

Psychology 4010/6017
Human Abilities
Fall, 2016
Mondays, 4:05 - 6:55 p.m., Room 250 J.S. Coon Building

Instructor: Prof. P. L. Ackerman

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Prerequisites:

Undergraduate: Psychology 2020

Graduate: Graduate status

Course Description:

Theory, methods and applications of research in human abilities. Topics include intelligence, aptitude, achievement, specific abilities, information processing/learning and intelligence, aptitude/treatment interactions, and quantitative measurement issues.

Required Texts:

Cronbach, L. J. (1990). *Essentials of psychological testing, 5th Edition*. New York: Harper & Row.

Kim, J., & Mueller, C. W. (1978). *Introduction to factor analysis: What it is and how to do it*. Beverly Hills, CA: Sage.

Additional Readings [availability to be arranged on the first day of class]

General Course Information and Requirements:

Class meetings will primarily be devoted to lectures by the instructor. Students are encouraged to ask questions and take part in discussion during regular class periods. A midterm exam and a cumulative final exam will be given. Also, one term paper will be required from each class member.

Course Grading:

Your grade for the course will be determined as follows:

	<i>Weight</i>
Mid Term Exam	30%
Term Paper	25%
Final Exam	45%

Term Paper:

One of the important goals of this advanced course in human abilities is to be able to critically evaluate historical arguments and current theoretical/empirical research. Critical treatment of such issues depends on developing competence in evaluating the theoretical and methodological adequacy of journal articles and book chapters. The term paper will require you to critically evaluate research discussed in the course readings and additional readings.

Term Paper:

The term paper is due at the beginning of class, on the last day of class, **December 5, 2016**, will allow some freedom in the choice of topics. Any substantive (not solely statistical) topic from the class may be considered. The assignment is to choose a controversial issue from those discussed in the course lecture and readings (i.e., there must be at least two competing perspectives on the issue) and **critically evaluate the controversy**. The evaluation should focus on the strength of the theoretical arguments and empirical support for each position. The paper are to be based mainly on **primary** literature (e.g., empirical and theoretical journal articles), and not on secondary sources (e.g., books, chapters, review articles). The final product is to include your own conclusions and a clear justification for your position. **[Target length: 12 pages + references]**

References are to be cited using APA style. (For such information, you should consult the following reference: *Publication Manual of the American Psychological Association: 6th Edition*. (2009). Washington, DC: APA.) Although papers will not specifically be graded on the basis of grammar or spelling, poorly written papers are very difficult to read; it is often hard to see good ideas in a jumble of misspelled words, with stream-of-consciousness writing, and so on. Therefore, it is important to pay attention to style in addition to content in the preparation of your paper. **LATE TERM PAPERS WILL BE DOCKED 5 POINTS FOR EACH DAY LATE.**

MEETING TOPICS AND ASSIGNMENTS

Meeting Date	Topic	Assignment
8/22	Overview and History of Human Abilities Galton, Cattell, Binet . . .	Cronbach Chs. 1,2
	Methodology I. Theory and Method. A review of test theory	Cronbach Chs. 5,6

Meeting Date	Topic	Assignment
8/29	Methodology I. Continued	
a.	Reliability/Validity	
b.	Bandwidth/Fidelity Paradox	
	Methodology II. Factor Analysis Techniques	Kim & Mueller (1978)
a.	The data foundation	Cronbach Ch. 10
b.	Various procedures (factor extraction, rotation, model-testing, etc.)	
9/5	<i>Official School Holiday -- No class</i>	
9/12	Completion of Factor Analysis	
	Test Construction and Measurement Issues.	Cronbach Chs. 7,8
a.	Individual Measures (Stanford-Binet, WAIS, etc.)	
b.	Group Measures	
c.	"Culture-free" vs. Culture-Loaded tests	
9/19	Models and Theories of Abilities (Factor Analysis, Multiple Factors)	Wofle (1940)
a.	Spearman	Guilford (1956)
b.	Thurstone	McNemar (1964)
c.	Guilford	
9/26	Modern Models and Theories of Abilities (Hierarchical Factors)	
a.	Cattell & Horn	Horn & Cattell (1966); Horn (1968)
b.	Humphreys	Humphreys (1979)
c.	Cattell-Horn-Carroll	Schneider & McGrew (2012)
10/3	Specific Abilities	
a.	Intelligence, Aptitude, & Achievement	Humphreys (1973)
b.		Lohman (2006)
c.	Verbal vs. Non-Verbal Abilities	Lohman & Lakin (2011)
d.	Typical & Maximal Performance	Ackerman (1994)
10/10	<i>Fall Recess - No class</i>	
10/17	Midterm Examination	

Meeting Date	Topic	Assignment
10/24	Information Processing Abilities (including Working Memory)	
a.	Basic Processes	Deary (2000)
b.	Sternberg	Sternberg (1985)
c.	Working Memory	Yuan et al. (2006)
10/31	Development and Stability	
a.	Measurement of Change	Lord (1963)
c.	Life-Span Approaches	Schaie & Strother (1968) Reinert (1970) Ackerman (1996)
11/7	Trait complexes -- Personality, Interests, and Intelligence	Lubinski (2000) Ackerman & Heggestad (1997) Ackerman (2000) Ackerman, Chamorro-Premuzic & Furnham (2011)
11/14	Specific Learning & Intelligence	
a.	Ferguson	Ferguson (1954)
b.	Fleishman	Fleishman (1972)
c.	Learning Abilities	Ackerman (1987, 2007)
d.	Expertise	Hambrick et al. (2016)
11/21	Aptitude - Treatment Interactions	
a.	Theory -- Cronbach	Cronbach (1957, 1975)
b.	Cronbach & Snow	Snow (1989, 1996)
11/28	Gender, Race, & Ethnic Group Differences.	
a.	Magnitude and source of differences	Hyde (1981)
b.	Theory	Miller & Halpern (2014)
12/5	Term Paper Due	
a.	Bias & Discrimination, statistical issues	Cleary, et al. (1975)
b.	Public Policy: The data and the court cases	Reschly (1980)
c.	Summary and directions for the future.	Carroll (1997) Ackerman (in press)

FINAL EXAMINATION -- *Wednesday, December 14, 2:50 am - 5:40 pm*

TEXTS

- Cronbach, L. J. (1990). *Essentials of psychological testing, 5th Edition*. New York: Harper & Row.
- Kim, J., & Mueller, C. W. (1978). *Introduction to factor analysis: What it is and how to do it*. Beverly Hills, CA: Sage.

Additional Required Readings

- Ackerman, P. L. (1987). Individual differences in skill learning: An integration of psychometric and information processing perspectives. *Psychological Bulletin, 102*, 3-27.
- Ackerman, P. L. (1994). Intelligence, attention, and learning: Maximal and typical performance. Chapter in D. K. Detterman (Ed.) *Current Topics in Human Intelligence; Volume 4: Theories of Intelligence*, pp. 1-27. Norwood, NJ: Ablex.
- Ackerman, P. L. (1996). A theory of adult intellectual development: process, personality, interests, and knowledge. *Intelligence, 22*, 229-259.
- Ackerman, P. L. (2000). Domain-specific knowledge as the “dark matter” of adult intelligence: gf/gc, personality and interest correlates. *Journal of Gerontology: Psychological Sciences, 55B (2)*, P69-P84.
- Ackerman, P. L. (2007). New developments in understanding skilled performance. *Current Directions in Psychological Research, 16*, 235-239.
- Ackerman, P. L. (in press). Intelligence as potentiality and actuality. To appear in R. J. Sternberg (Ed.), *The Nature of Intelligence*. Cambridge University Press.
- Ackerman, P. L., Chamorro-Premuzic, T., & Furnham, A. (2011). Trait complexes and academic achievement: Old and new ways of examining personality in educational contexts. *British Journal of Educational Psychology, 81*, 27-40.
- Ackerman, P. L., & Heggstad, E. D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin, 121*, 219-245.
- Carroll, J. B. (1997). Psychometrics, intelligence, and public perception. *Intelligence, 24*, 25-52.
- Cleary, T. A., Humphreys, L. G., Kendrick, S. A., & Wesman, A. (1975). Educational uses of tests with disadvantaged students. *American Psychologist, 30*, 15-41.
- Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist, 12*, 671-684.
- Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist, 30*, 116-127.
- Deary, I. J. (2000). Simple information processing and intelligence. In R. J. Sternberg (Ed.) *Handbook of Intelligence*, 267-284. New York: Cambridge University Press.
- Ferguson, G. A. (1954). On learning and human ability. *Canadian Journal of Psychology, 8*, 95-112.
- Fleishman, E. A. (1972). On the relation between abilities, learning, and human performance. *American Psychologist, 27*, 1017-1032.

- Hambrick, D. Z., Macnamara, B. N., Campitelli, G., Ullén, F., & Mosing, M. A. (2016). Beyond born versus made: A new look at expertise. *Psychology of Learning and Motivation, 64*, 1-55.
- Guilford, J. P. (1956). The structure of intellect. *Psychological Bulletin, 53*, 267-293.
- Horn, J. L. (1968). Organization of abilities and the development of intelligence. *Psychological Review, 75*, 242-259.
- Horn, J. L. & Cattell, R. B. (1966). Refinement and test of the theory of fluid and crystallized general intelligences. *Journal of Educational Psychology, 57*, 253-270.
- Humphreys, L. G. (1979). The construct of general intelligence. *Intelligence, 3*, 105-120.
- Hyde, J. S. (1981). How large are cognitive gender differences? A meta-analysis using ω^2 and d . *American Psychologist, 36*, 892-901.
- Lohman, D. F. (2006). Exploring perceptions and awareness of high ability. *Roeper Review, 29(1)*, 32-40.
- Lohman, D. F., & Lakin, J. M. (2011). Intelligence and reasoning. In R. J. Sternberg & S. B. Kaufman (Eds.). *The Cambridge Handbook of Intelligence*, pp. 419-441. New York: Cambridge University Press.
- Lord, F. M. (1963). Elementary models for measuring change. In C. W. Harris (Ed.) *Problems in measuring change*. Madison, WI: University of Wisconsin Press, 21-38.
- Lubinski, D. (2000). Scientific and social significance of assessing individual differences: "Sinking shafts at a few critical points." *Annual Review of Psychology, 51*, 405-444.
- McNemar, Q. (1964). Lost: Our intelligence? Why? *American Psychologist, 19*, 871-882.
- Miller, D. I., & Halpern, D. F. (2014). The new science of cognitive sex differences. *Trends in Cognitive Sciences, 18(1)*, 37-45.
- Reinert, G. (1970). Comparative factor analytic studies of intelligence throughout the human life-span. In L. R. Goulet & P. B. Baltes (Eds.), *Life-span developmental psychology*, 467-484. New York: Academic Press.
- Reschly, D. J. (1980). Psychological evidence in the Larry P. Opinion: A case of right problem - wrong solution? *School Psychology Review, 9*, 123-135.
- Schaie, K. W., & Strother, C. R. (1968). A cross-sequential study of age changes in cognitive behavior. *Psychological Bulletin, 70*, 671-680.
- Schneider, W. J., & McGrew, K. S. (2012). The Cattell-Horn-Carroll model of intelligence. In D. P. Flanagan & P. L. Harrison (Eds.) *Contemporary Intellectual Assessment*, 99-144. New York: The Guilford Press.
- Snow, R. E. (1989). Aptitude-treatment interaction as a framework for research on individual differences in learning. In P. L. Ackerman, R. J. Sternberg, & R. Glaser (Eds.). *Learning and individual differences. Advances in theory and research*, 13-59. New York: W. H. Freeman.
- Snow, R. E. (1996). Aptitude development and education. *Psychology, Public Policy, and Law, 2*, 536-560.
- Sternberg, R. J. (1985). Introduction: What is an information processing approach to human abilities? (1-4) and General intellectual ability. (Chapter 1; 5-29). In R. J. Sternberg (Ed.). *Human abilities: An information-processing perspective*. San Francisco: Freeman.

Wolfe, D. (1940). *Factor analysis to 1940*. Chicago: University of Chicago Press, (Also, *Psychometric Monograph No. 3.*)

Yuan, K., Steedle, J., Shavelson, R., Alonzo, A., & Oppezzo (2006). Working memory, fluid intelligence, and science learning. *Educational Research Review, 1*, 83-98.