Announcements

- Chapter 8 Aplia due tonight
- Chapter 11 Aplia due a week from today
- Exam #4 is a week from Wednesday (and review session a week from today)
A wee bit more on Memory
Childhood “Amnesia”
Our Memories!

Age at First Memory

%
Memories undated

I don't remember how old I was but I remember my mom dropping me and saying oh sh#t not again but I don't remember the first time she dropped me.
Memories age 1

- Birthday cake sitting in front of me on the highchair. Face planting into it.
Memories age 2

I remember the first day I rode my bike without my training wheels. My cousin, who is 3 years older than me had hers taken off by our grandfather and I just did not want to use them if she didn't, and actually rode better than her.
Memories age 3

- My earliest memory is in my ballet class when I was about 3 years old. I remember telling my mom I didn't like going because they forced us to walk around with our arms above our heads and it made me too tired.

- The first memory I have happened when I was about 3. My dad had taken me to the bar where his girlfriend (now wife of 17 years!) was working. They had a pool table there and she paid for the balls and I walked around putting the balls in the holes. I thought it was the coolest thing!
Memories age 3

My brother was turning 6 that year and I remember being very upset that my brother was turning 6 and I was only 3 years old. I cried and complained to my parents about it and they tried explaining to me that I would one day turn 6 just like my brother but I was not having it.
Memories age 4+

- Age 5: I remember living in San Diego near the beach and I always saw my older sisters paint their nails and play with barbies, so i did the same... I'm a boy....

- Age 7: I remember being obsessed with strawberry milk. One day I was sitting at the dinner table and i drank so much strawberry milk that I puked strawberry colored goo all over the dinner table while the whole family was present.
Memories age 4+

- I was in daycare, it was lunch time and we were watching space jam while eating cinnamon crackers dipped in Apple juice next to my first friend bobby :)

- Age 5: I remember riding a tricycle during preschool, and sitting on the carpet for story time.
Can we differentiate true from false memories
Brain Electrical Activity as a way to Assess Memory, Independent of Verbal Report
Ongoing EEG

Stimuli

Visual Event-related Potential (ERP)
ERP Memory Assessment Procedures

- Learn a list of words
- Learn a second list of words
- Task: Concealed (1st list) and Nonconcealed (2nd list) words appear infrequently

<table>
<thead>
<tr>
<th>Item Type</th>
<th>Probability</th>
<th>Response</th>
<th>P3 Amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonconcealed</td>
<td>1/7</td>
<td>“Yes”</td>
<td>Large</td>
</tr>
<tr>
<td>Concealed</td>
<td>1/7</td>
<td>“No”</td>
<td>Large if Recognized</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Small if not Recognized</td>
</tr>
<tr>
<td>Unlearned</td>
<td>5/7</td>
<td>“No”</td>
<td>Small</td>
</tr>
</tbody>
</table>

- Similar to procedures by Rosenfeld et al, Farwell & Donchin
A Laboratory Paradigm for False Recollections: DRM

- Subjects presented with 15 words highly associated with an omitted critical item:

  Bed, rest, awake, tired, dream, wake, snooze, blanket, doze, slumber, snore, nap, peace, yawn, drowsy
Reported Rates of Recognition

Forced Choice

Likert Confidence

Learned
Lure
Unlearned

Allen & Mertens (2009)
Mental Abilities
I. Overview & Definition

A. Nature of Intelligence--What is it??
   Book smarts
   Street smarts
   Mechanical smarts
   Artistic or musical smarts
   Basketball IQ!
   Memory, attention, language, math, analytical?

General (g) or Many Specific
I. Overview & Definition

B. Types of tests
   1. Ability (AKA Aptitude): Predict future Performance
   2. Achievement: Assess knowledge
   3. Distinction can be fuzzy

C. Importance of the tests

D. Finally, remember that a score on a test is only that
II. Measurement concepts

A. Variability & Variance: the basis for making distinctions based on intelligence test performance
   1. The point of tests is to discriminate between people who vary in some attribute (e.g., Intelligence)
   2. Discriminate between, not discriminate against

B. Correlation: Variance in scores on one variable are related in some way to variance in scores on another variable;
   1. Correlation does not indicate anything about causality
      Relationship rarely perfect
   2. Correlations form basis of claims that intelligence tests are good or bad (or ugly)
II. Measurement concepts

C. Reliability: Repeatable, consistent
D. Validity: Does this test measure what it is intended to measure?
   1. Reliability does not ensure validity:
   2. Validity measured via a correlation coefficient also

Intelligence tests are, by and large, highly reliable; there exists debate about their validity

In other words, if you take the test multiple times, you’re likely to get the same score. But what does that mean?!
III. Various conceptualizations of Intelligence

Galton: eminent British Vs. ordinary citizens

Measured reaction times, head size, finger ratios, anything imaginable

No measure distinguished the eminent from the ordinary

1%
III. Various conceptualizations of Intelligence

B. Binet & IQ

1. Binet's assumptions
   
   Reasoning and Problem Solving
   
   Normal children and slow children differ in how quickly they acquire knowledge and skills
   
   Good items differentiate older from younger kids; e.g., “Tommy’s feet…”

2. **Mental Age**: chronological age of typical child who passes as many items as a given child

3. **Intelligence Quotient**  
   
   \[ \text{IQ} = \frac{\text{MA}}{\text{CA}} \times 100 \]

4. IQ scores distributed **Normally**
III. Various conceptualizations of Intelligence

C. MA/CA Vs. Deviation Quotients

1. Problems with the MA/CA derived IQ score
   Scores change easily with age
   Child two years ahead of CA
   Age 4, MA=6; (MA/CA)*100 = 150
   Age 10, MA=12; (MA/CA)*100 = 120

2. Deviation Quotient therefore adopted
   a) Average for each age set to 100
   b) Scores scaled to have Standard Deviation of 15
Number of scores

Wechsler intelligence score

Sixty-eight percent of people score within 15 points above or below 100

Ninety-five percent of all people fall within 30 points of 100

0.1% 2% 14% 34% 34% 14% 2% 0.1%

55 70 85 100 115 130 145
Various conceptualizations of Intelligence

- Intellectual Disability (formerly called MR) not diagnosed solely on basis of IQ
  - Low IQ
  - Deficits in *Adaptive Functioning*
  - Onset during developmental period

*We do not identify people as “athletically disabled” or “musically disabled” for purposes of special education, but clearly, such people exist. Our views of intellectual disability are intimately connected to the capabilities valued by our systems of education.* - Cacioppo & Freberg
### TABLE 10.3

#### Degrees of Intellectual Disability

<table>
<thead>
<tr>
<th>Level</th>
<th>Approximate Intelligence Scores</th>
<th>Adaptation to Demands of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Idiot</td>
<td>50–70</td>
<td>May learn academic skills up to sixth-grade level. Adults may, with assistance, achieve self-supporting social and vocational skills.</td>
</tr>
<tr>
<td>Moderate Imbecile</td>
<td>35–50</td>
<td>May progress to second-grade level academically. Adults may contribute to their own support by laboring in sheltered workshops.</td>
</tr>
<tr>
<td>Severe Moron</td>
<td>20–35</td>
<td>May learn to talk and to perform simple work tasks under close supervision but are generally unable to profit from vocational training.</td>
</tr>
<tr>
<td>Profound</td>
<td>Below 20</td>
<td>Require constant aid and supervision.</td>
</tr>
</tbody>
</table>

Many risk factors for Intellectual Disability

Genes & Environment
Especially among those with mild levels of impairment, deficits are not uniform across domains.

Sujeet Desai, who has Down syndrome, plays six instruments and is a graduate of the Berkshire Hills Music Academy in Massachusetts. Desai travels extensively as an advocate for people with disabilities.
III. Various conceptualizations of Intelligence

E. Typical Tests; e.g., Wechsler Adult Intelligence Scale (WAIS)

Involve Various Domains, for example

1. Verbal Subscales
2. Performance Subscales
VERBAL

General Information
  What day of the year is Independence Day?

Similarities
  In what way are wool and cotton alike?

Arithmetic Reasoning
  If eggs cost 60 cents a dozen, what does 1 egg cost?

Vocabulary
  Tell me the meaning of corrupt.

Comprehension
  Why do people buy fire insurance?

Digit Span
  Listen carefully, and when I am through, say the numbers right after me.

  7 3 4 1 8 6

  Now I am going to say some more numbers, but I want you to say them backward.

  3 8 4 1 6

PERFORMANCE

Picture Completion
  I am going to show you a picture with an important part missing. Tell me what is missing.

  '85

  Sun  Mon  Tue  Wed  Thu  Fri  Sat

  1  2  3  4  5  6  7
  8  9 10 11 12 13 14
  15 16 17 18 19 20 21
  22 23 24 25 26 27 28
  29 30

Picture Arrangement
  The pictures below tell a story. Put them in the right order to tell the story.

  [Pictures of three people and a dog, each doing different actions]

Block Design
  Using the four blocks, make one just like this.

  [Picture of a triangle]

Object Assembly
  If these pieces are put together correctly, they will make something. Go ahead and put them together as quickly as you can.

  [Picture of three paper cutouts, each with a different shape]

Digit-Symbol Substitution
  Code

  \[ \begin{array}{cccc}
  \triangle & \bigcirc & \slant & \times & 8 \\
  1 & 2 & 3 & 4 & 5 \\
\end{array} \]

  Test

  \[ \begin{array}{cccc}
  \triangle & 8 & \times & \bigcirc & \triangle & \slant & 8 & \times & \triangle & 8 \\
\end{array} \]
III. Various conceptualizations of Intelligence

F. Non Verbal; Raven's Progressive Matrices
   Correlates highly with verbal tests!
1. 1
2. 3
3. 5
4. 6
5. 8
III. Various conceptualizations of Intelligence

G. Factorial Approaches

1. **Spearman**: "General intelligence" or "g"
2. Thurstone: several primary abilities
3. Guilford: 128 independent abilities
4. Gardner: the Big 8
5. Sternberg: the Big 3
“Analytical” : Comparing, analyzing, and evaluating, correlates best with IQ.

“Creative” : Inventing or designing solutions to new problems. Important in handling novel situations.

“Practical” : Using (i.e., applying) the things you know in everyday contexts.
IV. Genetic & Environmental influences on intelligence

A. Genetic designs (again):

1. Three types: Family, Twin, Adoption
2. Assume that several genes are involved in the influence of intelligence; NOT a single gene for Intelligence
IV. Genetic & Environmental influences on intelligence

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3. Converging evidence from these studies that IQ is influenced in a major way by Genes
   a. Best estimates are that, given current environmental conditions, $H^2 = .70 - .85$. 
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3. Converging evidence from these studies that IQ is influenced in a major way by Genes
   a. Best estimates are that, given current environmental conditions, $H^2 = .70 - .85$.
   b. Even if something highly heritable, does not mean immutable: it can be changed.
      1) PKU
      2) Injury
The bar chart shows the similarity of intelligence scores (correlation) among different groups:

- **Identical twins reared together** exhibit the highest correlation, indicating a strong environmental effect.
- **Identical twins reared apart** show a lower correlation, suggesting some environmental effect.
- **Fraternal twins reared together** have a moderate correlation, indicating genetic effects.
- **Siblings reared together** show a lower correlation compared to twins, highlighting genetic effects.
- **Unrelated individuals reared together** have the lowest correlation, indicating minimal genetic or environmental influence.
Child-parent correlation in verbal ability scores

- Children and their birth parents
- Adopted children and their birth parents
- Adopted children and their adoptive parents

3 years
16 years
Genetic & Environmental influences on intelligence

B. Environmental Influences

1. Reaction Range
2. Head Start Programs
Genetic & Environmental influences on intelligence

C. Sex Differences: very few
Genetic & Environmental influences on intelligence

D. Race Differences

1. Consistent finding that blacks score lower than whites, by an average of 15 IQ points; WHAT does this mean?
WHAT does race difference finding mean?

a. Environmental disadvantage

Accounting for poverty, maternal education, characteristics of the home environment, economic and other social factors fully eliminated any racial differences in IQ test scores.

**Ethnic Differences in Children's Intelligence Test Scores: Role of Economic Deprivation, Home Environment, and Maternal Characteristics**

Jeanne Brooks-Gunn and Pamela K. Klebanov
Columbia University, Teachers College

Greg J. Duncan
Northwestern University

Brooks-Gunn, Jeanne; Klebanov, Pamela K.; and Duncan, Greg J. Ethnic Differences in Children's Intelligence Test Scores: Role of Economic Deprivation, Home Environment, and Maternal Characteristics. *Child Development*, 1996, 67, 396-408. We examine differences in intelligence test scores of black and white 5-year-olds. The Infant Health and Development Program data set includes 483 low birthweight premature children who were assessed with the Wechsler Preschool and Primary Scale of Intelligence. These children had been followed from birth, with data on neighborhood and family poverty, family structure, family resources, maternal characteristics, and home environment collected over the first 5 years of life. Black children's IQ scores were 1 SD lower than those of white children. Adjustments for ethnic differences in poverty reduced the ethnic differential by 52%. Adjustments for maternal education and whether the head of household was female did not reduce the ethnic difference further. However, differences in home environment reduced the ethnic differential by an additional 28%. Adjustments for economic and social differences in the lives of black and white children all but eliminate differences in the IQ scores between these two groups.
WHAT does race difference finding mean?

a. Environmental disadvantage
   - Note also a .83 correlation between mean state income and SAT scores, richer states, higher SATs
   - So, aptitude? Achievement?

b. The tests are biased
B. Biased Tests?

Biased items give unfair advantage to members of one race for reasons unrelated to intelligence
Item from the Black Intelligence Test of Cultural Homogeneity (B.I.T.C.H.)

Saturday Ajax got an LD:

A) He had smoked too much grass
B) He tripped out on drugs
C) He brought her to his apartment
D) He showed it off to his fox
E) He became "wised up"

Williams, 1972
Or an item from the "Loewen Low Aptitude Test," which is "designed to show my urbane white students some of the forms of test bias and to give them the experience of 'flunking' an aptitude test."

Spline is to mitre as _____ is to ____.
A. love . . . marriage
B. straw . . . mud
C. key . . . lock
D. bond . . . bail
E. bond . . . paper
WHAT does race difference finding mean?

C. Arthur Jensen, Charles Murray, Richard Herrnstein and some other old white guys would say: *Blacks are endowed with less intelligence than whites*

1. Jensen claims the tests are not biased
   A. For Black or White examinee of same IQ, same items tend to be passed or failed
   B. Test scores show similar correlations with other variables (e.g. GPA)

2. Neither Jensen, Herrnstein, nor Murray adequately address environmental disadvantage

✓ Confuse Genetic Vs Environmental factors
WHAT does race difference finding mean?

2. Keep in mind:
   a. differences each race > differences between the races
      The difference is true ON AVERAGE
   b. The difference is true given the present set of circumstances: it is changeable