

SASP News



Student Affiliates in School Psychology
Summer, 2002

Volume 2, Issue 4

A PUBLICATION OF APA DIVISION 16 STUDENT AFFILIATES OF SCHOOL PSYCHOLOGY
www.saspweb.org

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Student Affiliates in School Psychology

Using Your School Psychology Background to Enhance Your Internship Application to an APA-Approved Site:

Yes, The Rumors are True, It Can Be Done!

David Shribberg, SASP President

Northeastern University

Gena Ehrhardt, SASP President-Elect

Indiana State University

Almost from the first day of our graduate studies, we were told to be prepared. Throughout our graduate careers we would be enhancing our depth and breadth of experience. Yes, getting into a doctoral program shows that we must be accomplished people capable of gaining knowledge through courses, field placements, and research projects -- but even with all this, there was the "i-word," (*internship*) awaiting us. Even more ominously, the process for applying for internship was known to drive previously competent and accomplished students into fits of anxiety and terror, negating their years and years of good work.

While there is every reason to take the internship process seriously, there is absolutely no reason to be scared. If you have made it to the point in your graduate career where you are ready to apply for an internship, there is every reason to believe that, with a little planning and strategy, your internship search will be a successful one. The most recent internship data indicate that 85% of students who registered for the internship match during the 2001-02 application period were successfully matched on match day, with 83% of this group matched to one of their top three choices. The APPIC web site (www.appic.org) provides an excellent summary of recent internship data.

We both have just finished successful applications for internship sites for the 2002-03 academic year. What follows are some of our personal observations about how to be a successful internship applicant. (cont...)



There is a fine line between confidence and arrogance. David attended some interviews where his fellow applicants made the sites feel as if they were doing the sites a big favor by granting an interview, and we cannot imagine that this is a good strategy. By the same token, we have also known school psychology students who have bought into the myth that they are somehow less competent than their counseling and clinical psychology counterparts. Your essays and mannerisms should reflect that you belong—there is no need to be defensive about your background. If you have come this far in a doctoral program, you are a competent and accomplished person, do not be afraid to let this show by being confident.

- ◆ *Be proud of your school psychology background*

While this is very unfortunate, we know that there are sites that are unfamiliar with the training of school psychology students. However, we believe that there are many more sites that either already have positive feelings about school psychology or could be influenced to see your school psychology background as a strength—if you see it that way. Of course, the pertinence of your school psychology background will inevitably vary depending on the internship site, but there are many ways that a school psychology background (particularly for students who also have a good counseling background) can accurately be portrayed as a very positive selling point for non school-based sites. For example, if you have an extensive background in schools, you probably have experience working with professionals from a

variety of disciplines (e.g., teachers, nurses, special educators, speech/language pathologists, etc.). This gives you an advantage over applicants who have primarily worked with other psychologists, particularly when you are applying to multidisciplinary sites. Another advantage school psychologists have is that the very nature of our job requires us to think on our feet and be flexible. A school psychologist might plan on seeing student A, but then a crisis happens with student B that takes precedence. This flexibility and ability to think on our feet gives us an advantage over students who have primarily worked in settings with defined client contact hours.

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A school psychologist also needs to have solid leadership skills while being a team player—skills valued by almost any internship site. And, if you are applying to a site that consults with schools, you can offer the distinct advantage of being able to translate your internship sites goals into language that can be effective in schools—a skill very few non school psychology students have.

These are but a few of the advantages of being a school psychology applicant. Obviously, the advantages you choose to highlight will depend on your particular background and (*cont...*)



experience, but do not be afraid, when appropriate, to present your school psychology background as a strength! If you see it as a strength--and can speak to this convincingly--it can be a great advantage.

- ◆ *Use SASP as a resource to find out about sites*

Wondering if a site that you have applied to is friendly to school psychology graduate students? Wondering what sites other school psychology graduate students are applying to and how they are incorporating their school psychology background into their applications? The SASP listserv (see www.saspweb.org/eforum.html for instructions on how to join) is a great mechanism for connecting with graduate students across the country. A primary goal for SASP during the 2002-03 academic year is to develop a network connecting recent successful internship applicants with students in the process of applying to internship. We find that the more energy students put into connecting with other students, the more comprehensive and accurate information they obtain. According to data provided by APPIC Match Coordinator Dr. Greg Keilin (a featured guest at a September 2001 SASP online chat), school psychology students make up approximately 5% of the internship applicant pool—the better we support one another the better the outcome for all of us!

- ◆ *Don't rule too many sites out too quickly*

The APPIC web site (www.appic.org) is an outstanding research tool that should be anyone's first stop for information about the internship process. Another excellent resource is APAGS's internship manual (to order this manual or to register for

APAGS 2002 internship workshop at the upcoming APA conference, go to www.apa.org/apags), as well as an article written by two former leaders of SASP, Matt Turner and Rebecca Mandal (available online at www.saspweb.org/internship.html).

These sources all provide excellent overviews of the internship process, and can put you on the right path in your journey. A word of caution, though: Do not assume anything about a site unless you hear it from them directly. For example, an internship site may be listed online as not accepting school psychology internship applicants. We have found that this is not necessarily an absolute—the sites we checked out seemed more interested in finding the best fits for their program than the degree that applicants were pursuing. Obviously, it would be foolish to apply *only* to sites that discourage school psychology applicants, as it would also be foolish to spend an excess amount of time completing a comprehensive supplemental application for a site that actively discourages school psychology applicants. If the site

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better the outcome for all
of us!**

uses the generic APPIC form and its training area coincide with your professional goals, why not apply to that site? What do you have to lose? Call the training director, and inquire about the site's level of receptiveness toward your application. This gives your name recognition among other applicants, and you will feel more (*cont...*)



confident knowing that your application will be considered. We have known several school psychology students who have been pleasantly surprised when they obtained interviews at sites that they at first thought were out of bounds.

There are multiple ways school psychology graduate students can find success in obtaining an APA-approved internship. Does prejudice against school psychology graduate students continue to persist? Almost certainly. Should you let this be a barrier to seeking the internship sites you desire? Definitely not! School psychology students bring many positive attributes to an internship site (e.g., creativity, an ability to work with persons from many disciplines, an ability to work within teams, exposure to a wide range of clinical issues), and it is your job to highlight those positive attributes most germane to your own background, and position these as selling points for your application. Do you need to state over and over again that you are a school psychology student? Of course not. But do not sell yourself short either—while some prejudice may persist, we have found that there are many internship supervisors who are open to viewing your background as a strength if you lay the groundwork for this interpretation.

Good luck on your search and contact us anytime (Dave Shriberg- dshriberg@yahoo.com, Gena Ehrhardt- hardt13@juno.com) with questions or ideas! Ψ

SASP Convention

SASP Convention Affairs would like to remind you to mark your calendars for the 2002 SASP Convention, which will be held Friday, August 23, 2002 during the 110th Annual APA Convention in Chicago, Illinois. The convention will be held in the Division 16 Hospitality Suite, Hyatt Regency McCormick Place and will go from 12-3pm. This year's convention will be addressing professional development issues related to internship, grant writing, and cultural diversity. Convention activities this year will include a formal address by our keynote speaker, presentations, and a reception.

Later that same evening on August 23, 2002, there will be a SASP Officers meeting and social. All SASP members are welcomed to attend. It will be from 6-9pm in the Division 16 Hospitality Suite at the Hyatt Regency McCormick Place. Ψ

CONGRATULATIONS!

SASP News would like to congratulate all those who will be beginning their internship in the coming months. We know you worked hard for many years to get to this position, and we know you will do an outstanding job!



9th Annual Institute for Psychology in the Schools

EXPANDING OPPORTUNITIES FOR PSYCHOLOGISTS: Increasing Children's Access to Psychological Services

**Wednesday, August 21, 2002, 12 - 5
Hilton Chicago and Towers, 2nd Floor
Chicago, IL**

Opening Address

Robert J. Sternberg, PhD, PACE Center, Yale University, APA President-elect

Keynote Address

Karen Callan Stoiber, PhD, University of Wisconsin - Milwaukee

School Entry Issues

Mary Walsh, PhD, Boston College

Legal and Ethical Issues for Psychologists in Schools

Susan Jacob, PhD, Central Michigan University

How to Implement School-based Psychological Programs

Peter Sheras, PhD and Dewey G. Cornell, PhD, UVA Youth Violence Project

**Nancy Lever, PhD and Jennifer Axelrod Lowie, PhD, University of Maryland School
Mental Health Program, Baltimore Public Schools**

Mary E. Courtney, PhD and Lori Evans, PhD, NYU School Partnership

Closing Session

Ronald S. Palomares, PhD, Policy and Advocacy in the Schools, APA

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**Expanding Opportunities for Psychologists:
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12 – 5**

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WELCOME THE SASP OFFICERS FOR 2002-2003:

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*Indiana State University***

Technology Chair: A. Alexander Beaujean, *University of Missouri-Columbia*



SASP Interviews: Arthur R. Jensen

A Alexander Beaujean

University of Missouri—Columbia

Coinciding with SASP's goal to help develop school psychology research-practitioners, SASP is beginning a student-oriented conversation series with professionals in school psychology and related fields. For the inaugural dialogue, Arthur R. Jensen agreed to answer some questions on intelligence, psychometrics, genetics, and education.

Dr. Jensen earned a baccalaureate from the University of California at Berkeley, a Master's from San Diego State University, and a Ph.D. in clinical psychology from Columbia University, where he worked under Percival Symonds. From 1956-1958, he worked on a postdoctoral fellowship under Hans Eysenck, a prominent researcher in London School of Psychology, the school of thought that Francis Galton and Charles Spearman ascribed, and a worldview that would have a strong impact on Jensen's future research. In 1958, he returned to Berkeley to become an assistant professor of educational psychology, where he remained for the rest of his academic career and is now professor emeritus.

During his years at UC-Berkeley, Jensen became increasingly interested in human cognitive abilities. He took up research initially started by Francis Galton and Charles Spearman, namely that human cognitive abilities, as diverse as they might be, all have a common general factor (called g) and this common factor can be measured, in part, via studies on reaction time (a field of study called Mental Chronometry). His monumental production of

*scholarship (over 400 peer-refereed or invited publications) has earned him the adulation of his peers and a permanent place in the history of intelligence research. This fact was reflected in a 1998 edition of the journal Intelligence, which was entirely dedicated to Jensen's life and research; moreover, he was recently named as "One of the Most Eminent Psychologists of the 20th Century." In October 2002, Westview Press will publish a book entitled Intelligence, Race, and Genetics, in which famed Skeptic interviewer Frank Miele questioned Jensen in-depth about his life and multi-faceted research.**

Beaujean: With the popularization and push for curriculum-based assessment and similar types of non-standardized, easy-to-administer/score assessment, is standardized cognitive assessment (e.g., Wechsler instruments, Stanford-Binet), still a valid activity? Is there anything psychologists can gain from a few hours of psychoeducational assessment that teachers cannot gain from in-class assessments given throughout the academic year?

Jensen: One of the classroom teacher's main concerns is whether pupils are learning what is being taught in class, and for this purpose, curriculum-based assessment in its various forms is most appropriate. Psychoeducational assessment is called for when a pupil lags far behind in most scholastic subjects or has more specialized learning problems that do not respond to the teacher's tutorial intervention. Then, a clinical work-up is needed using the appropriate standardized instruments (including verbal and nonverbal tests such as are provided in the Wechsler, Stanford-Binet, and similar batteries). As in medicine, clinical diagnosis in psychology is an art, although (cont...)

* Note: Full references given at end of article for any sources mentioned in-text



it uses scientifically researched tests and psychological knowledge. The application of these tools and basing wise recommendations on their results

requires a high level of professional expertise. It is not an activity that can be routinized and carried out by technicians who are not

Tracking (homogenous ability grouping) allows more pupils to receive more relevant instruction in keeping with their rate of progress during their time in school...

well trained in educational and developmental psychology and applied psychometrics.

I should add that teachers should also notice pupils who are especially exceptional at the high end of the ability spectrum; they often need a different educational program than that offered to their more typical age-mates if they are going to get optimal benefit from their time in school. A psychologist, using standardized tests, can get a much better estimate of a pupil's standing in academic ability related to peers of his/her own age than is possible for a teacher to estimate using the more informal assessment procedures.

Beaujean: With all the knowledge there is about cognitive abilities, it seems the goal and role of education would be in the midst of a structural change. For instance, it seems as if tracking (different curriculum/classes for different capabilities) would increase and mainstreaming (lumping students of a wide variety of capabilities together) would decrease. Instead, it looks as if we are seeing the opposite. Is educational differentiation (viz. grouping similar abilities together and not having such cognitive heterogeneity in classes) more in alignment with cognitive ability research, or does the cognitive diversity

in the classroom not have much overall effect in the long run?

Jensen: It all depends on how it is done. We know that there are great individual differences in scholastic aptitude, which is highly related to g and to mental age. These differences can't be ignored. In a typical untracked classroom, by fifth grade there is about a six-year spread in grade level of aptitude and scholastic achievement. This implies a large difference in pupils' readiness for the next step in the academic aspect of the instructional program. Tracking (homogenous ability grouping) allows more pupils to receive more relevant instruction in keeping with their rate of progress during their time in school than when the teacher has to pitch the instruction mostly at just the average level of the pupils in a mainstream class, or when the teacher's attention and effort has to be divided between widely differing ability groups within the same classroom.

As an extreme example, my co-workers and I have tested many children around age 13 who would ordinarily be in the 7th or 8 grade in junior high school, but they are actually university students majoring in math and science. They are excelling in their advanced classes and receiving their B.A. degrees at about age 17. Should they have been made to go through four or five more years of secondary classes before entering college? Instruction under conditions of ability grouping should increase individual differences, although all pupils at every level of ability would benefit and perform better. What I have called "the first law of individual differences" is that anything that improves learning for everyone, and therefore raises the overall mean, also increases the variance. I have elsewhere suggested how computerized instruction can be used as an adjunct in school learning so as to individualize instruction and yet allow (cont...)



a greater spread of ability within each classroom. For more elaboration, see my chapter entitled *The g Factor and the Design of Education*.

Beaujean: Some attribution theorists in educational psychology write that if students consider intelligence a fluid (dynamic) entity, they are more likely to try harder tasks and achieve more than if they consider it static (stable), wherein they are more likely to try easier tasks they know they can do correctly. Consequently, students are often taught that intelligence is fluid (akin to the effort put into a task). Is this viewpoint diametrically opposed to cognitive ability theorists who write that intelligence is a stable entity? If so, then is a teacher who instills in his or her students that intelligence is variable tantamount to prevaricating in order to get more effort and persistence, or is this merely an artifact of using the word "intelligence" across research domains and agendas?

Jensen: There's no need to misrepresent the facts about the stability of intelligence to students or anyone else. Intelligence can be considered fluid in the sense that individuals can choose to use it in different ways. Everyone can learn, although at different rates, and pupils should know that how they spend their learning time, in or out of school, will have a lot to do with how "smart" they are in the ordinary sense of that word. Playing video games, for example, will not pay off in "smarts" as will reading a science book, working mathematical puzzles, going on a nature field trip, or practicing a musical instrument. Intellectual adventurousness is in part a learned attitude and through practice it can become habitual in almost any learning or problem situation.

I see no need or value in a child knowing his or her IQ or class standing on an abstract dimension such as psychometric *g*, no matter how

important this construct may be in psychological theory. At the same time though, children should not be kept from knowing where they stand in achievement; they know whether they did or did not put in their best effort, and they can see how much doing so has paid off in their actual performance in learning what they set themselves to learn. Moreover, they also learn what their talents and proclivities are, as well as their problem areas for intellectual accomplishment. A realistic sense of one's strengths and weaknesses is an asset in life, but it is better that these are gained through the individual's own experience than by being told where one stands on the basis of test scores that measure IQ, *g*, or other latent variables that are seldom properly understood by anyone other than the research experts who work with these theoretical concepts.

Beaujean: Despite years of psychometric research that proves contrary, there are still those who think that cognitive assessment instruments are biased, and consequently are only valid for middle-class Caucasians. As an example, a few weeks ago, I attended a lecture given by Dr. Robert Williams (creator of Ebonics and developer of the Black Intelligence Test of Cultural Homogeneity), who thinks

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racial or ethnic groups in the
United States when used for
their legitimate psychological
purpose.**

that the only way for cognitive assessment to be valid is for each ethnic/cultural group to have their own. Do you think this attack is ever going to stop? Is there anything (*cont...*)



school psychologists can do to help end this offensive?

Jensen: Yes, they should speak out against this kind of unfounded and discredited claim whenever the opportunity arises, and be armed with the facts. A panel of experts in psychometrics commissioned by the National Academy of Sciences looked into this whole issue in the early 1980's and arrived at the same conclusion that I reached in my book *Bias in Mental Testing*, namely, that the most widely used standardized tests are not psychometrically biased for any native-born, English speaking racial or ethnic groups in the United States when used for their legitimate psychological purpose. A committee of distinguished experts appointed by the American Psychological Association (APA) published the same conclusion in 1996 in the APA's house journal, *American Psychologist*.

There will always be dissenters, regardless of the evidence, just as there are Fundamentalist Creationists who still reject the scientifically established facts of evolution 150 years after Darwin, and one can even now find a few people who still argue that the earth is flat. Their evidence, like that of those today who still go on claiming that our tests are biased, is either simply lacking or it doesn't stand up to critical scrutiny.

Beaujean: Some psychology researchers and practitioners argue that cognitive ability instruments should be looked at only for their *g* score, e.g., the main score(s) on the instrument(s) (i.e., Wechsler's Full Scale IQ). Others recommend that the instruments be looked at from more of an ipsative fashion (e.g., look at a person's various scores on the subtests and compare them to each other to determine relative strengths and weaknesses). In your opinion, does the ipsative theory of interpretation hold any value, should

only the main *g* indexes be looked at, or are both position tenable?

Jensen: The ipsative use of test batteries like the Wechsler scales, the Kaufman scales, and the Stanford-Binet IV is nearly worthless. Only very large deviations in scaled scores on certain subtests from their *g*-predicted values for a given individual may indicate a special disability and should be further looked into with alternative tests. For the vast majority of subjects, profile interpretation is practically meaningless, mainly for two reasons. First, all of the subtests are more heavily loaded on *g* than on any other factor. Second, these test batteries have too few subtests to accurately represent other factors besides *g*. More specialized tests are called for when specific cognitive disabilities are suspected. For further discussion of this subject, I refer you to the considerable research on it referenced largely under the names of the leading researchers on this topic, Paul McDermott and Joseph Glutting.

Beaujean: If *g* is what psychologists should look at when interpreting traditional intelligence tests, then should we begin to abandon the much lengthier tests made up of many diverse subtests (e.g., the Wechsler series and Stanford-Binet) and instead use the shorter, higher *g*-loaded instruments (e.g., the Raven Matrices series, Test of Nonverbal Intelligence instruments, Kaufman Brief Intelligence Test) for practical cognitive ability assessment (viz. schools and clinics)?

Jensen: The *g* factor is best represented by performance on a wide variety of cognitive tests, so the total scaled score on a multi-test battery probably better represents *g* than does a test composed of a single type of item, such as the Raven, which measures the general factor plus variance that is specific to the matrices format. (*cont...*)



One value of the Raven in research is that it measures only g and its own specificity plus random measurement error. Because of its high g loading when it is factor analyzed along with the subtests in most other test batteries (and has negligible loading on any other factors), it can be used as a good screening test for general ability. A low Raven score, however, shouldn't be taken at face value because it may represent a special disability on the specificity of the matrices rather than on g per se. When used clinically or in personnel selection, the Raven is usually accompanied by a good vocabulary test (e.g., the Mill Hill Vocabulary Test), which is also very highly g loaded, but has nothing else in common with the Raven matrices. A significantly large discrepancy between the individual's standardized scores on the matrices and vocabulary tests can only be attributed to test specific factors, not to g itself.

Interactive computerized testing is the best-suited and most efficient method for solving the main problem posed by your question. This kind of computer-administered test can very quickly zero-in on the most discriminating test items for a given individual and administer some optimal number of items at that particular level of difficulty to ensure high reliability, and it can do this with a large battery of varied item types, which, in effect, "averages out" the specificity of each type of item, yielding a fair approximation to g . Of course it is axiomatic that we cannot measure g itself directly or perfectly in any given individual. We can only estimate an individual's level of g with some margin of error, depending on the number and nature of the tests that are used.

Beaujean: Some intelligence researchers have written that they believe g to be composed of independent components (as opposed

to it being a unitary construct) that all correlate highly with each other (and are products of the same elemental processes). How does this position differ from those who argue intelligence is modular (i.e., different brain regions are responsible for different activities, thus meaning there are different types of intelligence)?

Jensen: Intelligence, as you are now using this broad term, is best represented by John B. Carroll's 3-stratum hierarchical factor model, which encompasses a large variety of ability factors; some are modular, that is, they involve different regions and processes in the brain, but raw measurements of these abilities are also g loaded to some degree, as is true for all cognitive abilities, however diverse they might be. There is no incompatibility between modularity and the existence of g . Various modular abilities are positively correlated and that's why we are forced to postulate the construct of g in the first place. There are individual differences in g as there are individual differences in other ability factors, some of which have not been measured or studied sufficiently to have been entered into Carroll's 3-stratum model. This whole topic can't be properly understood without some understanding of the workings of factor analysis. It so happens that in our society some abilities are more crucial than others. g is more critical than, say, musical talent. Persons who are very low on g are generally handicapped educationally and in the world of work, but it is possible to be very low in musical aptitude and win a Nobel Prize in physics. Even with very high g though, low musical aptitude would rule out a successful career in music. High musical aptitude, however, would not result in outstanding musicianship or in a successful career as a musician in the absence of an above-average level of g . (cont...)



At the level of psychometric test scores and factor analysis, the *g* factor is unitary. At a biological and genetic level of measurement and analysis, *g* is most probably not unitary, but is related to a number of different elements, such as overall brain size, the number of cortical cells in certain regions of the brain, nerve conduction velocity, the amount of myelination of neural axons, the richness of glia, various neural transmitters, the brain's intracellular pH level, brain glucose metabolism, and other physical conditions. The biology of intelligence is still largely unexplored territory; all we know at present is that there are a number of physical features of the brain that are definitely correlated with psychometric *g*. We also know that many genes are involved in *g*; it is polygenic, as are virtually all quantitative traits. Discovering the physical basis of *g* is one of the major frontiers of neuroscience. A very recent book presenting various contemporary viewpoints on the *g* construct is *The General Factor of Intelligence: How General is It*. As research advances, my own views on *g* are constantly undergoing revision. They are most recently and most fully explained in my book *The g Factor*.

Beaujean: You mentioned genetics in your previous answer. It is a field that is growing exponentially, and it is already interweaving with psychology in that researchers are able to show how various gene combinations influence cognitive abilities and psychopathology. Some researchers who work with the statistical component of genetics (*quantitative genetics*) report that heritability contributes approximately half of the variance in cognitive abilities, while others report figures closer to three-fourths. Does this mean that $\frac{1}{2}$ to $\frac{3}{4}$ of a person's cognitive potential is already determined when the zygote forms?

Jensen: No, that is not the correct interpretation of the concept of

heritability, which is the estimated proportion of population variance in a given metric trait that is attributable to genetic variation. The reliability of the measurements in the population minus the heritability constitutes the non-genetic (or environmental) variance. The square root of the heritability can be interpreted as the correlation between the phenotypes (i.e., the measured trait, e.g., IQ) and the genotypes (i.e., the genetic underpinning). Estimates of IQ heritability (which are somewhat lower than estimates of *g* heritability) can differ widely depending on the total variance in the subject sample, the nature of the test (mainly its degree of *g* loading), and especially the age of the subjects. IQ heritability is typically around .40 in early childhood and gradually increases throughout life, reaching values around .70 in young adults and around .80 in the elderly. When the zygote is formed, an individual is genetically endowed with what geneticists refer to as a "reaction range" for the development of a given trait. This is the most probable range on the trait (e.g., an IQ in the range between, say, 100 and 115) into which the individual will develop when brought up in the typical environment (or "natural habitat") of the population (or species). The IQ, or *g* level per se, is more subject to genetic influence than most personality traits, but is less genetically influenced than most physical traits.

Beaujean: As you mentioned, quantitative geneticists write that the environmental affects on a person's cognitive ability decrease (and genetic influences increase) as a person grows older. This would seem to have a major impact on education, but seldom is this discussed in teacher training programs. Does this mean that student progress in school should get more disparate as they matriculate because the school itself (e.g., environment) will have less and less of an impact on (cont...)



students' capabilities and, subsequently, their achievement?

Jensen: Yes, you've stated the phenomenon very well. With increasing age, genotypic tendencies progressively unfold, so to speak, and environmental influences have a diminishing influence. Individual differences (population variance) increase with age. Children who differ relatively little in scholastic aptitude and achievement in the early grades, for example, may differ three to four times as much on these variables by the time they graduate from high school. Between early childhood and maturity, the relative standing of individuals in abilities and achievements become increasingly stabilized. At present, we simply have to live with the reality of fairly stable individual differences in mental abilities, particularly their common factor, g .

Beaujean: The human genome has been sequenced, and DNA sequencing for each chromosome is making strong headway. Moreover, researchers are now looking at specific genes and quantitative trait loci (QTL) involved with the heritability of cognitive abilities. In the not too distant future then, we should know most, if not all, the specific genes that affect g . This is obviously going to have an affect on psychology. What are the implications you see with having this knowledge?

Jensen: I hope our grandchildren might be able to answer this question when they are my age. I doubt that we will have the whole g -factor of the human genome in our grasp in the near future. It is proving to be a much more technologically difficult task than was imagined just a few years ago. From the well established high heritability of intelligence (g), we know that the genes for g are there, but finding each one (and we don't know how many there are) is like looking for needles in a

haystack. They are likely not all on a single chromosome, or even located in proximity to one another on a given chromosome. The genes (or sections of

Children who differ relatively little in scholastic aptitude and achievement in the early grades, for example, may differ three to four times as much on these variables by the time they graduate from high school.

DNA) with the largest effects on g may be relatively few and will be easier to discover. Establishing the identity and loci of just these will be a great

scientific achievement. To the extent that epistasis (the interaction among genes at different loci) may play an important part in g will make the task more difficult. That is, individual differences at the behavioral level may depend on particular combinations of genes rather than on a simple summation of so many plus and minus genes for g . If that is the case, the practical implications of discovering genes for g would be much more problematic if anyone wishes to manipulate the genome to enhance an individual's level of g . Single-gene defects will be easier to identify and remedy than the polygenes that affect intelligence in the normal range of variation. At present, the science has yet to catch up with the speculations, hopes, and fears that abound in this realm.

Beaujean: Some psychologists have written that, on the average, there are significant differences in IQ scores between races/ethnicities--differences that are both valid and reliable. As far as you know, is the pattern and degree of difference still holding, or are groups adapting/evolving and drawing more similar through successive generations of assortative mating practices? (cont...)



Jensen: I haven't found any valid evidence of a change in the average difference in IQ of different racial groups, particularly of Blacks and Whites in the United States, since IQ tests were first used on a large scale, some 80 years ago. The mean Black-White difference is still about 15 IQ points on tests now in use, although the size of this difference can be reduced somewhat by decreasing the tests' *g* loadings, since most of the difference is on the *g* factor, rather than any other factors independent of *g*. We know that *g* has a large genetic component, and, if anything, there is likely a trend, not yet visible at the phenotypic level, for the mean Black-White difference in *g* to be gradually increasing. U.S. Census data show that the birthrate in the Black population, regardless of marital status, is highest for those women with the least education and lowest for Black women who have gone to college, and that this trend is greater than in the White population. Since number of years of education is correlated with IQ, this implies that in each generation relatively more Black children are born to mothers of lower IQ than to mothers of higher IQ. If such a trend continues, it could result in an increasing IQ difference between the Black and White populations, because we know there is

a correlation of about +.50 between mothers' IQ and children's IQ. You mentioned assortative mating, but it has no direct effect on the population mean, although it increases the variance, i.e., it results in more individuals being

Chronometric measures are extremely more sensitive than ordinary tests and therefore lend themselves to observing subtle changes in mental activity as a function of physiological state and other conditions.

in the top and bottom ends of the total distribution of the population. By way of differential birth rates in the high and low segments of the bell curve, this can affect the overall mean of the distribution, pushing it either up or down.

Beaujean: Should these patterns that exist between race/ethnicity and cognitive abilities affect education policy? If so, then what impact should the relationship have? If not, then should education (as a whole) really care about these patterns?

Jensen: The mission of education is directed at individuals; it is not intended to change a society's demographics. It is the individual who is the recipient of instruction in school, and I can see no reason that we shouldn't treat every pupil in terms of the pupil's own abilities and characteristics regardless of race, ethnicity, or any other kind of group classification. Group means are simply aggregated individual differences. My research indicates that the relationship between scholastic performance and *g*, or any other cognitive abilities, is the same for Blacks and Whites--and probably for other racial groups as well.

On the basis of what I have learned from my research, I would be very opposed to a teacher or school psychologist who treated individuals differently just because of their race or any other group membership. As far as educational aptitude is concerned, every Black child has his or her counterpart in the White population, and vice versa.

The same can be said of the Asian and Hispanic populations. The fact that there are differences between group means is altogether another issue.

Even if there were no differences between group means, the schools would still have to deal with the wide range of individual differences.

(cont...)



Beaujean: Changing gears a little, in the sciences, measurement is usually on an interval or ratio scale, which is imperative in comparison and longitudinal studies. This is not so with cognitive assessment. At best, it would be interval $\pm 1\sigma$ from the mean, and ordinal past that. This can pose problems both in research and in practice. Can mental chronometry offer a way out of this dilemma? If so, is it possible that someday it could replace the paper-and-pencil cognitive assessment instruments currently used—in other words, will mental chronometry ever be able to offer an ratio “IQ” measure across capabilities?

Jensen: The idea that IQ is on an interval scale, even in the middle range of IQ, is much more an act of faith than it is a proven fact. If we assume that IQ should be normally distributed and construct a scale of IQ that has a normal or Gaussian distribution in a random sample of the population, we then can say that IQ is measured on an interval scale. This merely confirms our initial assumption, though—it can't prove it. It is best to realize that our conventional psychometric tests, however well constructed and standardized, are only ordinal (rank order) scales, rather than true measurement. Chronometric tests, on the other hand, measure in units of time—seconds or milliseconds—and this constitutes true measurement on an absolute or ratio scale, aligning psychological measurements with those in the natural sciences. There are great advantages of such a scale for the scientific development of psychology. The advantages are somewhat less for applied psychology, as in educational or employment selection, where ranking people for some aptitude or skill may be all that matters to the test users.

There are whole classes of questions that cannot be answered with less than a ratio scale. For example, we

cannot answer whether people are more variable in intelligence than in, say, height, whereas we can definitely say how much more variable in height people are than in weight (or vice versa). The variance ratio ($VR = SD/Mean$) is a meaningless number when applied to psychological measurements; however, it is an entirely meaningful ratio when applied to time or any other physical measurement. We now know that the response times (RT) on a variety of elementary cognitive tasks (ECTs) are correlated with psychometric measure of ability. This means we can measure these same abilities on a true scale, although at present this involves using quite special laboratory equipment and longer testing time than administering traditional scales (e.g., the Wechsler). The research on RT has seldom been directed at using it to replace conventional tests. Instead, it has been used to answer other kinds of research questions in experimental cognitive psychology. When research in mental chronometry becomes focused specifically on the measurement of individual differences in cognitive abilities, I believe we will see rapid progress in replacing conventional tests with chronometric tests in clinical use. The tests we have today will still have practical uses where ratio scale properties are not of any particular importance. My book-in-progress on mental chronometry spells out all of its advantages in research on individual differences in mental development, cognitive aging, special disabilities, drug effects, and various pathological conditions. Chronometric measures are extremely more sensitive than ordinary tests and therefore lend themselves to observing subtle changes in mental activity as a function of physiological state and other conditions. For example, RT fluctuates systematically with slight changes in body temperature throughout the diurnal cycle. (cont...)



Additionally, the same test can be given many times without impairing its reliability or validity in the least and can be used over a very wide age range, from early childhood to very old age, and the "scores" (i.e., units of time) are the same throughout the whole age range. No psychometric test has these desirable properties. [See the last question for more information on Jensen's new mental chronometry book.]

Beaujean: Because the basis of mental chronometry is elementary cognitive tasks (ECT) instead of a complex array of cognitive tasks (like most intelligence tests), are we closer (or have the capability to be closer) to understanding the basic neurological processes that underlie cognition? In other words, does mental chronometry allow us to see what parts of the brain function (via fMRI, CAT scan, etc.) during the elementary tasks, and thus allow us to better understand how the brain works as a whole during cognition?

Jensen: I believe that mental chronometry will provide this advantage that you describe, but it has not yet been demonstrated, as far as I know. It seems likely that ECTs have a much sharper focus in brain functions than do complex psychometric tests, which typically involve more or less simultaneous activation of a number of different brain processes. Also, chronometric measures, besides their narrow focus on relatively few processes, can be repeated over and over, allowing the investigator to obtain any degree of reliability needed for measuring a given ECT variable. This enhances its possible correlation with the particular brain mechanisms that can be localized via fMRI, PET scan, or other imaging techniques.

Localization of cognitive functions is probably less than half the story though. The crucial part of the

story, from the standpoint of differential psychology, is the source of individual differences in a given cognitive function even if it is localized in the approximately the same area for all individuals. Then one would have to test hypotheses regarding that pin-pointed area, such as neuronal density, degree of myelination of the axons, supporting glial cells, chemical neurotransmitters, and so forth. Chronometric ECTs, I believe, offer a greater possibility of zeroing-in on the physical sources of individual differences in cognitive processes than can be obtained with conventional psychometric tests. It is this belief, or hope, that motivates my interest in mental chronometry.

Beaujean: You wrote earlier that you are authoring a new book on Mental Chronometry. I am wondering if you could give us a brief description of what we can anticipate, and when we can anticipate it?

Jensen: Mental chronometry (MC) is the measurement of the time taken to process the information in a relatively simple stimulus. The speed of information processing has many psychological and physical correlates, one of the most prominent being psychometric g . In my own chronometric lab, we have been interested in the time taken by cognitive tasks that can be performed in less than 2 or 3 seconds, and some tasks have a response time (RT) of less than one second for every person in the study. Yet there are highly reliable individual differences, even among bright university students concentrated in the upper quartile of the IQ distribution. RT is always measured in milliseconds. The tasks are so simple that error rates are close to zero for all subjects. The only reliable measure of individual differences in our MC research are those based on units of time. (*cont...*)



MC has several important advantages over ordinary psychometric tests. One is that RT is a ratio scale; this allows answers to a number of important research questions that cannot be answered with just interval or ordinal scales. The elementary cognitive tasks (ECTs) used in this research can be administered over a very wide age range, which makes them ideal for studies of mental development from early childhood to maturity, and the same ECTs can be used to study cognitive aging. We have data on the very same ECTs on groups spanning the age range from 3 to 88 years, allowing one to observe changes in the speed of information processing across almost the whole life span. Some ECTs are designed to measure the speed of retrieval of information from short-term memory and from long-term memory.

Another advantage is that the same task can be used for repeated testing on the same subject and one can give as many trials or testing sessions as are needed to achieve a specified level of reliability; the number of RT needed to obtain any required reliability coefficient is accurately predicted by the Spearman-Brown formula. Also, RT measures are exceedingly sensitive to physiological and psychological conditions, far beyond anything possible with conventional tests. Pharmaceutical research has an interest in MC because it can monitor the subtle effects of various drugs. A baseline level of RT can be established for a person under non-medicated conditions, and then changes in RT can be measured under different dosages of a drug. There are many drugs intended only for physical ailments that have subtle psychological side-effects, and these can be detected and monitored by means of MC. In brain research using imaging techniques (fMRI and PET scan, for example) we need tasks and performance measures that can zero-in on very specific cognitive functions and this can be done

with MC techniques. My book will cover all of this and much more. MC is a highly specialized field and much is going on in it at present, but as yet not many psychologists fully appreciate its significance and potential for research on the brain correlates of cognitive processes. It would be unwise for me at this time to predict when my book on MC will be finished (is about half written at present), but so far I have always completed and published every book I had decided to write. The writing itself is the easy part. It's the preparation and thinking that take time. Ψ

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The Third Annual Conference of the International Society for Intelligence Research (ISIR) – December 5, 6, and 7, 2002

When: December 5, 6 and 7, 2002. See below for a bonus symposium organized by the Kennedy Center on December 4, 2002. This year's conference will include a banquet on the evening of December 6. For those interested, a limited number of tickets are available for the Grand Ole Opry in the "Golden Circle" of the Ryman Auditorium (<http://www.ryman.com/>), an historical landmark and, for a time, the home of the Opry, for the night of December 7th. The show is 2.5 hours long and will include 18 to 25 acts. Seats are in the front rows of the lower level. Tickets, including transportation to and from the auditorium, are \$50. First come first served. Please e-mail dkd2@po.cwru.edu if you wish to reserve one or more tickets.

Where: The 2002 ISIR conference will be held at Vanderbilt University, Nashville, TN. The conference will be hosted by the Kennedy Center for Research on Human Development of Vanderbilt University. The primary hotel for the conference is the Holiday Inn Select, Vanderbilt, 2613 West End Ave., Nashville, TN 37203. A block of rooms will be held until November 4, but since there are a small number of rooms at this special rate, you should make your reservations as soon as possible. The rate is \$82.00 per night. To make reservations call 800-633-4427 in the US, 615-327-4707 from anywhere (between 8AM and 7PM CST= -6 GMT), fax 615-320-4850, or email bspencer@bristolhotels.com.

Why: ISIR was founded in 2000 as a scientific society for researchers interested in human intelligence. Every member receives a subscription to the journal, *Intelligence*. This conference offers an opportunity for those interested in intelligence to meet, present their research, and discuss current issues.

Invited Speakers: The invited speakers for the conference will be **Robert J. Sternberg** (Converging Operations in the Construct Validation of the Theory of Successful Intelligence), **Arthur Jensen** (The Crucial Importance of Mental Chronometry for the Science of Mental Abilities), and a third speaker to be announced.

How to submit papers for the conference: Papers for the conference may address any area of human intelligence. Accepted papers will normally receive 15-20



minutes of program time. To have your paper considered for the program, submit a **one page abstract no later than October 15, 2002**. By email (preferred), submit abstract to dkd2@po.cwru.edu as an MS-Word or plain text attachment. By regular mail, submit two copies of abstract and include an IBM formatted diskette with MS-Word or plain text copy of abstract. Send to D. K. Detterman, Department of Psychology, Case Western Reserve University, Cleveland, OH 44106. In all submissions, include title, authors, affiliations, e-mail address, and abstract. Abstracts should be **no more than one page** of 12-point type. Indicate e-mail or regular address where correspondence is to be sent. Symposia are encouraged. All abstracts (one for each presentation and an overall summary) in a symposium should be submitted by the organizer at one time. Abstracts and symposia submitted for consideration will be reviewed as they are received. Program time will be allotted to presenters on a “first come, first served” basis. An overhead will be available for presentations. An LCD projector will be available but is not guaranteed to work with your computer. Overheads should be available as backup.

Conference Registration: Advanced registration for conference attendance is due by October 15, 2002. Please register in advance to be sure to have a place reserved at the banquet. Checks should be made payable to Intelligence-CWRU and be denominated in \$US. Credit cards are also acceptable (MC, Visa only). Send registration to the same address as abstracts. Registration fees (in \$US) are as follows:

Status	ISIR Status	Advanced Registration	On Site Registration
Faculty and Postdocs	ISIR Member	\$120	\$135
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Student	ISIR Member	\$50	\$65
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Bonus Symposium: The Kennedy Center has organized a one-day symposium on “The Futures of Intellectual Assessment and Psychometrics” that will be presented on December 4, 2002 at no extra cost to registrants for ISIR. Directors for this symposium are H. Carl Haywood and David Lubinski. Presenters will be: Phillip L. Ackerman, Issac Bejar, Douglas K. Detterman, Linda S. Gottfredson, Earl B. Hunt, Mark Wilson, Ian Deary, Susan Embretson, H. Carl Haywood, Theodore D. Wachs, and Richard W. Woodcock. Discussants will be: Thomas J. Bouchard, Jr., Lynn Fuchs, David Lubinski, Robert J. Sternberg, Douglas Fuchs, Arthur R. Jensen, Julian C. Stanley, and Niels G. Waller. We would like to thank the John F. Kennedy Center for Research on Human Development, Vanderbilt University for their generous support of this symposium.

Check List: Make hotel reservations as soon as possible. Reserve Opry tickets as soon as possible. Make travel arrangements. Pre-register for conference by October 15th. Submit paper or symposium by October 15th. **For additional information, contact D. K. Detterman, Department of Psychology, Case Western Reserve University, Cleveland, OH 44106. Fax: 216-368-4891. e-mail: dkd2@po.cwru.edu**



Uniqueness in information processing

Review of: Levine, M. (2002). *A mind at a time*. New York: Simon & Schuster

**A. Alexander Beaujean,
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In his new book, *A Mind at a Time*, Mel Levine, pediatrician, founder of the All Kinds of Minds Institute, and director of the University of North Carolina's Clinical Center for Development and Learning, gives his take on what makes children unique. Although Levine tends to be sympathetic to the ever popular multiple intelligences philosophy, his descriptions of individual variance follow a more information-processing model. Beginning with Attention Control and systematically working through Memory and the various Output channels of the human mind, Dr. Levine makes a very good case for how to look at many of the common "disorders" child professionals see in their clientele. His book was written for the laity, so he uses case studies as his point-of-reference and cites no peer-reviewed research or data to support his ideas; nonetheless, the scientist-practitioner can still find use for this book as a good set of hypotheses for possible peculiarities in the human information processing system.

The biggest contribution this book makes is its take on attention disorders. While trained as a physician, Levine has a medicine-as-a-last-resort stance for attention difficulties and, instead, advocates finding the etiology via the processes

of the mind that attend to soon-to-be-processed information (e.g., mental energy, intake, and output controls). It is beyond the scope of this review to go into explicit detail about Levine's theories, but for anyone who frequently encounters attention problems in his/her research participants or clinical clientele, it would be worth the time to read his hypotheses. His thoughts on what breaks down in the attention component of the information-processing system, and his subsequent set of remediations for each breakdown, give some worthy fodder for cogitation.

The next chapter deals with the memory component of information processing. As with his chapter on attention, Levine puts forth some very interesting ideas about how breakdowns in the human memory system (short term, working, and long term) can affect a host of other systems. What is particularly good about this chapter is his emphasis on the interweaving of memory and attention. While they are theoretically separate systems, they use, and are reliant upon, each other's performance. His ideas for remediation are not particularly novel (they could be found in most books on learning), but since this is one of the most researched areas in experimental psychology, one does not expect much innovation.

Levine's next five chapters revolve around various outputs of the information processing system: language, spatial and sequential ordering, motor, higher thinking, and social thinking. In these chapters, he does an admirable job of interlacing the first two (*cont...*)



information-processing components (attention and memory) with various outputs. Obviously, these outputs require special inputs, and Levine goes into various breakdowns in the different stages.

What are of most value in these chapters are the various remediations he suggests for specific breakdowns. While he has his "favorite" breakdowns, and subsequently gives more concentration to their explanation and remediation techniques, he does a decent job all the way around giving practical procedures to implement when there is a deficit at some point in an information-processing component.

The next two chapters will be of interest to many school psychologists because they focus specifically on assessment and intervention. Levine's most cogent point in these chapters is that being fair is not synonymous to being equal. He relates that some teachers will not allow, or allow grudgingly, the accommodations some children need in the name of being fair to the other children in the class. One of his solutions is rather interesting, and one that future school psychologists should give some thought. He suggests that students who need accommodations should receive them, but in return they need "pay the teacher back" for the accommodation. The example he gives is a child with a numerical processing problem and is given a test with only 8 mathematical problems instead of a test with 10 problems that his peers have to complete. In response to getting a few problems taken off of his tests,

the teacher should require payback in the form of 2 additional problems on the evening's homework assignment. In other words, just because a child has special needs does not mean he/she should be accountable for less work.

In these chapters, Levine makes a special point of stating that parents and child-professionals should be more concerned with the *how* of the disorder instead of the *why*. In other words, diagnosis and remediation/accommodation should be the primary areas of importance, and tracing the etiology should not be given too much thought. While this might hold weight for parents trying to assign causation for their child's malady, it is a call that needs to be ignored for the scientist-practitioner. Ultimately, cessation of a difficulty resides in the detection of its etiology and subsequent pre-manifestation rectification.

In his penultimate chapter, Levine advocates for teachers and parents to work symbiotically, applying interventions in both the school and the home. For instance, if a child has trouble with intake control (attention) and has trouble perceiving main ideas in large masses of information, he/she should have to practice summarizing and finding gists in school readings and should be required to do similar activities at home (e.g., summarize plots of television shows). In addition to parents and teachers working together, Levine believes that a key to helping a student overcome his/her processing difficulty is to use the child's affinities. For example, if a child has trouble decoding text, but (*cont...*)



loves to learn about dinosaurs, then the child's parents and teachers should make sure the child has access to many books about dinosaurs. The theory being that because the child will be interested in the content, he/she will practice his/her decoding skills (although probably not consciously) while struggling through the readings about dinosaurs; subsequently, the child will strengthen his/her decoding skills. His chapter's positive tone about home-school educational interactions is especially sound in lieu of an educational zeitgeist that sometimes promotes schools as the only places children can learn and teachers as the only people who can instruct.

In Levine's last chapter, he writes about how he thinks the American educational system should be reformed. He takes a relatively naïve outlook that may sound nice, but probably would not hold up very well were it ever implemented. For example, he advocates that every student should be able to take an advanced placement (AP) class and think of him/herself as an honor student. This sounds nice and may even give off some warm fuzzies, but the point of the Honor Roll and AP systems are to reward those students who attain a certain threshold of achievement, so if everyone were to take AP classes or be on the honor roll, then the point of having them would be diminished. As another example, he advocates having a managerial track in schools for students who love sports, but lack athletic talent. Again, this may sound open-minded, but in reality, how could someone coach a sport

when he/she has never played the game at the level he/she is coaching? I doubt there would be too many advocates of allowing someone to teach high school physics who never took physics in high school and college, so why should this standard be applicable elsewhere? Ultimately, this chapter amounts to little more than Dr. Levine's soapbox on education, and it is a poor ending to a relatively good book.

Conclusion

Dr. Mel Levine's new book takes a look how children differ in the way they processes information. Written for the laity, he gives many anecdotes and no data, which makes fascinating reading, but poor science. Covering cognitive issues that range from input to memory to output and the various real-life ways abnormalities in these processes can play out, Levine does a good job in relating what can possibly happen when various parts of the information-processing system breakdown. His pool of assessment, intervention, and accommodation techniques are interesting and might be worth a try in appropriate circumstances. While he takes a rather naïve medical-model perspective that all students can achieve equally given the proper diagnosis and accommodations, this tome can be a valuable asset to the school psychologist in that it gives him/her a resource to give to parents who have children with problems in their information processing system. Further, the book can serve an amalgam of theories of why a child is not functioning at his/her peak. Although not a must have, it defiantly makes for interesting (*cont...*)



reading and could be a beneficial resource for a school psychologist's professional library. Ψ

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