Thursday 8/26

I. Introductions

II. Overview of the course: syllabus

III. For Tuesday (9/2)

A. Topics:
   1. Definition and theories of intelligence: history and issues, role of genetics vs. environment
   2. Overview of Wechsler's work and his scales
   3. Future of intelligence testing

B. Reading: Chs 1, 5, 6 in Sattler book; APA Task Force Report – Neisser et al. (1996); Schlinger (2003); Sternberg (1997); Neisser (1997); Uttl & Van Alstine (2003); Daniel (1997)
II. Intelligence and Intelligence Testing: Sattler Ch 1-6 plus articles

A. Definition and Theories of Intelligence: Reading: Sattler Ch 1,5,6; Neisser et al. (1996); Schlinger (2003); Sternberg (1997); Neisser (1997); Uttl & Van Alstine (2003); Daniel (1997)

1. Why test intelligence?
   a. practical need - Binet

   b. theoretical - 1921 symposium on intelligence

2. History: Defining Intelligence and Intelligence Testing
   a. Sensory based: Galton (1880's); Deary et al. (2004): recent support for relationship between general sensory discrimination ability and intelligence

   b. Higher mental processes: Binet
      1) intelligence: collection of faculties...judgment, practical sense, initiative, ability to adapt to circumstances

      2) 1905 Binet-Simon scale: qualitative

      3) 1908 scale: quantitative - mental age, more items, ages

      4) 1911 scale: increased items, ages to adult

      5) 1916 revision at Stanford with Terman: Stanford-Binet used Stern's (1914) MQ = MA/CA

   c. World War I: Terman, Spearman, Thorndike, Cattell
      a) Army alpha: verbal and nonverbal

      b) Army beta: illiterate, non-English speaking

   d. 1921 Symposium - J of Ed Psych - define intelligence
      1) Terman: ability think abstractly

      2) Kolvin: ability learn/adapt to the environment (Woodrow)

      3) Thorndike: facts - ability to give the correct response

      4) still not resolved (Sternberg & Detterman, 1986): 1986 symposium: 2 dozen different definitions

      5) most agree: abstract reasoning, problem solving, capacity to acquire knowledge, also adapt to environment (Snyderman & Rothman, 1987)
e. Statistical theorists: factor analysis developed by **Pearson**

1) **Spearman** (1904): 2 factor theory: subtest performance = g + S
   a) "g" - underlying, global, r between all tests

   b) specific - S1, S2, S3, ..., idiosyncratic to task

2) **Thorndike** (1927): no g; 3 types: **social, concrete, abstract intelligence**.

3) **Thurstone** (1938): theory of primary mental abilities
   a) primary mental abilities: verbal meaning, number facility, inductive and deductive reasoning, perceptual speed, spatial relations, memory, verbal fluency

   b) factor analysis ->added "g" to later theory

4) **Guilford** (1967): 3-D structure of intellect model:
   a) intelligence is interaction of 3 factors:
      1> content of test: e.g., letters, numbers, words

      2> operations: e.g., memory, convergent thinking

      3> products: e.g., units (single r), relations (rel. between units), implications (most complex - extrapolate from info)

   b) 120 cells in model - proposed a subtest for each

5) **Vernon** (1961): hierarchical model:
   a) "g" (highest)

   b) 2 major group factors:
      1> verbal educational

      2> spatial mechanical

   c) minor group factors

   d) specific factors

6) Other hierarchical theorists: **Horn** (1985); **Gustaffson** (1984); **Carroll**: based on **Cattell**’s theory of fluid and crystallized intelligence but added a number of specific factors

3. Issues in intelligence testing/concept of intelligence; is intelligence...

a. is intelligence... Quantitative or qualitative?

b. is intelligence... Observable or inferred?

c. is intelligence... A noun or a verb - product/outcome or a process?

1) traditional: noun, product

2) newer Information Processing Models emphasize process:

a) architectural vs executive systems

b) Campione and Brown (1978);
   - elaboration by Borkowski: cognitive, motivation, self system components

c) Sternberg (1986, 1997): triarchic theory of intelligence:
   1> analytic, creative, practical intelligence

   2> note that Sattler calls this theory “successful intelligence theory” and calls his older theory (componential, experiential, contextual components) “triarchic”

   3> tacit knowledge

d) Das (1972, 1976)
   1> simultaneous & successive processing

   2> PASS model (planning, attention, simultaneous, sequential)

d. is intelligence... Singular or plural - one general ability or are there multiple intelligences?

1) accept g - general cognitive ability

   a) Spearman, Thurstone, Vernon

   b) Pearson - factor analysis: g + specific types intelligence

   c) Wechsler tests: global factor "g" + 3-4 specific factors: verbal, perceptual organization, freedom from distractibility (attention), processing speed

2) reject g - propose multiple intelligences

   a) Thorndike multifactor, Guilford 3-D, Horn's hierarchical

   b) Gardner (1983): linguistic, musical, spatial, logical-mathematical, bodily kinesthetic, interpersonal, intrapersonal intelligences: Are these different types of intelligence or are some of these "talents"?

   c) Sternberg (1986): 3 types of intelligence: analytic, creative, practical intelligence; however, he suggests they share a similar underlying process
e. is intelligence... Innate or learned? (Role of genetics vs. environment)

1) **Hebb**: 2 intelligences:
   a) **intelligence A**: inborn, potential, can't measure
   b) **intelligence B**: developed, from learning, IQ measures

2) **Cattell**: 2 intelligences:
   a) **fluid**: neurophysiologically based (like A)
   b) **crystallized**: developed through learning (B)

3) **Vernon**: elaborated on Hebb's intelligence A and B, added C
   a) A: innate, genetic; necessary for B
   b) B: observed behavior, learning and environment
   c) C: measured intelligence - IQ; affected by:
      1> learning, environment
      2> test format validity, reliability
      3> test conditions
      4> personality, cooperation, motivation, anxiety
      5> physical, illness, disability
      6> NOT permanent, can change
      7> Use intelligence C to infer A and B
      8> reflects much of current perspective on intelligence, intell tests and IQ

4) Carroll, Horn models based Cattell's fluid, crystallized: cross battery assessment approach

5) Wilson (1975) twin concordance for IQ: MZ=.76-.86; DZ=.35-.55
   a) concordance?
   b) twin paradigm: why use MZ vs DZ?
   c) adopted vs raised together

6) **Sattler** (text): about 50% genetic/biological, rest environmental

7) **Neisser et al. (1996)** APA Task Force Report: review: heritability ($h^2$) changes with age
   a) Increased role of genetics with age; why?
   b) Genetics not imply intelligence is fixed

8) **Neisser (1997)**: what is Flynn effect? Which scores are most affected? How is it explained?

9) **Uttl & Van Alstine (2003)**: found vocabulary also increasing with age; however, increase is for elderly; how does this qualify Flynn’s interpretation of the data? How is it explained?
10) Ericsson & Charness (1994): role of learning in gifted; interaction of environ w/ genetics

11) Nongenetic biological factors (environmental factors can be biological): what are some?

12) Effect of environment - psychosocial and learning (but can include physical, biological): what are some enviromental factors associated with IQ?

13) Rodgers et al. (2000): examined effect of birth order on intelligence
   a) past research found lower IQ for later birth order; however, looked across families – explained by dilution of family resources
   b) they looked within families; found mothers with lower IQs had more children (thus explaining previous findings of lower IQs of later birth order children (high correlation between mother’s IQ and child’s IQ)

   f. is intelligence... A myth? Schlinger (2003):
      1) “intelligence” doesn’t exist as an entity – is a set of behaviors in different contexts
      2) results of factor analytic studies resulted in reification of “g” as general intelligence
      3) advocates for a functional approach that focuses on intelligent behaviors

4. Future Intelligence tests and theories:

   a. Matarazzo (1992)
      1) Include physiological and RT
      2) Reflect new theories of intelligence
      3) Blend with neuropsychological assessment

   b. Daniels (1997)
      1) Influenced by theoretical models, new techniques (structural equation modeling)
      2) Dynamic assessment

   c. Sternberg (1997): sees intelligence as necessary for adaptation to the environment;
      1) however, traditional measures favor analytic intelligence
      2) education has also neglected needs of individuals high in creative and practical intelligence
      3) How might his concerns be addressed in the future?
6. Wechsler's View of Intelligence and his Scales

a. Intelligence:
   1) definition: "the aggregate or global capacity of the individual to act purposefully, think rationally and deal effectively with the environment"
   2) role of aging and psychopathology important

b. Wechsler Tests:
   1) Wechsler-Bellevue (1939)
   2) Wechsler Adult Intelligence Scale WAIS (1955): 16 yrs-adult
   3) Wechsler Intelligence Scale for Children WISC (1949): 6-16 yrs
   4) Wechsler Preschool and Primary Scale of Intelligence: WPPSI (1967): 4-6 ½ yrs

c. Structure of tests:
   1) subtests: mean of 10, SD of 3
   2) IQs and composite scores: mean of 100, SD of 15
   3) divided into VIQ, PIQ, and FSIQ (some changes in most recent versions of tests)

B. Measurement Issues: Reading: Sattler Ch 4; Turner et al. (2001)

1. Descriptive Statistics
   a. Mean, median, mode
   b. Variance, standard deviation

2. Norm-referenced vs criterion-referenced measurement
   a. Criterion-referenced measurement:
      1) what is it?
      2) advantages/disadvantages?
   b. Norm-referenced measurement
      1) Standardization population/normative group
      2) Age and grade norms (age vs grade equivalents)- advantages/disadvantages
      3) Percentile (vs percentage)
4) Ratio IQ=MA/CA: problems? Different SDs at different ages

5) Standard scores - normalize scores
   a) z score: \( z = \frac{x - \mu}{\sigma} \)  
   \( Z \) score = \((\text{score} - \text{mean}) / \text{SD for test; } \text{mean}=0, \text{SD}=1\)
   b) t score: mean=50, SD=10 (MMPI)
   c) stanine: mean=5, SD=2
   d) deviation IQ: mean=100, SD=15 (SD=16 for the Stanford-Binet)
   e) normal distribution of IQ scores (figure 1)
   f) classification of intelligence (figure 2)

3. Other factors in test development: Ceiling effects; floor effects; item gradients
   a. Ceiling effects
   b. Floor effects
   c. Item Gradients

4. Reliability
   a. definition: consistency, repeatability
   b. Test score = \( T = T (\text{true score}) + E (\text{error}) \)
   c. types of reliability:
      1) test-retest
      2) alternate (parallel or equivalent) forms
      3) internal consistency; KR-20 or 21; coefficient alpha
   d. Factors affecting reliability/threats to reliability: list some:
      e. Standard error of measurement (Sem)
      f. confidence intervals

5. Validity
   a. definition:
b. types of validity:

1) content

2) criterion:
   a> concurrent
   b> predictive
   c> test prediction and base rates: Baye's theorem (example)

3) construct:
   a> convergent
   b> divergent
   1> Campbell & Fiske (1959) multitrait, multimethod matrix (example)
   2> factor analysis

C. Factors that Affect Intelligence, Test Results, and Considerations in Test Selection: Reading: Sattler Ch 2, 6 (skim Ch 3); Gould (1996); Alderfer (2003); Schlinger, 2003 (also see Sattler Ch 1, 4; Neisser et al., 1996; Neisser, 1997; Sternberg, 1997; Turner et al. 2001)

   1. Threats to validity of intelligence test results:
      a. test factors

      b. examinee factors

      c. environmental factors

   2. "Non-intellectual Factors" in intelligence testing (related to above)
      a. Motivation and personality
b. Psychopathology and medical problems

c. Environmental and cultural


3. Pros and cons of IQ testing; misuse and limitations of IQ tests - Gould (1996); Alderfer (2003); Schlinger (2003); (discussion)

   a. American’s “misuse” of Binet’s MA (and later IQ)

   b. Reification of the IQ score

   c. “g”: what is it? can factor analytic techniques establish whether it exists?

   d. Herrnstein and Murray’s The Bell Curve (1994)

   e. Misinterpretation of genetic data: group differences, immutability, need to square correlation coefficient to get the percent of variance

   f. Test score is:
      1> a product of abilities and environment, personality, motivation
      2> a limited sample of behaviors, in a limited (and unique) setting, at one point in time (cross-sectional) and for a short time period
      3> not fixed

4. Test Selection: Turner et al. (2001)

   a. Referral question

   b. Reliability (where find?)

   c. Validity: for what purpose, population

   d. Norms (where find?)

   e. Competence to use
f. Client characteristics

g. Multiple sources - more info or more error? Confirmation bias?

h. Incremental validity

i. cost-benefit ratio
III. Basic Skills: Reading: Sattler Ch. 7, 21 (also see Ch 1) plus articles

A. Interviewing (handout): Reading: Sattler Ch 7, 1

1. Purposes:
   a. General rapport building and establishing set

   b. Gather information: notes, observations

2. Stages of the interview
   a. Initial: open-ended, rapport

   b. Middle: more direct, focused, specific

   c. Final: summary, further information

3. Specific Information to gather (see handout)
   a. Interview with parent and child

   b. Interview with adult

B. Behavioral Observations (handout): Reading: Sattler Ch 7, (see Ch 1)

1. Specific method of assessment

2. As part of all psychological evaluations
   a. General Observations (examples?)

   b. Test-specific observations (examples?)

   c. we will use these two paragraphs in reports for this class

3. child behaviors to observe: Sattler Table 7-3 (p 195-196)

4. behaviors suggesting possible psychological difficulties: Sattler Table 7-4 (p 197-198) and Table 7-5 (p. 199): use caution!

C. Test Administration: Reading: Sattler Ch 7

1. Pre-test:
   a. introduction: who you are, qualifications
   b. purpose: your practice; no feedback!
   c. tasks, duration (often two sessions)
   d. establish set - motivate
   e. comfort
   f. environment
   g. have materials ready
   h. establish positive examiner nonverbal behaviors before and continue during testing (see Sattler Table 7-1, p. 185)

2. Test administration:
   a. read verbatim - standard
   b. demonstrate slowly, deliberately
   c. record verbatim (abbreviations)
   d. use of query:
      1) use for unclear response, response can’t score, response with “Q” after them in the manual
      2) also don't accept initial DK response; use a Q
      3) don't probe clearly correct (or clearly incorrect) responses
   e. rules for repeating items:
      1) not memory subtests!
      2) For timed items: keep timing when repeating the item
   f. inconspicuous timing (tell them but keep inconspicuous)
   g. neutral but encouraging - for effort
   h. watch for E (examiner) bias – examiner expectancy effect
   i. score as you go: Q if not enough information to score
   j. testing the limits (optional and only after test completed); recent revisions have formalized this process, but still optional
k. Sattler Table 7-2: General Test Administration Practice Checklist (p. 188)
   1) observer will use to provide feedback to examiner for this class:
   2) give copy to the examiner and turn in with your two WISC administrations

3. Additional considerations when testing children
   a. minimize distractions
   b. Comfort - ask
   c. low voice
   d. friendly but firm
   e. observe - look for boredom, fatigue, restlessness
   f. don't talk down - treat as a person
   g. don't compare to other children or to self
   h. writing sample
   i. ice-breaker task

4. Additional considerations for this course:
   a. use xeroxed copies of the protocols when practicing with each other!
   b. proficiency exams before test volunteers
   c. volunteers - strangers; diverse: ages, ethnicity, race, background
   d. no feedback about tests: tell them (parents) at beginning
   e. fill out/sign consent form (parent or legal guardian for child)
   f. administer all subtests (including optional tests)
   g. divide up test session as needed: can take breaks – between subtests; often two sessions needed
   h. finish scoring and write up report ASAP

D. Report writing (handout): Reading: Sattler Ch 21; Harvey (1997)
   1. General guidelines
   2. Specific information (handout)
   3. Pitfalls to avoid in report writing: Sattler; Harvey (1997): careful of reading level required
   4. Write for the audience - who will be receiving it - and purpose of the report; know who will be receiving the report: school/teacher, parent, psychologist, our files only