoys distinguished support in modern philosophy and provides a basis for a new liberalism.

Invited for publication in a Festschrift for Arthur Jensen, to be published ?2002 by Pergamon Press (ed. H. Nyborg).

Exploring the Validity of Three Idea Production Tests

Christopher A. Condon and David H. Schroeder
Johnson O'Connor Research Foundation,161 E. Erie St., Suite 304, Chicago, IL 60611
Ccondon17@aol.com

In this study, we assessed the validity of three idea- production tests. Idea production is fundamental to such endeavors as invention, teaching, and sales. The idea- production test currently used in our testing program is written Ideaphoria (ID) and is measured by summing the number of words written to a fanciful question. ID is highly correlated with writing speed, as evidenced by correlations ranging from .52 to .65 (Daniel, 1980, 1982). Two alternative measures of idea production, Oral Ideaphoria (OI) and Idea Fluency (IF), were developed with the intention of maximizing idea-production variance and minimizing speed and other extraneous variance. OI is similar to ID except words are spoken, and IF is similar to ID except examinees make a list of responses rather than writing a narrative. In addition to the idea-production tests, verbal fluency, writing and talking speed, and a criterion measure of creative achievement were also assessed. Convergent validity was fairly evident, as the idea-production tests correlated relatively highly with one another. But, the relationship between the idea-production tests and the criterion measure was not very strong. Discriminant validity was not fully demonstrated, as the idea-production tests correlated moderately with the verbal fluency and speed tests. IF is significantly more related to the criterion measure and less related to writing speed than is ID. It may be the case that employing an idea-production test that uses a more succinct, terse response by examinees, in the manner of IF, leads to a more-valid idea-production measure. Future research should be directed toward alternative measures and scoring procedures for idea production.

A Systems Approach to Creative Intelligence

Koen DePryck
Chair – Institute of Knowledge Management, Dilbeek (Belgium)
KDP@KDPgroup.com

In this paper, I develop a notion of (human) creative intelligence in the context of a general (evolutionary) systems theory, the study of principles applying to non-deterministic dynamical systems in general and to human cognition in particular.

I argue that the complexity and interdependence of human cognitive operations and their interaction with the environment is such that there is hardly ever a single deterministic outcome of a cognitive process. Quite often we are dealing with NP-complete problems, any of a class of computational problems for which no efficient solution algorithm has (yet) been found. Nevertheless, we, as human beings, and some of us more than others, are capable of finding solutions to novel challenges without having to resort to a time-consuming trial-and-error strategy. At the very least we seem to be able to restrict the amount of trial-and-error we need to do by starting off with better than statistical initial guesses.

Any attempt to categorize creative intelligence in terms of human actions is bound to end up in the neighborhood of problem solving. Creative intelligence, I suggest, is the generic systemic operation that allows a complex system to generate an outcome or a next state that, in the absence of a deterministic procedure to solve a problem, is better than a random next step. Creative intelligence, as a process, increases the probability of finding solutions to (real or imagined) problems. Once a solution has been found, it becomes easier to establish optimized versions that can be transmitted through cultural learning processes.

Case studies indicate over and over again that some of the most valued human accomplishments and insights were inspired by works of art or were first proposed by dyslexics struggling with words and the reality behind them. Once ‘available’ and culturally transmitted, these insights appear natural and easy. Precisely because artists and dyslexics represent marginal groups, the output of their cognitive processes is rare and thus valuable: Depending on their other qualities, they contribute to the cognitive variation required to survive as a species in a complex and changing environment.

In the artistic process, both the well-defined initial problem and the predefined solution are prominently absent. In that (somewhat Kantian) sense, artistic creativity appears as the unconstrained application of our problem solving abilities—free from constraints imposed by pre-set conditions on either what would constitute a problem or a solution or on how a solution should be obtained.

In many cases of learning difficulties, we find not only problems related to specific skills (e.g., reading) but also ‘different’ thought processes: either more attention to detail or more global perception, a different use of language and meaning, etc. Working with dyslexics, one often experiences that they have a different perspective on things. Obviously, given the genetic basis for several of these problems, their evolutionary advantage must be looked for in these ‘older’

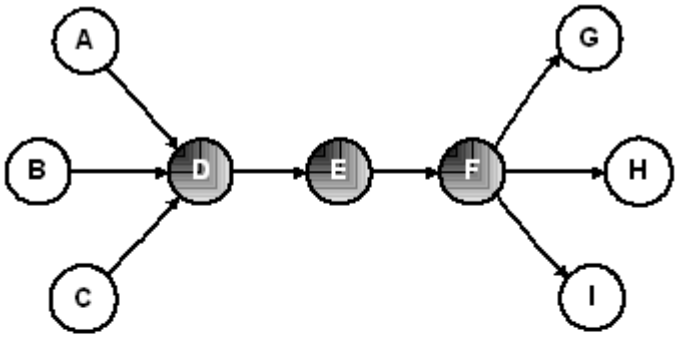
positive skills and not in their struggle with recent skills such as reading and writing, skills for which no specific genetic drive can yet exist.

Summarizing, I argue that marginal cognitive strategies are essential to the continued existence of the species. Their social cost is largely compensated by their potential benefit.

Simulation of a System Theory of Intelligence: Critical Issues

Douglas K. Detterman, Elijah Petersen, and Meredith Frey
Case Western Reserve University, Cleveland, OH
dkd2@po.cwru.edu

Detterman has proposed a theory of g based on system operation. According to this theory, g is the result of deficits in a central process that lowers the operational efficiency of the entire system. We have developed a method for simulating such a model of a system to see if the theory proposed is capable of accounting for empirical findings surrounding general intelligence. There are a number of findings that any theory of g should be able to account for, including the following questions: 1) Why do mental tests correlate with each other? 2) Why do less complex tests have lower correlations with g than more complex tests? 3) Why are correlations higher for low IQ persons than they are for high IQ persons? 4) Why are we unable to diagnose specific deficits using cognitive tests? We used a very simple models (similar to the one shown below) that included input and output processes as well as central processes. Each of these processes was then randomly assigned a normal deviate value for each process for each subject. Cognitive



Three Central Processes

Basic Processes:
A, B, C, . . ., I

Cognitive Processes:
ADEFG, ADEFH, ADEFI, BDEFG, . . .
,CDEFI

tests were then constructed by tracing routes through the model and, consistent with the theory proposed by Detterman, assuming that the poorest process determined the overall performance for that path. IQ scores were simulated by summing the individual cognitive tasks obtained from this model. These simulations show how each of the above questions can be answered.

Intelligence and Memory Performance in an Recognition Paradigm; an EEG-Wavelet-Analysis

M. Doppelmayr, W. Gruber, W. Klimesch, D. Pöllhuber, and S. Weber
University of Salzburg, Dep. of Physiological Psychology, Hellbrunnerstr. 34 5020 Salzburg, AUSTRIA
michael.doppelmayr@sbg.ac.at

Although there is an increasing amount of studies addressing the relationship between cognitive performance and the human EEG the exact influence of intelligence is still unclear. Besides studies investigating ERPs (Jausovec N. & Jausovec K.; Biolog. Psych. 2000), ERD (Neubauer et al., Intellig. 1995) or the dynamic complexity of the EEG (Lutzenberger W., et al; Neurosci. Letters, 1992) most studies deal either with EEG power (Jausovec N.; Intellig., 1996; Klimesch et al., Intellig. 2000; Doppelmayr et al., Intellig. in press) or alpha frequency (Anokhin A. & Vogel F.; Intellig., 1996).

In this study we investigated the influence of intelligence and memory performance on event-related band power changes in different frequency bands. 26 voluntary subjects participated in this study. EEG was recorded during a study and a recognition session. In the first part of the experiment the subjects were asked to look at consecutively presented pictures and to keep these in mind. During the recognition phase they had to decide whether a picture has previously been presented or not. Additionally intelligence was tested by the means of the IST 70 (Intelligenz-Struktur-Test 70; Amthauer R. 1970).

The EEG data of correct answers (during learning and recognition) have been analyzed using wavelet-analysis (Meyer Wavelet). The respective wavelet-coefficients have been transformed according to the ERD% method (Pfurtscheller G, & Aranibar A., Electroenc. Clin. Neurophysiol., 1977).

In accordance with the findings of Klimesch (Klimesch W., Brain Res. Rev., 1999) the results show generally a band power increase of the slower frequency bands (theta) in response to the stimulus and a band power decrease for the faster frequency bands (alpha bands). In a next step the values for band power in- or decrease have been correlated with the respective intelligence and memory scores. While memory performance correlates positively with band power increase in the delta and theta frequency range during the study phase, intelligence shows negative correlations in these frequencies during the recognition task. Although the role of the delta band, with respect to cognitive performance is unclear, the results of the theta frequency band can be interpreted according to the neural efficiency hypothesis.

Equal Opportunity and Racial Differences in IQ: Further Evidence

Joseph F. Fagan
Case Western Reserve University, Cleveland, OH
and Cynthia R. Holland
Cuyahoga Community College, Cleveland, OH
jff@po.cwru.edu

In a recent series of three experiments, we found that differences in knowledge between Blacks and Whites for items tested on an intelligence test (the meanings of words) could be eliminated if equal opportunity for exposure to the information to be tested was experimentally assured. In the three previously reported studies in this series we provided Blacks and Whites with equal opportunity for exposure to information by embedding words not apt to be known in simply worded sentences. Our aim was to clarify the meanings of the words. In ordinary discourse, however, the use of a word in a sentence may or may not clarify the meaning of the word to a naïve listener or reader. A dictionary, however, provides, not sentences, but a more common and more easily understandable term for the word in question. In two additional studies in this series, which are reported here, we asked, first, what the effect on word knowledge would be if standard dictionary definitions (e.g. TRANQUIL: serene) were employed to provide Blacks and Whites with equal opportunity for exposure to information. That knowledge was later tested. As in all previous experiments in this series, participants were also tested on their knowledge of words for which no experimental opportunity for equal exposure to the information was assured. The results of our initial experiment were consistent with those of the original three experiments. When opportunity for exposure to information was not experimentally assured, Whites knew more about the meanings of words than did Blacks. But, when equal opportunity for exposure to information was assured, Whites and Blacks did not differ in knowledge of word meanings.

In the final (fifth) study in the series, the second to be reported here, we asked how representative of the general U.S. population as to IQ were the community college students forming the subject population in our previous studies. Students (67 Whites and 26 Blacks), who attended the same two-year, community college, as did the participants in the previous studies, were tested on the PPVT-R. The average mean IQs for groups of Whites and Blacks from large representative samples in the U.S. are, respectively, 100 and 85. In the present experiment, the IQs of the Whites averaged 98.1 (SD 12.4, range 67 to 131) and the IQs of the Blacks averaged 82.6 (SD 13.7, range 62 to 112) a difference of 15.5 IQ points ($t = 5.3$, df 91, $p < .001$). In brief, throughout a series of experiments, we found that Whites and Blacks, when given equal opportunity for exposure to information (word meanings) common to IQ tests, were equal in their knowledge of that information. The results of the final experiment, presented here, tell us that such consistent findings were obtained for samples of Blacks and Whites representative of the U.S. population in measured IQ. In general, our data support the view that the search for the causes of racial differences in IQ should be aimed at the sources of differences in the information to which people in different racial groups are exposed.

The SAT and General Intelligence

Meredith C. Frey and Douglas K. Detterman
Case Western Reserve University, Cleveland, OH
mcf6@po.cwru.edu

Surprisingly, there is very little direct evidence showing the relationship between the Scholastic Aptitude Test (SAT) and general intelligence. This relationship is important for a number of reasons: 1) to establish the relationship between the SAT and general intelligence, 2) since many students have taken the SAT it could be used as a quick and dirty measure of general intelligence, and 3) since a large portion of the population has taken the SAT, it could be used as a premorbid measure of general intelligence. To investigate the relationship between SAT and general intelligence, we used the National Longitudinal Study of Youth – 79 data set. The ASVAB was used to obtain a general intelligence factor. Nearly all,(11,878 out of 12,686), participants completed the ASVAB. The first principal factor was extracted from the 10 subtests of the ASVAB. Factor scores were retained as a measure of general intelligence. These scores were then correlated with the SAT scores obtained from school records for the 917 participants who had SAT scores reported. The correlation between SAT and general intelligence was .82. However, there was a nonlinear relationship between the two measures. When a squared component was added to the regression equation, the multiple correlation was .86. There is very obviously a substantial relationship between SAT and general intelligence to the extent that the SAT should be viewed as an intelligence test. Additional data regarding the SAT and IQ will be presented that support this conclusion.

The Correlation between Individuals with Down Syndrome and their Siblings for Cognitive Task Performance

Lynne T. Gabriel
Cuyahoga County Board of MR/DD, Division of Behavioral and Health Supports, 13231 Euclid Ave., Cleveland, OH 44112-3918
gabriel_L@ccbmrdd.org

Previous research has shown that the correlation for IQ between individuals with Down syndrome (DS) and their siblings falls within the same range as the general population, whereas the correlation between individuals with nonspecific mental retardation (MR) and their siblings is significantly below this range (Gabriel, 2000). The purpose of the present study was to determine whether these same correlations would be found when basic cognitive variables were examined.

Participants included 52 individuals with DS and 51 of their siblings, and 44 individuals with MR and 41 of their siblings. All participants were administered the WAIS-R as a measure o global cognitive ability and the Cognitive Abilities Test (CAT: Detterman, 1988) to measure basic cognitive skills. Ninety-six sibling pairs were made (52 DS pairs and 44 MR pairs). There were no significant differences between groups for age. There were no significant differences between the DS and MR groups for IQ, but there was a significant difference for IQ between the DS siblings and the MR siblings, with DS siblings scoring higher than the MR siblings.

Correlations were performed between the DS group and their siblings, and between the MR group and their siblings, for each CAT variable. Correlations were corrected for the restriction of range demonstrated by the DS and MR groups. All correlations were nonsignificant. These results indicate that cognitive performance in neither the DS group nor the MR group could be predicted from their siblings' performance on the same variables. The results of the present study were compared to the results obtained from a twin study, where all but one of the correlations between twin pairs were significant at the $p < .01$ level (Thompson, Detterman, & Plomin, 1991). In contrast to the results of the present study, the results of the twin study indicate that, for typically developing siblings, performance of one sibling could be predicted from the performance of the other sibling on cognitive variables examined in the study.

The results of the present study imply that there is no relationship between siblings on basic cognitive tasks, when one sibling has a disability. One possible explanation of the results is that mental retardation, regardless of etiology, wipes of the effects that would otherwise be seen in first degree family members. Limitations of the present study and possible avenues for further research will be discussed.

References

Detterman, D. K. (1988). CAT: Cognitive Abilities Tests. Cleveland, OH: Case Western Reserve University.
Gabriel, L.T. (March, 2000). A family study of intelligence in individuals with Down syndrome and their siblings. Gatlinburg Conference on Theory and Research in Mental Retardation/Developmental Disabilities: San Diego, CA.

Thompson, L.A., Detterman, D.K., & Plomin, R. (1991). Associations between cognitive abilities and scholastic achievement. Psychological Science, 2, 158-165.

What Makes an Elementary Behavior an Indicator of Intelligence? An Investigation of Eye Movement Parameters in Relation to IQ

Niels Galley
University of Cologne, Institute of Psychology, Zuelpicherstrasse 45, D-50923 Koeln
nielsgalley@t-online.de

Looking behavior of N=325 subjects was registered from their electrooculograms in several tasks: solving RAVEN matrices, looking at a picture (=PICTURE), tracking a moving (= SINUS) or a jumping point (SQUARE WAVE), being interviewed with open (=INTERVIEW) and closed eyes (CLOSED EYES). All saccadic eye movements were on-line identified with computer aid. Mean fixation durations, saccadic latencies and other saccadic parameters (for example saccadic velocities, an arousal measure) were computed and correlated with subjects German Wechsler IQs (mean IQ 121.5 +- 12.2) and g-factors. Several significant, mostly low correlations of speed and accuracy measures to the IQs were found: For example, saccadic reaction time (a speed indicator) in the SQUARE WAVE task correlated with Performance IQ(r = -.282), but correcting for reliability (following the proposal of A.Jensen, The g-factor, 1998, p.590) which had a value of r=.68, increased the correlation to respectable r = -.61. Or the Spearman correlation coefficient between saccadic reactive amplitude (an accuracy indicator in the same task) and the performance IQ was r = .132 but corrected for reliability (r =.53) reached a value of r = .471. Or omissions in the same task (also an accuracy indicator) correlated with -.28 and corrected for reliability with -.475. Mean individual fixation durations correlated significantly negatively with IQs in some tasks (RAVEN, SQUARE WAVE, SINUS, EYES CLOSED) while reached no significance in INTERVIEW and PICTURE. The values were calculated as medians because distributions of these times were nonlinear. Additionally, for every subject we calculated the difference between the 25th and 75th rank places for the distributions of their fixation durations, the interquartile range which is an equivalent of the standard deviation in normal distributions, because we were interested in search for the universality of Jensen's RTSD rule (1998 pp.225). The interquartile ranges correlated significantly negatively for the tasks RAVEN, SQUARE WAVE and EYES CLOSED thus confirming Jensen's RTSD rule for this rather spontaneous behavior, but the negative correlations didn't reach significance for SINUS, PICTURE and INTERVIEW. Saccadic amplitudes in these tasks did not correlate with IQs (with the one exception mentioned: the response amplitudes in the SQUARE WAVE task, where was a clear target stimulus), but astonishingly, the interquartile ranges of the saccadic amplitudes correlated significantly negatively in the RAVEN, PICTURE, INTERVIEW with the IQs. Standardized saccadic velocities, an indicator of arousal, or more specific, of mental effort, correlated significantly positively with the IQs for the most strenuous SQUARE WAVE task, while for the other tasks these correlations were nonsignificant, but mostly negatively. We propose as an interpretation that the RTSD rule has a more global validity not only for time but also for space or accuracy measures: intelligence shrinks spontaneous behavior to a goal directed one by inhibition of outliers in space and time. And we assume that this should be the same mechanism that makes behavior faster. Additionally, bright people show powered goal related behavior, only when necessary.

Identifying the Type of Neural Plasticity Responsible for Intelligence: Correspondences between Fluid Intelligence and Competitive Learning Mechanisms

Dennis Garlick
Dept. of Psychology, University of Sydney, NSW, 2006, Australia.
dennisg@psych.usyd.edu.au

The challenge in explaining g is to identify what it is that seemingly different intellectual tasks have in common. In my Psychological Review paper, it is argued that g can be explained by individual differences in neural plasticity, or a general mechanism that adapts the connections in response to the environment. However, the paper does not address the issue of the nature of this general adaptation process. Initially, back-propagation would appear to be a plausible candidate as these networks are essentially error-reduction networks and the reduction of error could be applied to many different intellectual tasks. However, a number of reasons will be given as to why error-reduction is unlikely to be the general adaptation mechanism responsible for fluid intelligence, including that it is biologically unrealistic and also not powerful enough to account for performance in many novel situations. Rather, it will be argued that competitive mechanisms possess the required characteristics. The properties of these processes will be examined and their parallels with fluid intelligence highlighted.

What Makes (an) Intelligence Practical?

Linda S. Gottfredson
University of Delaware
gottfred@UDel.Edu

Robert Sternberg proposes that there exists a practical intelligence independent of g. Sternberg draws the distinction between "practical intelligence" and "academic intelligence" (g) in two ways: they are independent abilities for performing tasks with different attributes (e.g., the task is assigned vs. chosen, has one vs. many possible solutions) or different consequences (e.g., school success vs. career success). Both definitions suggest some clear predictions about how g's predictive validities will shift (1) across tasks and outcomes and (2) relative to the validities for practical intelligence (which he usually measures as tacit knowledge). A review of the sorts of tasks and outcomes that are most and least g loaded contradicts the first set of predictions. A search for data relevant to the second set reveals that there are virtually none. In short, there is no evidence favoring, and much disfavoring, Sternberg's proposal that g is academic and not practical, as he defines those terms.

Claims that intelligence researchers have ignored more meaningful forms of intelligence than g nonetheless have widespread political appeal (people can be smart in different ways) and face validity for the public at large (IQ tests seemingly measure only academic or esoteric skills). In contrast, the extensive but piecemeal evidence for the predictive validity of g in "real life" tends to be uninterpretable to the public (correlation coefficients) or even offensive (by seeming to "blame the victim" when social pathologies are at issue). It would enhance both the science of intelligence and public perceptions of it were we to systematically chart the utility of g—especially in IQ-specific, criterion-related terms—for obtaining social goods (e.g., good health, income, jobs) and producing them (job performance, law-abidingness).

Familial Patterns of Analytical, Creative, and Practical Abilities

Elena L. Grigorenko
PACE Center, Yale University and Department of Psychology, Moscow State University
elena@pantheon.yale.edu

We investigated the familiality of analytical, creative, and practical abilities. Both parents and children were given tests of analytical, creative, and practical intelligence. In all, 503 Russian children as well as 452 of their mothers and 293 of their fathers were involved. These adults were enrolled in the study through their children (276 girls and 230 boys, whose ages ranged from 8 to 17, with a mean of 12.3 and a standard deviation of 2.8). Children from a number of mainstream public schools of the mid-Russia town of Voronezh were asked to give their parents a letter that described the study and invited parental participation. The enrollment rate was about 98% among the approached female caregivers and 77% among the approached male caregivers. This ascertainment strategy, combined with the high enrollment rate, allowed us to obtain a relatively representative sample of Russian parents in Voronezh raising children.

Heritability estimates were obtained with and without family environment covariates. Heritability estimates were variable; a number of covariates were found to be significant. The presence of a number of covariates modified heritability estimates. Formal segregation analyses were carried out to investigate the plausibility of specific genetic models in the familial transmission of analytical, practical, and creative abilities.

Ethical Concerns Raised by Current Conceptualization of "Intelligence," "IQ," and "g"

Douglas J. Herrmann and Thomas C. Cadwallader
Indiana State University
pytomc@scifac.indstate.edu

Few (no?) concepts within psychology and education have had or will have more important societal impacts than "intelligence," "IQ," and "g" (hereafter, IIQg). This paper suggests that due to the importance of these impacts, the IIQg community should give increased attention to ethical concerns raised by current views of IIQg. The goal of this attention would be to increase the greatest societal good and to reduce societal harm. In general, the IIQg community has argued that Blacks show scores lower than Whites and that this difference is due to genetic/neurophysiological variables. These conclusions have been challenged by other psychologists and educators, statisticians, biologists, neuroscientists, and others (hereafter, the IIQg opposition), who charge that inadequate attention has been given to the environmental hypothesis. Although many environmental variables have indeed been investigated, it has been argued that more complex variables should be considered, e.g., privilege (including anti-privilege); cultural use of leisure – especially limited or no leisure and anti-leisure; the physiological consequences of many generations of below-normal nutrition, health care, education, recreational facilities, etc.; the emotional consequences of 250 years of sometimes brutal slavery, a hundred years of gross or brutally gross discrimination, and current discrimination in a present-day American society that still offers unequal opportunities for Blacks (and others); the emotional consequences of knowing that they and/or relatives and/or friends, were the consequence of the rape of female ancestors by their slave-masters -- sometimes for successive generations. The IIQg community has given inadequate attention to these consequences of living in a nation with a horrendous history of slavery and discrimination against Blacks. Similarly, many of the issues raised by the IIQg opposition need to be addressed. At the 2000 ISIR meeting, persons of color were conspicuous by their absence. So too members of the IIQg opposition. Perhaps efforts have been made for greater participation by these two groups for the 2001 ISIR meeting. Perhaps greater efforts might be warranted for the 2002 meeting. Might not much be gained by having broad critics, e.g., Robert Williams, the former president of the Black Psychological Association, author of the BITCH test, and coiner of the term, Ebonics; and the historian of science, Garland Allen (see his "Essay on science and society," "Is a new eugenics afoot?," Science, 5 October 2001, pp. 59-61)? Although ISIR represents only a portion of the IIQg community, its focus on these matters gives it an opportunity to take the lead in efforts to better address the issues pointed to by both the IIQg community and its opposition. Surely, the chief beneficiary will be the society both communities wish to serve.

Individual Differences in Spatial Orientation: A Virtual Approach

Earl Hunt
University of Washington, Seattle, Washington
ehunt@u.washington.edu

Individual differences in spatial orientation are very large. On the other hand, it is hard to investigate this topic because a "real" investigation requires taking people to an unfamiliar place and watching them as they explore it. This is an expensive proposition. Therefore we often resort to surrogate measures, such as performance on a paper and pencil orientation test. The development of computer-generated virtual environments (VE) provides another source of data. I will describe some of the published and yet unpublished data from our laboratory showing that performance in virtual environments is related to performance in real environments, and that it has the effect of exaggerating individual differences, especially with reference to male-female differences in orientation performance.

Men and Women at Promise for Scientific Excellence: Similarity not Dissimilarity

David Lubinski, Camilla Persson Benbow, Daniel L. Shea,
Vanderbilt University
Hossain Eftekhari-Sanjani and Marcy B. J. Halvorson
Iowa State University
david.lubinski@vanderbilt.edu

U.S. math-science graduate students possessing world-class talent (368 males, 346 females) were assessed on psychological attributes and personal experiences in order to understand how their talents emerged and developed. Comparisons were made, using similar assessments, to mathematically talented students (528 males, 228 females) identified around age 13 and tracked into adulthood by the Study of Mathematically Precocious Youth (SMPY). On attributes prerequisite to scientific distinction, graduate students corresponded to earlier psychological findings on distinguished (but exclusively male) scientists: exceptional quantitative reasoning abilities, relatively stronger quantitative than verbal reasoning ability, salient scientific interests and values, a remarkable amount of energy, and a strong desire to make an impact through one's work. On these attributes, sex differences were minimal for the graduate students (but not for the SMPY comparison groups). The graduate students represent a subset of the mathematically gifted (i.e., those with an intense commitment toward developing scientific skills). Although the graduate students were somewhat less able than the SMPY sample, they had achieved much more by this developmental stage, which underscores the importance of non-intellectual factors. Development of math-science expertise apparently requires special but similar educational experiences across both sexes. Modeling gender disparities in the math-science pipeline should incorporate both opportunity and personal attribute factors. Of the neglected personal attributes in this area, spatial ability is probably the most important.

Is General Intelligence a Composite of a Few Basic Cognitive Processing Components?

Dasen Luo,
Department of Psychology, Indiana University of Pennsylvania, Indiana, PA 15705
Lee Anne Thompson, and Douglas K. Detterman
Case Western Reserve University
dluo@grove.iup.edu.

Recent studies of intelligence suggest that general intelligence, or g,can be decomposed into a small set of basic cognitive processes. Can the same set of basic processes adequately represent general intelligence (g) across the lifespan? A nationally representative sample spanning childhood through senescence used to establish the norms for the Woodcock Johnson III (W. Woodcock, McGrew, & Mather, 2001a, b, c) is analyzed in the present report to explore this developmental question. Multiple regression models indicate that from 6 to 80 years g, defined as correlations among intelligence tests and achievement measures, is mediated by basic cognitive processes, representing three distinct areas: Speed of Information Processing, Working Memory and Long-Term Memory Retrieval. Processing Speed, Working Memory, and Long-Term Retrieval clusters account for more than two-thirds of the multiple correlation between Comprehension-Knowledge, Fluid Reasoning, General Intellectual Ability, and Total Achievement. Results from a structural equation modeling approach indicate that the latent factors of Processing Speed and Working Memory account for over 70% of the variability shared among the other ability factors in the 14-19 age group, and over 80% in all the other age groups. When Long-Term Memory Retrieval tests were taken into account, almost 100% of the variability of g in all age groups was accounted for The results provide evidence that g can be reduced to the same set of basic cognitive processing components in all age ranges.

The Role of Processing Speed in Between-Age and Within-Age g Variability: Differential Compositions of General Intelligence?

Dasen Luo,
Department of Psychology, Indiana University of Pennsylvania, Indiana, PA 15705
Lee Anne Thompson, and Douglas K. Detterman
Case Western Reserve University
dluo@grove.iup.edu.

The influence of processing speed on individual differences in the general cognitive ability, or g, has been documented by numerous studies. Fewer studies have examined the influence of processing speed on g from a developmental perspective. The present study explores the differential impact of processing speed on within-age versus between-age variance in g using the data from 532 primary school children in the age range of 6 to 12. Chronometric measures such as reaction time and stimulus discrimination time from the Cognitive Abilities Test (CAT) battery and the raw score of Perceptual Speed of the Colorado Specific Cognitive Ability Test (CSCA) were used to represent processing speed. Raw scores from the Wechsler Intelligence Scale for Children, Revised (WISC-R) subscales, the Peabody Picture Vocabulary Test, and several CSCA.subtests were used to represent g. Multiple regression models and structural equation modeling methods were used to partition the covariances between the processing speed tests and tests representing g into between-age and within-age variance components. The results suggest that processing speed mediates almost all of the between-age g variability, but only a portion of the within-age g variability. Formal education does not appear to provide an explanation for the role of processing speed in between-age g variability, as the role of processing speed remains dominant when the grade level of primary school children is controlled. These results were compared to those from the Woodcock-Johnson III normalization sample data, which also indicate a dominant role of processing speed in the between-age g variability throughout the life span. It appears that the between-age g variability may be qualitatively different from the within-age g variability, with the former being reducible exclusively to processing speed, while the latter having a more heterogeneous composition.

The Heterosis Theory

Michael Mingroni
University of Delaware
mingroni@UDel.Edu

In a recent article, Dickens and Flynn have used the term “IQ paradox” in reference to the puzzling fact that test scores have undergone large secular changes over time, while consistently displaying high within-population heritability (h2~ 0.75 for adult IQ). However, the so-called IQ paradox is not at all unique to IQ. Height (h2~0.9), age at menarche (h2~0.8), head circumference (h2~0.6), the incidence of myopia (h2~0.8), and the incidence of asthma (h2~0.6), have also undergone large secular changes. In addition, there is a growing body of evidence that the incidence of two cognitive disorders, autism (h2~0.9) and ADHD (h2~0.8), have also been rising.

Currently, there is no generally agreed upon environmental explanation for any one of the trends listed above, and it seems unlikely that compelling environmental explanations will soon be found for all of them. For this reason, a consideration of possible genetic hypotheses is warranted. It is argued in the present paper that the genetic phenomenon heterosis, also known as hybrid vigor, represents a very plausible cause of the observed trends. The occurrence of heterosis is consistent with the finding of parallel trends in a number of traits, and it also resolves the “paradox” of the traits’ high heritability. Heterosis also represents a potential cause of other observed trends, including a rise in certain hormonal cancers, a decline in infant mortality, a decline in sperm counts, and a trend toward increased left-handedness.

Discussion will focus on possible approaches to testing the theory, particularly the use of DNA analysis, both at the population and individual levels.

Case Study of a Musical Prodigy

Joanne Ruthsatz
Notre Dame College of Ohio
JoRuthsatz@aol.com

Prodigies are children under 10 years of age who perform culturally relevant tasks at a level that is rare even among highly trained professionals. While there is no lack of fascination or speculation about the origins and underpinnings of musical prodigies, little work and less actual data exist to offer much in the way of an explanation of this rare phenomenon. The present study investigated a six-year old musical prodigy. A new summation approach was used as a framework to investigate the cognitive, musical and practice elements that are involved in becoming an exceptional performer.

Spatial Visualization as a Determinant of Academic and Vocational Choices

David H. Schroeder and Kwang Min Jang
Johnson O'Connor Research Foundation161 East Erie Street, Room 304, Chicago, IL 60611
Dschroed2@aol.com

In a previous factor analysis of a cognitive-ability battery, we found that the first factor after g showed a large loading for spatial visualization. A subsequent comparison of occupational groups showed sizable differences along the vector where visualization fell in the factor analysis. In this presentation, we examine directly the role of spatial visualization and argue that it has important relationships with persons' life choices. We briefly review types of visualization tests and previous research on visualization for various occupations. Then, using contemporary large-sample data, we compare the efficacy of g and visualization in differentiating occupational and major-field groups. We also examine the roles of gender and job satisfaction as mediators or moderators of these relationships. In conclusion, we believe that spatial visualization is an important factor in what persons do in life (e.g., vocational choice), perhaps more so than how well they do it (vocational performance).

Larger-Scale Empirical Tests of Aspects of the Theory of Successful Intelligence

Robert J. Sternberg
Director, Center for the Psychology of Abilities, Competencies, and Expertise, Yale University
robert.sternberg@yale.edu

A variety of tests have been conducted of the theory of successful intelligence, mostly on relatively small samples. In the past couple of years, opportunities have arisen to test aspects of the theory on larger samples.

One project, referred to as the "Rainbow Project" and conducted in collaboration with investigators from 16 different universities (of widely varying levels of selectivity) and high schools across the United States, tests the construct validity and especially the incremental validity of measures of creative and practical abilities relative to the SAT for predicting academic performance and personal adjustment in college. The project is supported by the College Board. The data from this collaborative project, involving roughly 1000 students, are currently being analyzed. But we already have good evidence of construct validity from factor-analytic investigations and of incremental validity for prediction relative to self-reported SAT scores (with actual SAT score reports following shortly). I will report the construct validity data at the meeting.

A second project, referred to as the “Michigan Project,” and conducted in collaboration with investigators from Yale University and the University of Michigan, investigates the construct validity and incremental validity of a test of practical intelligence (measuring the acquisition of tacit knowledge) on one complete class of University of Michigan MBA students (with an N in excess of 400) and a second class of students who elected to participate. This project was funded by the University of Michigan Business School. Analyses of the data reveal good construct validity of the tests, and substantial incremental validity of the test relative to the GMAT in predicting final GPAS at the completion of the two-year MBA program.

Neither these two studies, nor any other set of such studies, will be conclusive. But the studies do, I believe, support the theory of successful intelligence. Of course, there is good evidence for the validity of so-called g-based measures for predicting many different criteria. It is unclear why people continue to conduct studies on the external validity of g-based predictors, as their validity has already been conclusively shown and there are no more serious skeptics to convince. Although there is no harm in endlessly repeating arguments already made or in conceptually replicating studies done over the past 100 years or so, it is not clear that there is much benefit either, as the arguments already are established as correct. A better use of intellectual, financial, and time resources is to seek psychologically to understand g through internal-validation studies, as many investigators are doing, or to explore diverse classes of expanded measures—outside the range of g-based measures typically used on conventional tests--that might add to the external validity of g-based measures. Our explorations of such expanded measures suggest that they can successfully augment the prediction provided by g-based measures.

The Role of Intelligence in the Components of Reading

Rolando D. Tiu, Jr., Lee A. Thompson, and Barb A. Lewis
Case Western Reserve University, Cleveland, OH 44023
rdt5@po.cwru.edu

The purpose of the present study was to test the role of IQ in a component model of reading. The present study also investigates whether the processes involved in reading differ between a reading disabled group and a normal reading group of children. Reading disabled and normal reading children were administered tests of reading comprehension, listening comprehension, decoding, processing speed, and intelligence. Results indicate that processing speed explains a significant amount of variance in reading comprehension over that accounted for by listening comprehension and decoding alone. IQ accounts for a significant amount of variance in reading over that accounted for by the listening comprehension, decoding and processing speed. Additionally, IQ significantly predicts speed of processing and listening comprehension in both reading disabled and normal reading children. Path analyses indicate that the effect of IQ on reading is partially mediated by decoding in reading disabled children. The results point to the importance of the role of processing speed and IQ in predicting reading comprehension.

Racial Differences in the Relationship between g and Income

Rolando D. Tiu, Jr.
Case Western Reserve University, Cleveland, OH 44106
rdt5@po.cwru.edu

The regression lines predicting income from a general factor score derived from the Armed Services Vocational Aptitude Battery (ASVAB) were examined in the male participants of the National Longitudinal Survey of Youth begun in 1979 (NLSY79). Nyborg and Jensen (2001) reported differences in the regression line for blacks and whites. These differences appeared to indicate a disadvantage to whites when g was taken into account. It was hypothesized that these findings were the results of affirmative action. The extension of this hypothesis would be that Hispanics should have a similar line to the blacks with a higher slope than whites. Additionally, for over-represented minorities like Jews and Asians, the slopes of their lines should be lower than that for whites. Regression lines from Whites, Blacks, Hispanics, Jews, and Asians were found to differ significantly from each other. However, the pattern of results was in the opposite direction as the hypothesized pattern. Over-represented minorities (Jews and Asians) had higher slopes than Whites, while under-represented minorities (Blacks and Hispanics) had equal or lower slopes than Whites. These results indicate that Whites are not relatively disadvantaged to Blacks or Hispanics when g is taken into account, but perhaps are disadvantaged compared to Jews and Asians.

Symposium:
Differences in Scores on Tests of Intelligence Related to Racial Identification

Nathan Brody
Wesleyan University
nbrody@wesleyan.edu

Overview

Why do groups who differ in their racial identification exhibit mean differences in scores on tests of intelligence? Each of the speakers in this symposium will address this question. Symposium presentations will be followed by discussion among the symposium participants and then by questions from the audience. The participants and their topics are:

Nathan Brody: “The evidence for the “Default Hypothesis” is not persuasive”

Greg Duncan: “Socioeconomic resources, race and achievement”

Arthur Jensen: “The “Default Hypothesis” of the Black-White difference in the g Factor”

John Loehlin: “To what extent are Black-White differences due to a difference in prenatal environments?”

Symposium: Race and IQ
The Evidence for the "Default Hypothesis" is not Persuasive

Nathan Brody
Wesleyan University
nbrody@wesleyan.edu

Jensen argues that Black-White differences are explained by the "default hypothesis." The default hypothesis assumes that the determinants of between group differences are congruent with the determinants of within group differences. Since intelligence is heritable, the default hypothesis implies that genetic influences contribute to Black-White differences in scores on tests of intelligence. In his book, The g factor, Jensen reviews five kinds of studies in support of the default hypothesis. 1. Studies of racial differences in brain size and myopia. 2. Trans-racial adoption studies. 3. Studies of individuals with heterogeneous racial backgrounds. 4. Regression analyses. 5. Statistical analyses of relationships among between and within group differences. The studies cited by Jensen are reviewed and his interpretation of these studies is evaluated. It is concluded that none of the studies cited provide clear evidence in support of the default hypothesis.

Symposium: Race and IQ
Socioeconomic Resources, Race and Achievement

Greg J. Duncan
Northwestern University
greg-duncan@northwestern.edu

How family socioeconomic status (SES) affects children's cognitive skills is not well understood. If SES is considered to be a shared family environmental trait and a product of parental genes, it is easy to dismiss the evidence from most studies that purport to show that SES is an important determinant of children's cognitive development. I first argue that a key component of SES – family income- is best considered a non-shared environmental characteristic. The yearly volatility of income renders the early-childhood income histories of siblings quite different. Furthermore, these income differentials are significant determinants of sibling differences in achievement. Second, I argue that evidence from a number of random-assignment experiments establishes that differences in family income resources causes differences in children's test scores. Third, I argue that SES is typically ill measured in most developmental studies, and show that a broad conception of SES that include grandparental-generation resources accounts for a substantial fraction of racial difference in children's test scores, even in the presence of controls for parental cognitive skills.

Symposium: Race and IQ
The "Default Hypothesis" of the Black-White Difference in the g Factor

Arthur R. Jensen
University of California, Berkeley
3330 Southlake Drive, Kelseyville, CA, 95451-9042

A number of lines of evidence converge on what I call the "default hypothesis," namely, that the statistical difference between the black and white populations in general ability, defined as psychometric g, is essentially of the same nature as individual differences within each population with respect to proximal correlates and causal factors. The main classes of evidence relevant to this hypothesis are briefly described: test bias, mental growth trajectories (Piaget, Gesell, Freedman, Rowe), transracial adoption, Spearman's hypothesis, mental chronometry, cross-cultural consistency, brain correlates, and differential birthrates. It is claimed that these many lines of evidence are more consistent with the default hypothesis than are the parochial and usually ephemeral ad hoc hypotheses invoking only cultural and social influences as explanatory factors.

Symposium: Race and IQ
To What Extent are Black-White Differences Due to Prenatal Environments?

John Loehlin
University of Texas, Austin
loehlin@psyvax.psy.utexas.edu

I plan to discuss the evidence (both pro and con) that black-white IQ differences have an important pre-natal environmental component. I will also consider what kinds of evidence would help us to decide whether such an environmental effect were in turn genetic (by way of the mother's genes).

Symposium:
Examining Biological Determinants of Inspection Time and Intelligence.

Con Stough, Organizer
Neuropsychology Laboratory, Swinburne University, PO Box 218 Hawthorn, Victoria 3122 and
Brain Sciences Institute, Swinburne University, 400 Burwood Road, Hawthorn, Victoria, 3122.

Overview

This symposium brings together three recently conducted studies examining biological processes underpinning individual differences in Inspection Time (a robust non-verbal correlate of psychometric IQ) and intelligence. The symposium represents research utilising state of the art cognitive neuroscience techniques and which include functional magnetic resonance imaging (fMRI), functional magnetic resonance spectroscopy (fMRS) and neuropsychopharmacology in an effort to elucidate key biological processes that determine Inspection Time and intelligence. The first presentation by Dr Bates describes recent work attempting to link activity of human neural ion channels with Inspection Time. Professor Deary presents recent research from the University of Edinburgh examining relationships between functional areas of the brain and Inspection Time performance using functional Magnetic Resonance Imaging. Professor Stough, in the last presentation of the symposium discusses some of his recent research examining neurochemical determinants of Inspection Time, Digit Span and Digit Symbol with particular relevance to serotonin and dopamine. Discussion at the conclusion of the third presentation will focus on our current understanding of the biological basis of intelligence.

Presentations:

Timothy Bates and Caroline Rae “Basic mechanisms for inspection time”

Con Stough, Pradeep Nathan, Examining the neurotransmitter basis of intelligence
and Jim Thompson and speed of information processing.

Open Discussion

Sympsoium: Biological Determinants of IT and IQ
Basic Mechanisms for Inspection Time

Timothy Bates
Department of Psychology, Macquarie University
and Caroline Rae
Department of Physiology, University of Sydney

Inspection Time (IT) measures the duration for which a stimulus must be presented in order to be accurately reported. This critical duration correlates around .5 with g: a finding which many authors including ourselves have used to support variance in speed of mental processing as the psychological basis of differences intelligence. However this does not speak to the biological basis of intelligence. In order to better understand the biological basis of the IT-IQ correlation, we investigated the effects of very brief inter-trial intervals on IT effects. Comparison of IT trials preceded by a 5-second rest period of to ITs collected immediately after a period of high processing demand implicated individual differences in the viability of short-term biochemical mechanisms involved in maintaining the Na-K pump which supports membrane potentials. This hypothesis was further supported by examine the effects of two bio-supplements known to affect membrane fluidity (omega-3 fatty acids) and Na-K pump energy reservoir capacity (creatine). It is concluded that rapid information processing is the basic psychological mechanism underlying g, and that individual differences in a number of biochemical mechanisms support these individual differences in mental speed.

Sympsoium: Biological Determinants of IT and IQ
Examining the Neurotransmitter Basis of Intelligence and Speed of Information Processing

Con Stough, Pradeep Nathan and Jim Thompson
Neuropsychology Laboratory, Swinburne University, PO Box 218 Hawthorn, Victoria 3122
Brain Sciences Institute, Swinburne University, 400 Burwood Road, Hawthorn, Victoria, 3122.
CStough@groupwise.swin.edu.au

There is now an extensive body of literature in differential psychology describing the role of speed measures in cognitive ability. A prominent speed measure has been the Inspection Time (IT) measure of early information processing. We have recently reported that IT is mediated by the neurotransmitter Acetylcholine and by cholinergic system activity. This conclusion is based on experimental studies in which the level of the neurotransmitter Acetylcholine is manipulated and on studies in which we systematically block nicotinic and muscarinic receptors and assess performance on the IT task. However acknowledging that IT is an important but inadequate model of human intelligence we are now extending this model by administering other measures of intelligence such as Digit Span and Digit Symbol from the Wechsler Intelligence Scales and manipulating other neurotransmitter systems. We present our preliminary work examining the role of Serotonergic, Noradrenergic and Dopaminergic systems in human intelligence. A biological model of intelligence, based at a neurochemical level is hypothesised in which the neural basis of information processing speed, working memory and attention is separated.

Symposium: Jensen Effects in the Netherlands and South Africa

Jan te Nijenhuis, Organizer
Arthur Jensen, Chair

Overview

This symposium examines the “Jensen effect”. The “Jensen effect” suggests that differences between some groups in IQ are largely due to general intelligence. This effect is demonstrated by showing that the g-loading of a set of tests or subtests is correlated with the magnitude of the difference between groups on those tests or subtests.

Individual Presentations:

J. Philippe Rushton, Studies of g in African, Indian, and White
and Mervyn Skuy and Peter Fridjohn Engineering Students in South Africa

Jan te Nijenhuis and Henk van der Flier Immigrant-Majority Group Differences on
Cognitive Tests: Jensen Effects, Cultural Effects, or
Both?

Arthur Jensen Discussant

Symposium: Jensen Effects
Studies of g in African, Indian, and White Engineering Students in South Africa

J. Philippe Rushton,
University of Western Ontario, Canada
and Mervyn Skuy and Peter Fridjohn
University of the Witwatersrand, South Africa
Rushton@julian.uwo.ca

Seven studies have now been carried out in sub-Saharan Africa supporting 'Spearman's (1927) hypothesis' that Black/White IQ differences are mainly on g, the general factor of intelligence (and hence are 'Jensen Effects'). Lynn and Owen (1994, J. Gen. Psychol.) were the first to explicitly find this effect in their analysis of South African data. Rushton and Skuy (2000, Intelligence) followed with a study of South African university students, finding that the more the items from the Standard Progressive Matrices measured g (estimated by item-total correlations), the more they were related to standardized African/White differences. This paper summarizes two studies of 300 South African first-year engineering students given the Raven's Standard Progressive Matrices (SPM) and then, three months later, the Advanced Progressive Matrices (APM). On the APM the African students had a mean IQ equivalent of 103 and the White students of 117. External validities were established, with both the African and the non-African students' scores on the SPM predicting scores on the APM (mean $r = 0.60$; mean $ps < 0.001$) and both sets of scores predicting examination marks (mean $rs = 0.30$; mean $ps < .01$). The standardized African/Indian/White differences on both the SPM and the APM were most pronounced on those items with the highest item-total correlations (assessed using either point-biserial or biserial correlations). The g-loadings showed cross-cultural generality, with those calculated on the Indian students predicting the magnitude of the White/African differences. When the items were aggregated four at a time into 'sub-tests', the magnitude of the Jensen Effect was similar to that from studies based on whole sub-tests (median rho = 0.52).

Symposium: Jensen Effects
Immigrant-Majority Group Differences on Cognitive Tests: Jensen Effects, Cultural Effects, or Both?

Jan te Nijenhuis
Universiteit van Amsterdam, the Netherlands
and Henk van der Flier
Vrije Universiteit, Amsterdam, the Netherlands
ao_tenijenhuis@macmail.psy.uva.nl

Spearman's hypothesis (Spearman, 1927) holds that White-Black differences in mean scores on intelligence tests are dependent on the g loading of the tests. Jensen (1992, 1998) states that Spearman's hypothesis is to be regarded as an empirical fact.

Cross-cultural test research has provided us with many examples of groups not possessing the specific skills presupposed by standard ability tests to a sufficient degree (Berry, Poortinga, Segall, & Dasen, 1992; Deregowski, 1979; Hudson, 1960, 1967; Van de Vijver, 1997). However, can these findings be generalized to populations of immigrants into Western countries?

Mean IQ scores of non-native born, non-majority-language-speaking immigrants in the Netherlands are lower than those of the majority group (te Nijenhuis & van der Flier, 2001). As many West-European countries resemble each other in that most of their immigrants come from third-world countries, including former colonies, it may be that the Dutch findings are generalizable to these West-European countries. Several studies (te Nijenhuis & van der Flier, 1997; te Nijenhuis, Evers & Mur, 2000; te Nijenhuis, Tolboom, Resing, & Bleichrodt, 2001) have shown that the difference between the mean scores of majority group members and immigrants on the subtests can be predicted from the degree to which these reflect general intelligence. The only clear, empirically supported biasing factor is proficiency in the majority language.

In an excellent, innovative paper Helms-Lorenz, van de Vijver, and Poortinga (submitted) suggest that cross-cultural differences are more strongly caused by cultural differences than by g. Their study of immigrant children fails to support Spearman's hypothesis: a negative correlation is reported.
The cultural hypothesis was tested by testing Spearman's hypothesis on a sample of immigrant job applicants that took both a culture-loaded cognitive test (the GATB) and culture-reduced safety aptitude tests (attention and perceptual-motor tests). The resulting regression lines differed, but the effects were not strong. So, there is only light support for the cultural hypothesis, and it is in line with the abundant findings of a light bias due to non-optimal language proficiency of immigrants.