

Statistics One

Lecture 2
Correlational Research

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Three Segments

- Example 1: Personality
- Example 2: Intelligence
- Example 3: Sports-related concussion

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Lecture 2 ~ Segment 1

Example 1: Personality

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Personality

- “As any parent of more than one child knows, children are not indistinguishable lumps of raw material waiting to be shaped. They are little people, born with personalities.” – Steven Pinker

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Personality



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Personality

- Personality traits
 - Traits are considered to be relatively stable, distinguishable qualities of a person

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Personality

- The Big Five personality traits
 - Openness
 - Conscientiousness
 - Extraversion
 - Agreeableness
 - Neuroticism
- OCEAN

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Personality

- Survey questions
 - Examples of questions to measure extraversion
 - Q1: I am the life of the party
 - Q2: I don't mind being the center of attention

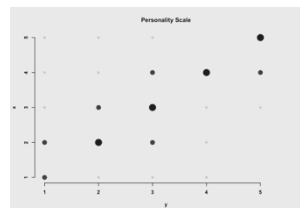
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Personality

	Disagree				Agree			
I am the life of the party.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel little concern for others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am always prepared.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to manipulate others to get my way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get annoyed out easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a rich vocabulary.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to lack remorse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't talk a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I leave my belongings around.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to wait others to admit me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am relaxed most of the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have difficulty understanding abstract ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

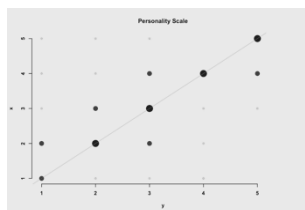
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Personality



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Personality



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Personality

- The theory of five components of personality is supported by correlational research
 - Surveys, interviews, & observations of behavior
 - For more information, see
 - Five Factor Model of Personality

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END SEGMENT

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Lecture 2 ~ Segment 2

Intelligence

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Intelligence

- *Intelligence*: "A very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings—"catching on," "making sense" of things, or "figuring out" what to." – Wall Street Journal, 1994

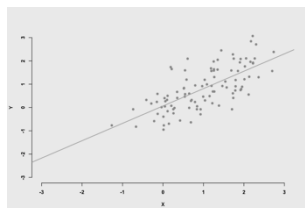
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Intelligence

- Theories of intelligence have been proposed based on detailed analysis of patterns of correlations across different types of tests
 - I refer to these as "studies" of intelligence rather than "experiments" because no variable is manipulated (no independent variable)

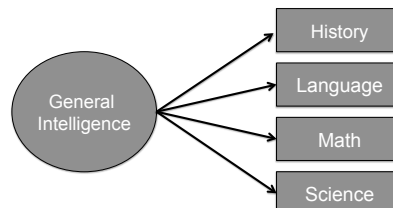
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Positive correlation



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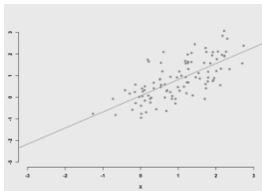
Theory of intelligence



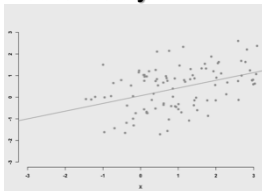
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Pattern of correlations

Math & Science

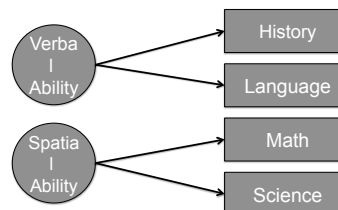


Math & History



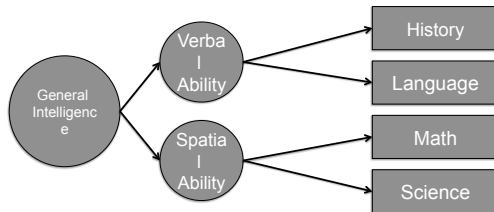
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Theory of intelligence



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Theory of intelligence



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Intelligence

- The hierarchical model of intelligence is supported by correlational research
 - There is a general ability, and
 - Several more specific abilities
- For more information, see
 - Cattell-Horn-Carroll theory of intelligence

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END SEGMENT

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Lecture 2 ~ Segment 3

Sports-related concussion

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Effects of concussion

- Sports-related concussions, especially in American football, are common and may cause neural damage and cognitive deficits

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Effects of concussion

- Quasi-independent variable
 - Treatment
 - Suffered a sports-related concussion
 - Control group
- Dependent variable
 - Neural measures
 - Cognitive measures

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Effects of concussion

Concentration

"I am going to read you a string of numbers and when I'm done you repeat them back to be in reverse order. For example if I say 7-1-9 you would say 9-1-7"

If correct go to the next string length. If incorrect, read trial 2. 1 point for each string length. Stop after incorrect on both trials. Digits should be read at rate of 1 digit/sec

Digits Backward:

Alternative digit lists

4-9-3	0 1	6-2-9	5-2-6	4-1-5
3-8-1-4	0 1	3-2-7-9	1-7-9-5	4-9-6-8
6-2-9-7-1	0 1	1-5-2-9-6	3-9-5-2-7	6-1-9-4-3
7-1-9-4-6-2	0 1	5-3-9-1-4-8	8-3-1-9-6-4	7-2-4-8-5-6

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Effects of concussion

- Confounds?
 - Prior concussions
 - Prior hits to the head (not necessarily concussions)
 - Personality types more likely to be aggressive

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Effects of concussion

- Quasi-independent variable
 - Since the IV does not involve random and representative sampling, arguments about causality are not as strong

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Lecture Summary

- Important concepts
 - Correlational research / Experimental research
 - I will refer to examples of correlational research as “studies” and examples of experimental research as “experiments”

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Lecture Summary

- Important concepts
 - Many theories, especially of personality and intelligence, have been tested by investigating patterns of correlations obtained from observational studies
 - Some things simply can't be experimentally manipulated, for example, concussions! Hence, quasi-independent variables

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END SEGMENT

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END LECTURE 2

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