

## IQ and Intelligence Seminar

**Spring 2012**

**Time:** Tuesday 2:00-3:50

**Location:** Straub 143

**Instructor:** Nash Unsworth

**Office:** Straub 321

**Contact:** nashu@uoregon.edu

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**OPTIONAL TEXT:** *IQ and Human Intelligence* by Nicholas J Mackintosh (2011) 2<sup>nd</sup> Edition

### **COURSE DESCRIPTION**

In this seminar, we will examine variation in intelligence and IQ. Topics will include intelligence tests, psychometric, cognitive, and neural theories of intelligence, developmental changes in intelligence, group differences in intelligence, as well as validity of intelligence tests.

We follow a seminar format, so we learn from each other. That means you need to come to class. You need to speak up, ask questions, provide answers or indicate confusion (no shame in that!). You also will lead a discussion of a topic or paper. You will also write a final paper which is a research proposal.

### **HOW TO USE THIS SYLLABUS**

This syllabus contains most of the information that you need for understanding how the course is organized. I will not take up your time by going over all of the material in the syllabus in class. You should read the syllabus and make sure that you understand it. If you have a question, first check the material in the syllabus and if you still need information, by all means ask.

### **COMPONENTS OF THE COURSE GRADE**

**Discussion Lead:** Students will be required to lead the discussion on papers throughout the semester. The discussion of each article will be led by one student. That student is responsible for a clear, concise (10-12 min) presentation of the article, including the critical questions asked, the methods, *the findings* and the conclusions. You will also tell us your take on the paper, and provide a few questions to discuss. To do this well, the leader may need to read an additional article or two. Doing a good job in leading a discussion requires that you (a) understand the paper and its issues and findings and (b) use your own words to describe the paper.

**Final Paper:** Each student will write a final paper of no more than 15 pages (1 inch margins, doubled spaced, 11-12 pt font, excluding references) on a topic of your choice closely related to IQ and intelligence due on May 31. The paper should culminate in a proposal for an experiment that could be conducted on this topic. As a model, I would recommend organization similar to the Introduction section in a Journal of Experimental Psychology article. Your experiment should be tractable and concrete. You do not need to include a complete Methods section. Primary source material for your paper must be peer review journals from some area of experimental psychology. There must be a minimum of 10 such references. Books, tech reports, and other sources are acceptable but are not a substitute for peer reviewed research and these do not count towards the minimum references required. Please be aware that it is inappropriate to cite papers that you have not actually read. If you wish to refer to sources that you have not directly accessed, you should refer to it "as cited in ...".

If you have never written a research paper of this type, I also strongly recommend speaking with me soon.

### **GRADING BREAKDOWN:**

- 50% will be based on the final paper
- 25% leading discussion of papers
- 25% will be based on class participation

**Total = 100%**

A straight grading scale is the default (e.g., 90-100=A, 80-89=B, 70-79=C, 60-69=D, 59 or lower=F). However, I reserve the right to adjust the grades up depending on the distribution of scores (i.e., curve). Grades will never be adjusted downward. Those taking the class Pass/Fail must obtain a "C" to pass.

**Criteria used in making grading decisions:**

- I will usually round up, for example from 79.5% to 80%, but do not count on it (sometimes the tests may have been extra easy, for example—then the cutoffs will be firm).
- **As a general principle, I will never work harder for your grade than you do.** Students who have poor attendance should not expect me to “make up” points for them. Students who have done all that is in their power to do their best can be assured that will be carefully considered in making any borderline decision. I try to apply consistent standards and treat students fairly, as well as fulfill my responsibilities to UO in making difficult decisions about grades.

**Grading problems:** If you feel there has been an error in working out your grade please let me know as soon as possible. Work out your grade as described above and specify the reason for your concern when contacting me. I want you to get every point you have earned. If you are unhappy with your final grade but agree that it has been worked out correctly as described above, please don't ask for a better grade, or extra opportunities to make a better grade, as a "favor" at the end of the semester. The answer to such unfair requests must always be "no".

**Schedule of Topics and Readings\*\***

<b><u>Tentative Date</u></b>	<b><u>Topic</u></b>
Week 1 4/3	Introduction to Class
Week 2 4/10	History and Intelligence Tests
Week 3 4/17	Factor Analysis and Psychometric Theories
Week 4 4/24	Cognitive Mechanisms
Week 5 5/1	Intelligence and the Brain
Week 6 5/8	Development and Aging of Intelligence
Week 7 5/15	Genes and Environmental Influences
Week 8 5/22	Predictive Validity of Intelligence
Week 9 5/29	Group Differences in Intelligence
Week 10 6/5	Changes in Intelligence

**\*\*All readings, and assignments dates are tentative and subject to change. Any revisions to this syllabus will be announced during class time. It is your responsibility to make a note of any changes in this syllabus.**

## Readings

### Week 2

Galton, F. (1869). Classification of men according to their natural gifts. *Heredity Genius: An Inquiry into its Laws and Consequences*.

Binet, A., & Simon T. (1905-1908). The development of intelligence in children.

### Week 3

Spearman, C. (1904). "General intelligence," objectively determined and measured. *American Journal of Psychology*, 15, 201-293.

Thurstone, L.L. (1948). Psychological implications of factor analysis. *American Psychologist*, 3, 402-408.

Cattell, R.B. (1957). Fluid and crystallized intelligence. *Personality and Motivation Structure and Measurement*, pp 871-880.

McGrew, K. (2009). CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of the psychometric intelligence research. *Intelligence*, 37, 1-10.

### Week 4

Engle, Tuholski, Laughlin & Conway (1999). Working memory, short-term memory and general fluid intelligence: A latent variable approach. *Journal of Experimental Psychology: General*, 128, 309-331.

Larson, G. E., & Alderton, D. L. (1990). Reaction time variability and intelligence: A “worst performance” analysis of individual differences. *Intelligence*, 14, 309–325.

Unsworth, N., & Spillers, G.J. (2010). Working memory capacity: Attention, Memory, or Both? A direct test of the dual-component model. *Journal of Memory and Language*, 62, 392-406.

### Week 5

Colom, R., Haier, R.J., Head, K., Álvarez-Linera, J., Quiroga, M<sup>a</sup>A., Shih, P.C. & Jung, R.E. (2009). Gray matter correlates of fluid, crystallized, and spatial intelligence: Testing the P-FIT model. *Intelligence*, 124-135.

Christoff, K., Prabhakaran, V., Dorfman, J., Zhao, Z., Kroger, J.K., Holyoak, K.J. and Gabrieli, J.D.E. (2001). Rostrolateral prefrontal cortex involvement in relational integration during reasoning. *NeuroImage* 14(5), 1136-1149.

Duncan, J. Seitz, R.J., Kolodny, J., et al. (2000) A neuralbasis for General Intelligence, *Science*, 289, 457-460

**Week 6**

Fry, A. F., & Hale, S. (1996). Processing speed, working memory, and fluid intelligence: Evidence for a developmental cascade. *Psychological Science*, 7, 237–241.

Schaie, W.K. (1994). The course of adult intellectual development. *American Psychologist*, 49, 304–313.

Salthouse, T.A. (2006). Mental Exercise and mental aging: Evaluating the validity of the use it or lose it hypothesis. *Perspectives on Psychological Science*, 1, 68–87.

**Week 7**

Bouchard, T.J., et al. (1990). Sources of human psychological differences: The Minnesota Study of Twins Reared apart. *Science*, 250, 223–228.

Plomin, R., et al. (1997). Nature, nurture, and cognitive development from 1 to 16 years: A parent-offspring adoption study. *Psychological Science*, 8, 442–447.

Petrill, S.A., et al. (1998). The genetic and environmental relationship between general and specific cognitive abilities in twins age 80 and older. *Psychological Science*, 9, 183–189.

**Week 8**

Deary, I.J., et al. (2007). Intelligence and educational achievement. *Intelligence*, 35, 13–21.

Schmidt, F.L., & Hunter, J.E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124, 262–274.

Lubinski, D., et al. (2006). Tracking exceptional human capital over two decades. *Psychological Science*, 17, 194–199.

**Week 9**

Steele, C.M., & Aronson, J. (1995). Stereotype threat and intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797–811.

Fagan, J.F., & Holland, C.R. (2007). Racial equality in intelligence: Predictions from a theory of intelligence as processing. *Intelligence*, 35, 319–334.

Deary, I.J., et al. (2007). Brother-sister differences in the g factor in intelligence: Analysis of full, opposite-sex siblings from the NLSY 1979. *Intelligence*, 35, 451–456.

**Week 10**

Flynn, J.R. Massive IQ gains in 14 nations: What IQ tests really measure. *Psychological Bulletin*, 101, 171–191.

Jaeggi, S.M., Buschkuhl, M., Jonides, J., & Perrig, W.J. (2008). Improving fluid intelligence with training on working memory. *Proceedings of the National Academy of Sciences of the United States of America*, 105(19), 6829–6833.

Campbell, F.A., et al. (2002). Early childhood education: Young adult outcomes from the Abecedarian project. *Applied Developmental Science*, 6, 42–57.