IMPROVE
Quality Services

August 11 - 13, 2014
New York, NY, USA

Association for
Software
Testing
ast

"The Art and Science of Testing"

CAST

Social sciences & the art of testing

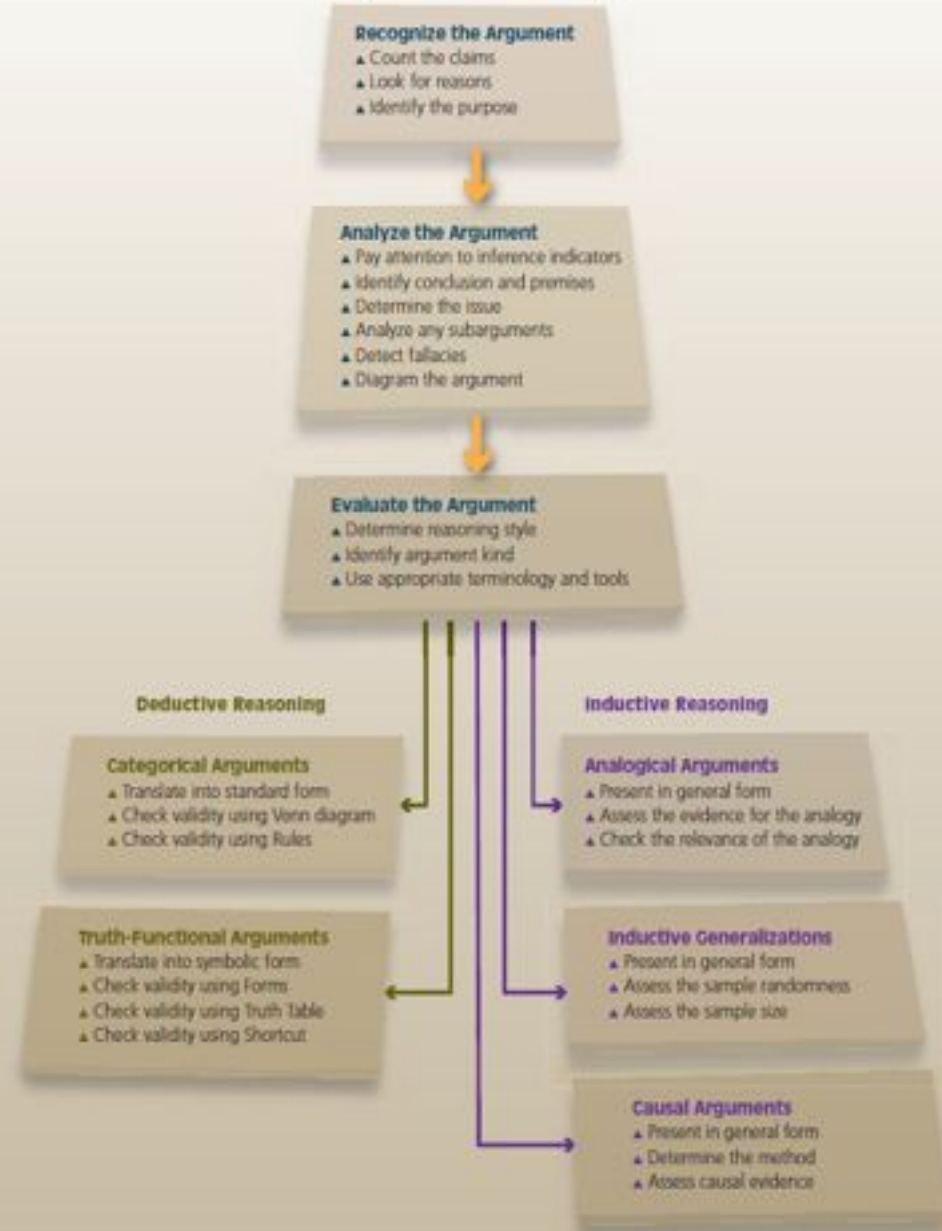## What testers can learn from social sciences

@huibschoots

Our brain

People are irrational

Critical Thinking

- Recognise argument
- Analyse argument
- Evaluate argument

- Deductive (top-down) & Inductive (bottom-up) reasoning

Steps for Critical Thinking

Recognize the Argument
- Count the claims
- Look for reasons
- Identify the purpose

Analyze the Argument
- Pay attention to inference indicators
- Identify conclusion and premises
- Determine the issue
- Analyze any subarguments
- Detect fallacies
- Diagram the argument

Evaluate the Argument
- Determine reasoning style
- Identify argument kind
- Use appropriate terminology and tools

Deductive Reasoning

Categorical Arguments
- Translate into standard form
- Check validity using Venn diagram
- Check validity using Rules

Truth-Functional Arguments
- Translate into symbolic form
- Check validity using Forms
- Check validity using Truth Table
- Check validity using Shortcut

Inductive Reasoning

Analogical Arguments
- Present in general form
- Assess the evidence for the analogy
- Check the relevance of the analogy

Inductive Generalizations
- Present in general form
- Assess the sample randomness
- Assess the sample size

Causal Arguments
- Present in general form
- Determine the method
- Assess causal evidence

Critical Thinking

Huh?

What does this mean?

What is the point?

Really?

Are you absolutely certain?

How do you know?

And?

new

Is there more?

Do you know the whole story?

So?

Where does this lead?

So what?

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Creative & critical thinking

Test Stages and Styles of Thinking

Test Stages				
Documentation Review	Test Planning	Test Execution	Test Analysis	Test Reporting
• Requirements • HLD • Feature docs	• Test Ideas • Automation • Feature files • Missions • Charters	• Test Models • Heuristics • Note Taking • Session Based Testing	• Bug Investigation • Defect reporting • Repeatability • Questioning • Automation	• Dashboard • Wiki - Sessions • Plan updates • Qualitative • Quantitative
Critical Thinking Creative Thinking	Critical Thinking Creative Thinking	Critical Thinking Creative Thinking	Critical Thinking Creative Thinking	Critical Thinking Creative Thinking

The larger the thinking area the more focus on that style of thinking

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System Thinking

What is testing?

Testers light the way. (RST)

Testing gathers information about a product with the intention to inform a decision (Jerry Weinberg)

Social science

"To test effectively, our theories of error have to be theories about the mistakes people make and when / why they make them"
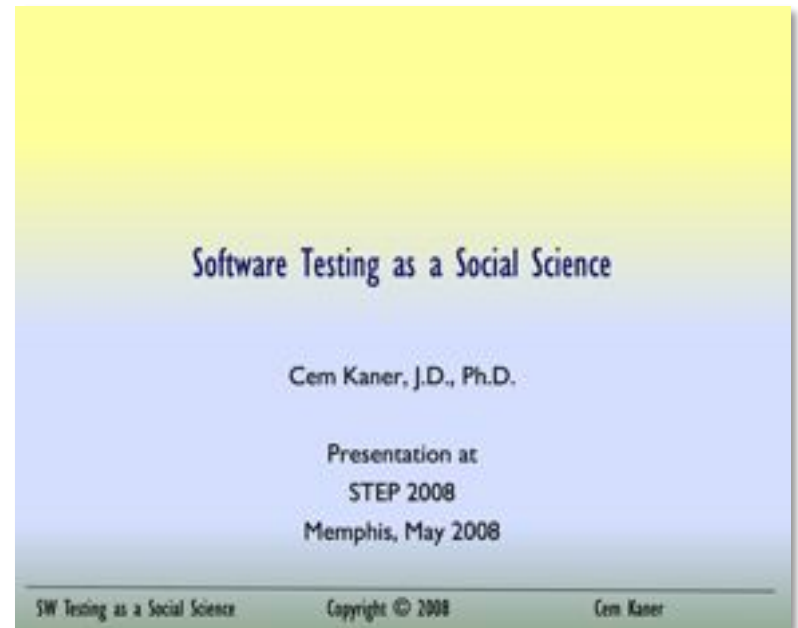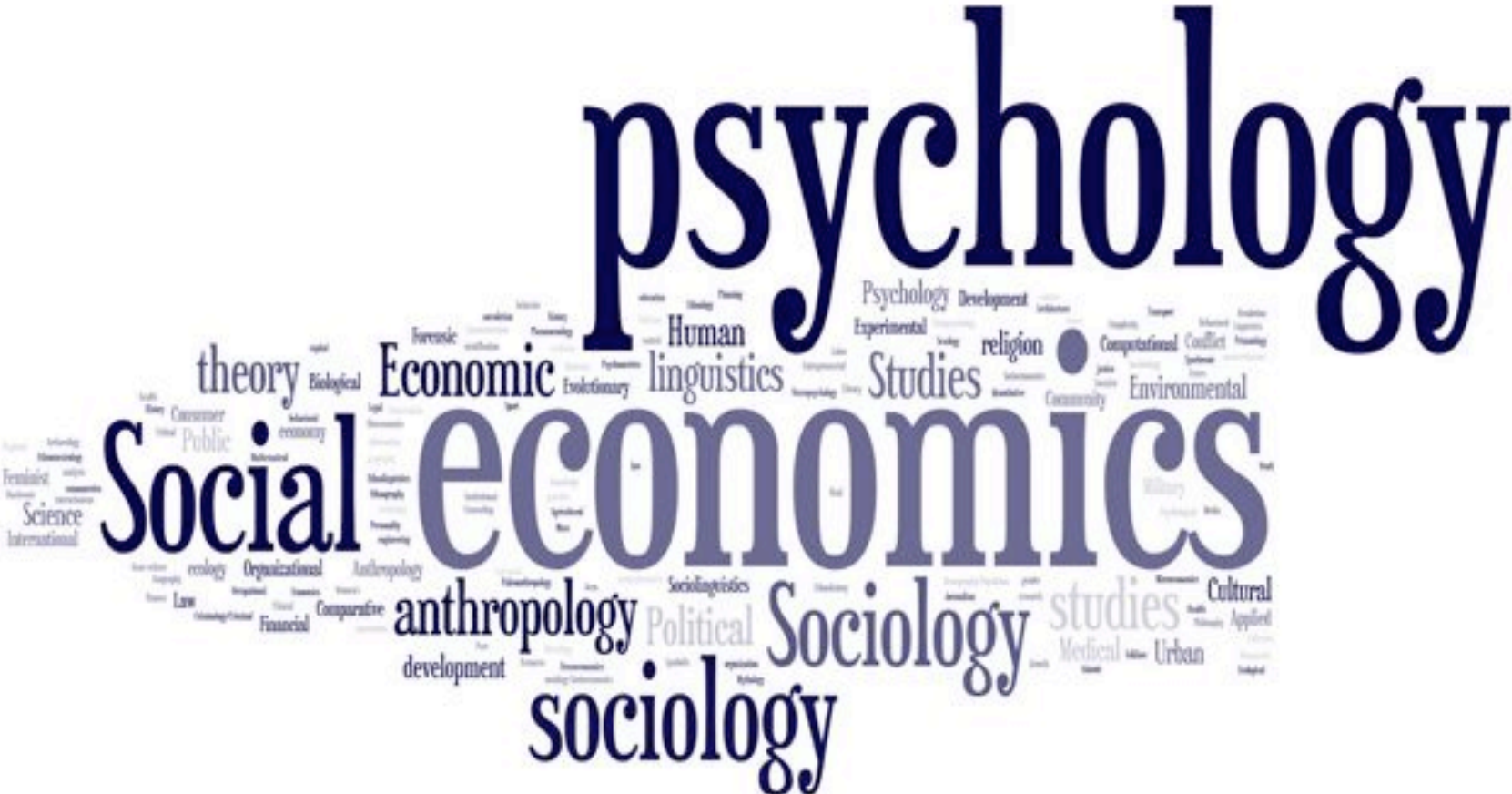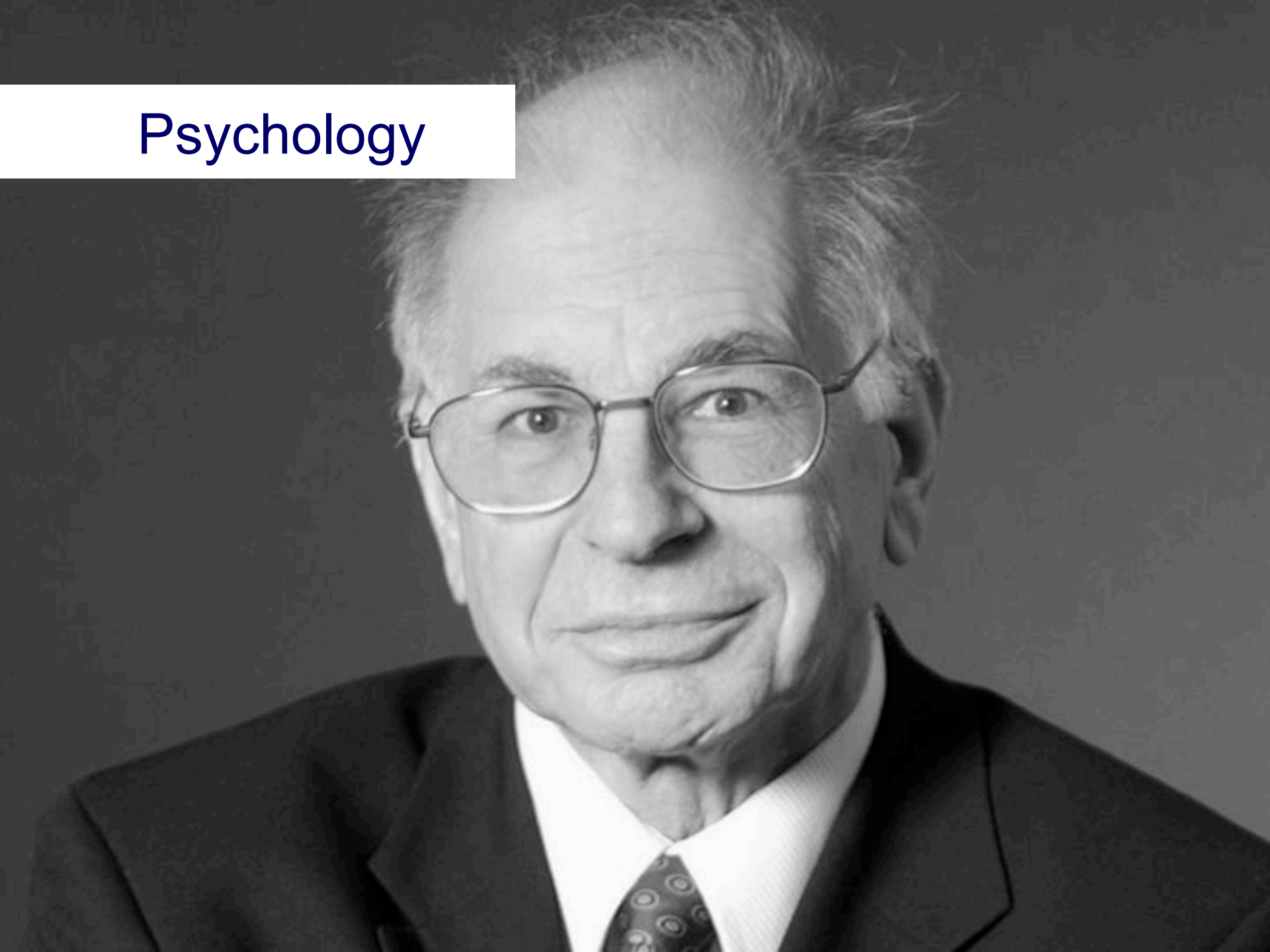

Software Testing as a Social Science

Cem Kaner, J.D., Ph.D.

Presentation at
STEP 2008
Memphis, May 2008

SW Testing as a Social Science   Copyright © 2008   Cem Kaner

What is Social science?

Social science

Psychology

Sociology
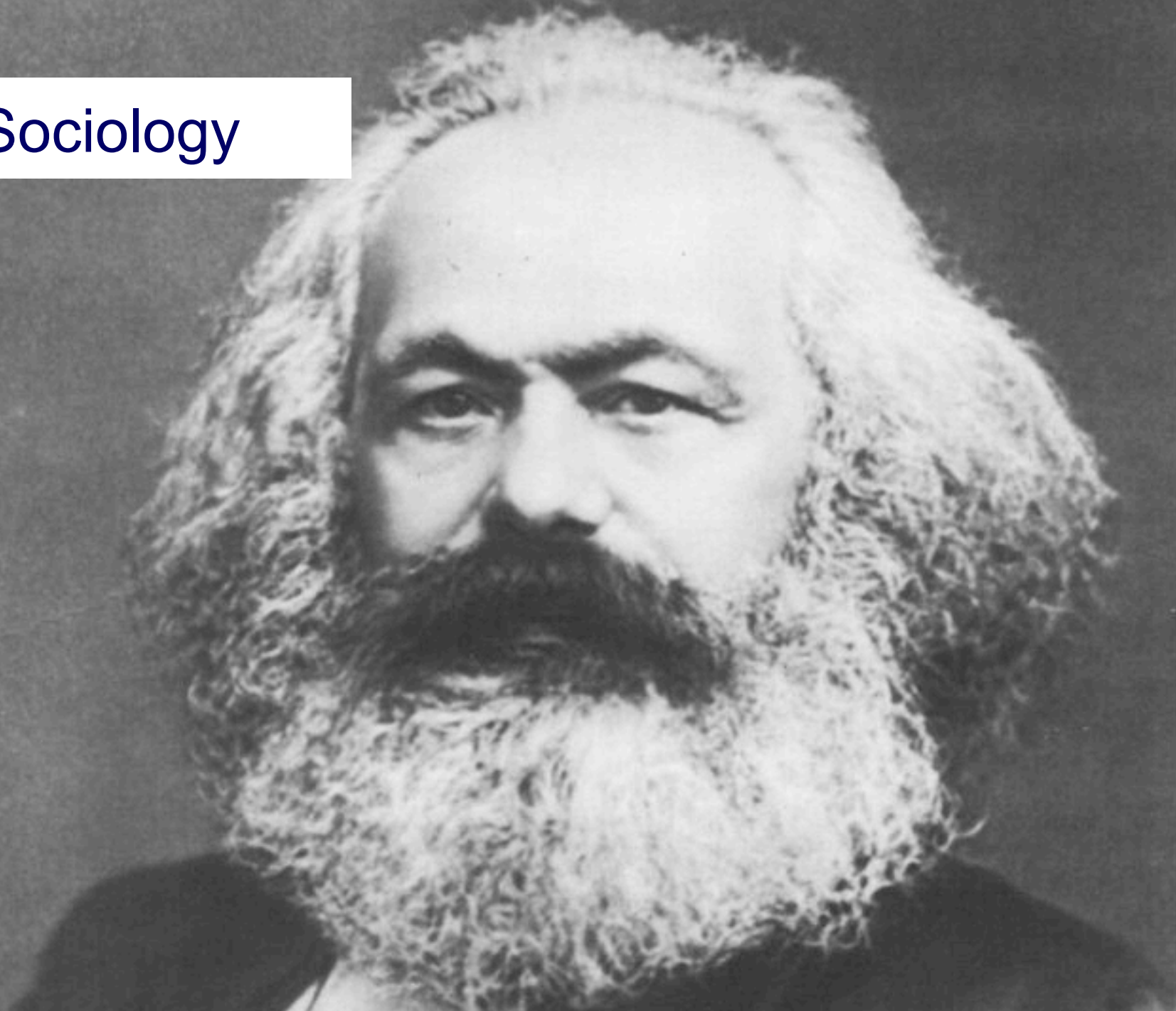
Anthropology
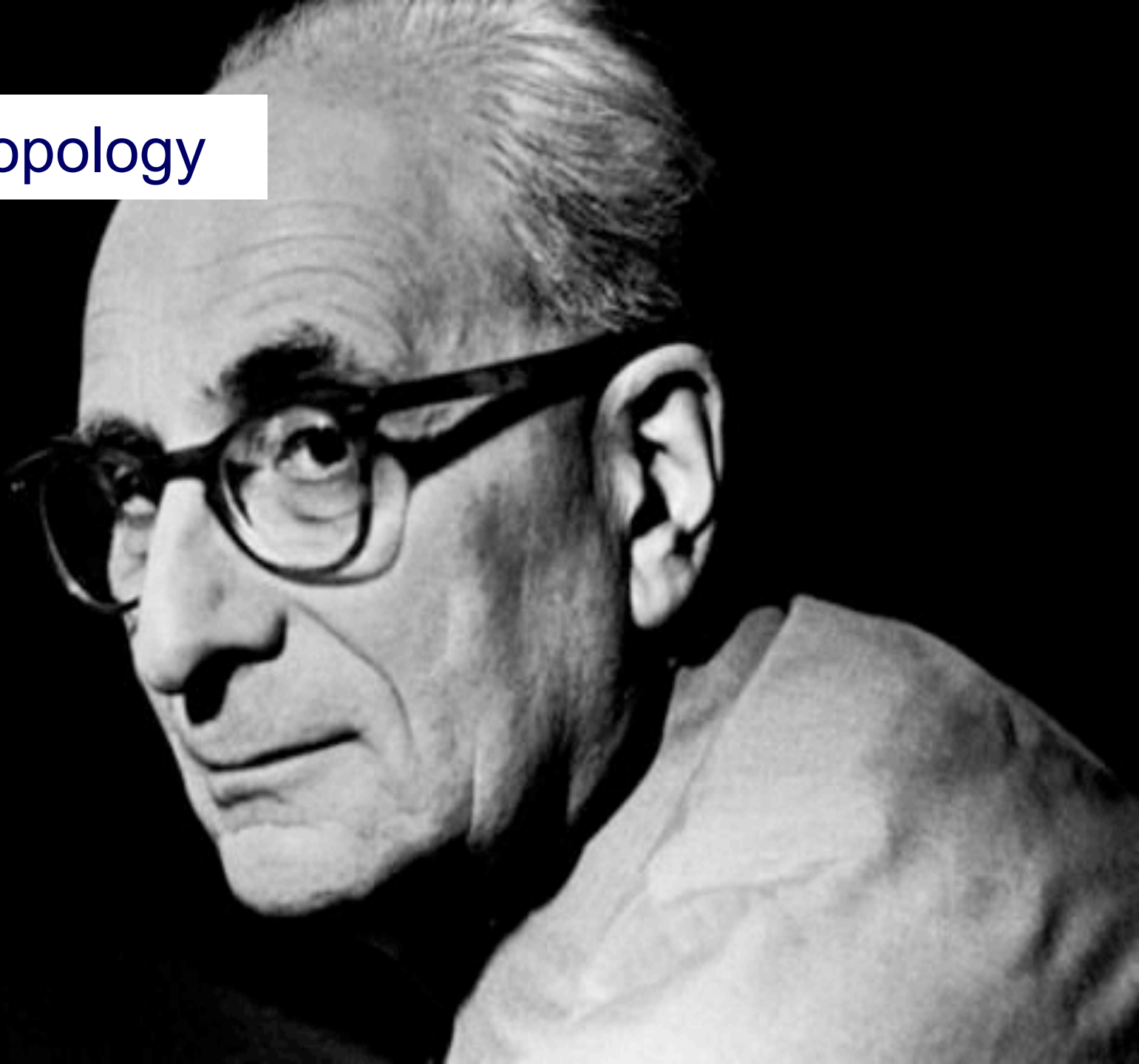
Didactic / Pedagogy

Communication studies

Communication studies

HOLLIS   The philosophy of social science   CAMBRIDGE

Zimbardo Leippe   THE PSYCHOLOGY OF ATTITUDE CHANGE AND SOCIAL INFLUENCE

Aronson   *The Social Animal*   Seventh Edition

READINGS ABOUT
The Social Animal   Seventh Edition   FREEMAN

LIPPA   INTRODUCTION TO SOCIAL PSYCHOLOGY   SECOND EDITION

ITP

Science & research

Quantitative Research

Qualitative Research

About your opinion...
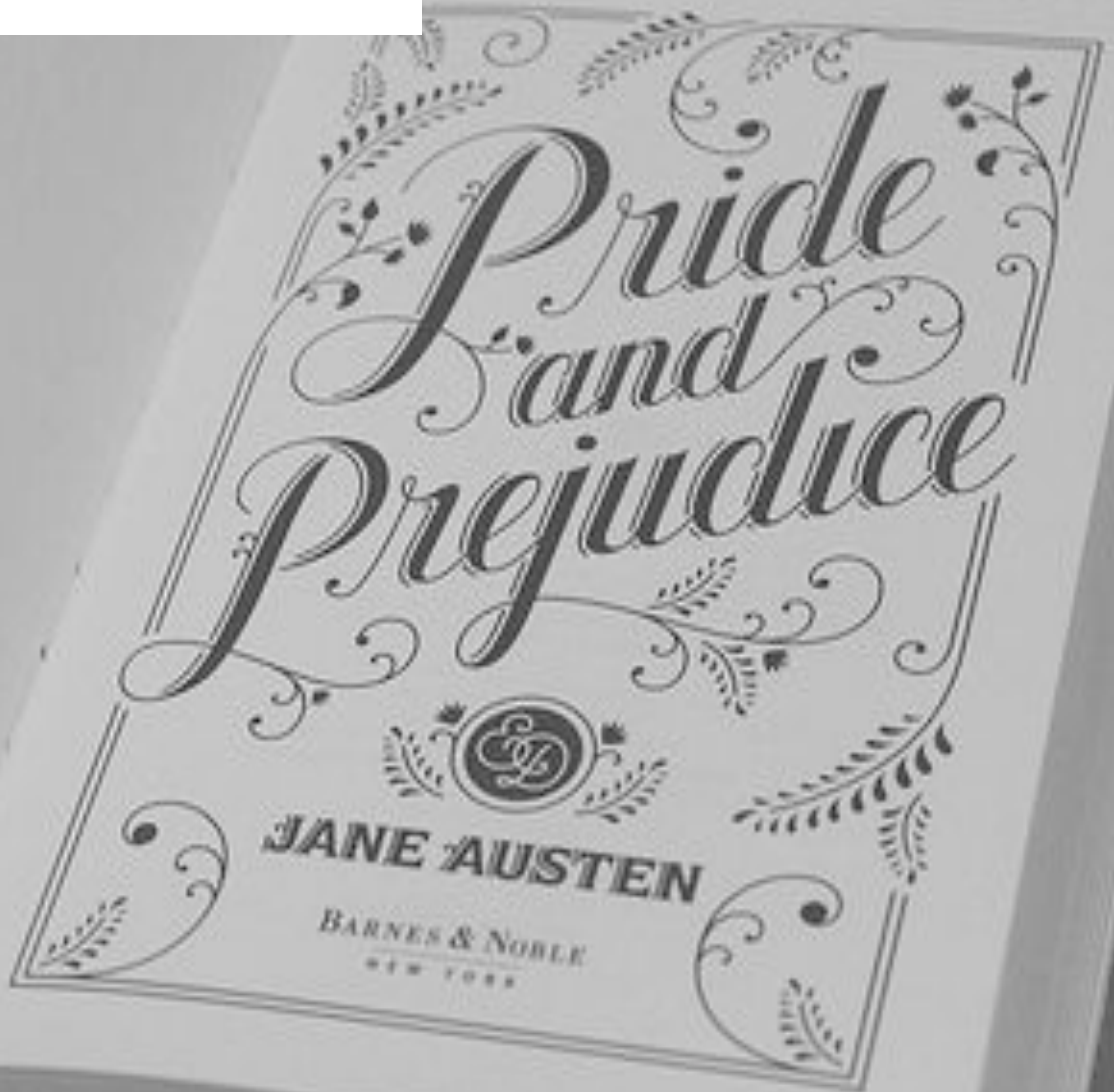
- What did I find out?
  - Not prove yourself right
  - Prove yourself wrong

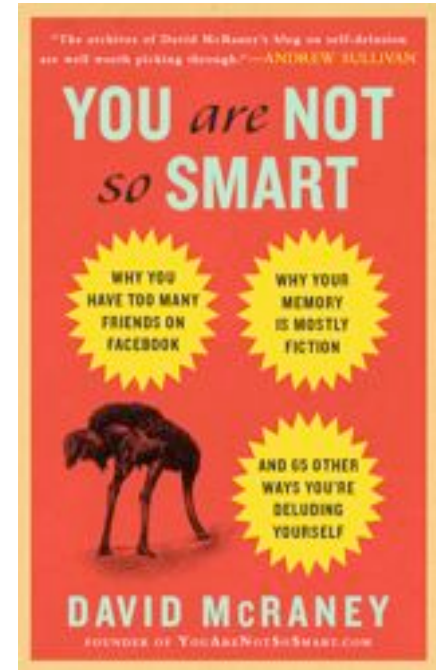- First collect data, then judge / have an opinion
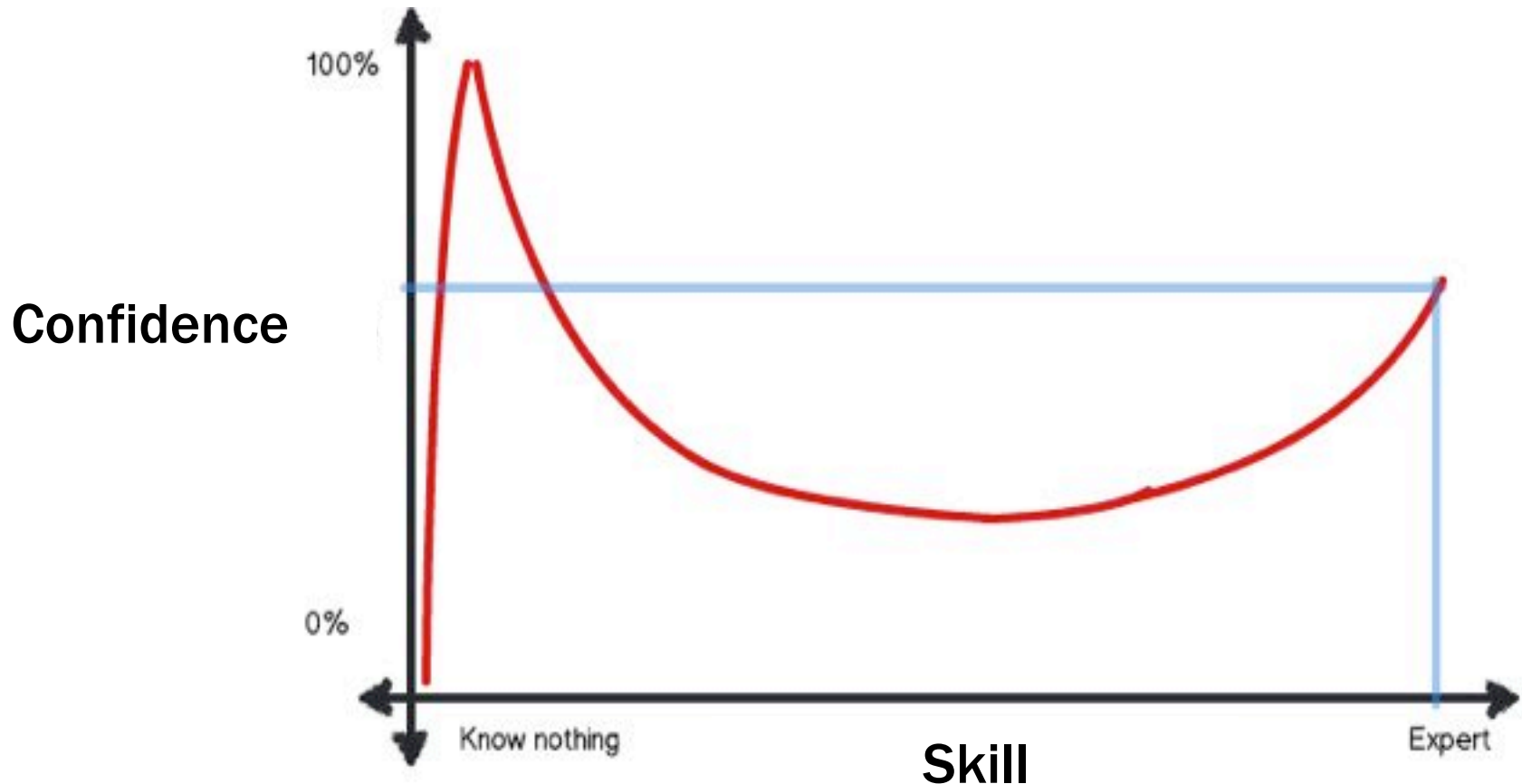
Thinking Fast & Slow
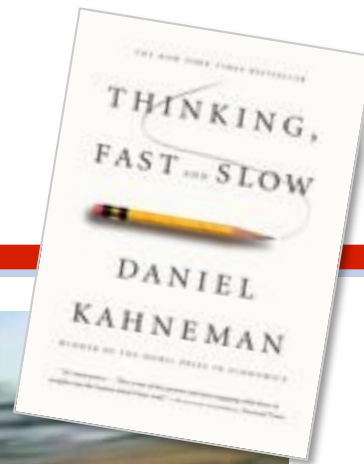
Biases & Fallacies

You are not so smart

- ## Cognitive biases
  Predicable patterns of thought that lead to incorrect conclusions.

- ## Logical fallacies
  Is when you reach a conclusion without knowing all the facts.

- ## Heuristics
  Mental shortcuts to reach a solution used too fast.

Dunning-Kruger Effect

Effect in which incompetent people fail to realise they are incompetent because they lack the skills to distinguish between competence and incompetence.

Dunning-Kruger Effect

Confirmation Bias

You tend to look for information that confirms your beliefs and ignore the information that challenges them.

- Biased search

- Biased interpretation

- Biased memory

Movie Perception Test

Source: http://www.youtube.com/watch?v=6JONMYxaZ_s

Software

Quality

Numbers & counting

CSI?

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Testing is about…

Skills

Experiments

Communication

People

Thinking

Learning

Decision making

Collaboration

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Summary

- Be aware of what you do in testing
- Learn from what people do in social sciences
- Do quantitative AND qualitative research
- Think!
- Be aware of biases and fallacies
- Accept and deal with ambiguity, situational specific results and partial answers

Courseware   Course Info   Discussion   Wiki   Progress   Guests   Think101x Community

◀ ▮▮ ▶

EVIDENCE-BASED EVIDENCE

▶   0:43 / 6:54   ▸ SPEED **1.50x**   🔊   ▱   CC

about next, which is expertise in fingerprint identification. Now you and I spend a lot of our time working on this

stuff. Contrary to what you see on "CSI," it's not computers that match fingerprints

and interpret DNA profiles. It's actually a human.

That's right, and because we're dealing with humans here, that's when things get interesting.

It's not up to a computer. It's not simply a matter of going to a crime scene, dusting

for prints, getting the bloody print, putting it into a computer, and up pops the...

The driver's license of the person who committed the crime.

Download *(Right-Click > Save As)*: 1080p | 720p | 480p | mp3 | Transcript

If you'd like to download this video to watch later on your mobile device, share with your friends, or present to your class, go right ahead!
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Your turn!
Read & think critical about it!
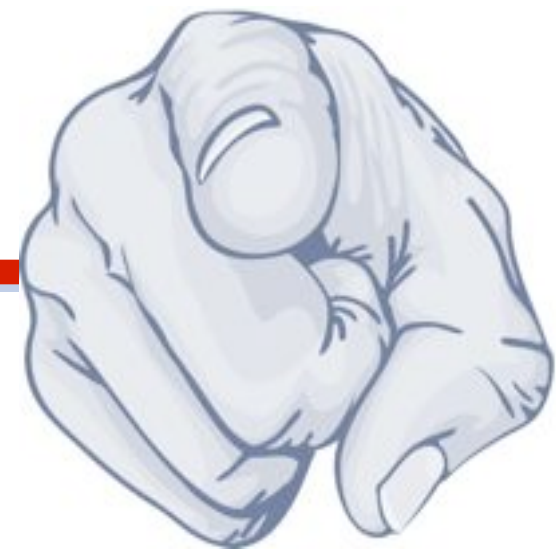
- Think101.org: The Science of Everyday Thinking
- Thinking fast & slow - Daniel Kahneman
- You're not so smart - David McRaney
- Predictably Irrational - Dan Ariely
- The invisible Gorilla - Christopher Chabris and Daniel Simons
- Qualitative Data Analysis: a user-friendly guide for social scientists - Ian Dey
- Critical Thinking: a user's manual – Debra Jackson
- Psychology of Software Testing – John Stevenson (https://leanpub.com/thepsychologyofsoftwaretesting)
- http://steveo1967.blogspot.com/2011/01/are-testers-ethnographic-researchers.html
- http://steveo1967.blogspot.com/2011/01/what-you-believe-might-not-be-true-part.htm
- http://steveo1967.blogspot.com/2010/07/danger-confirmation-bias.html
- http://steveo1967.blogspot.com/2013/03/creative-and-critical-thinking-and.html
- http://usersknow.blogspot.ca/2013/02/combining-qualitative-quantitative.html
- Research Methods: Participant observation (www.sociology.org.uk)
- Critical & creative thinking (http://www.engin.umich.edu/~cre/probsolv/index.htm)
- Software Testing a Social Science – Cem Kaner
- Testing Through The Qualitative Lens – Michael Bolton
- Curing Our Binary Disease – Rikard Edgren
- The Irrational Tester: Avoiding the Pitfalls – James Lyndsay

Acknowledgements

The Psychology
of Software #Testing

John Stevenson

Special thanks to:

John Stevenson

http://www.steveo1967.blogspot.com/
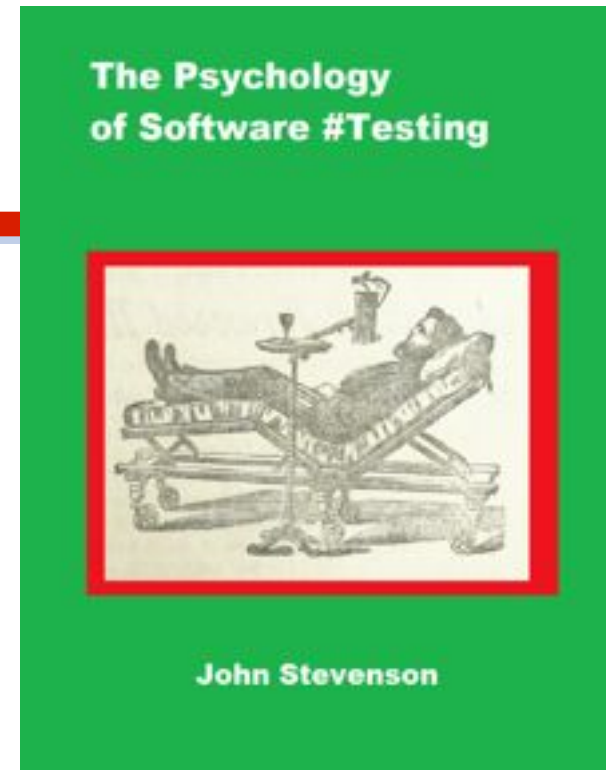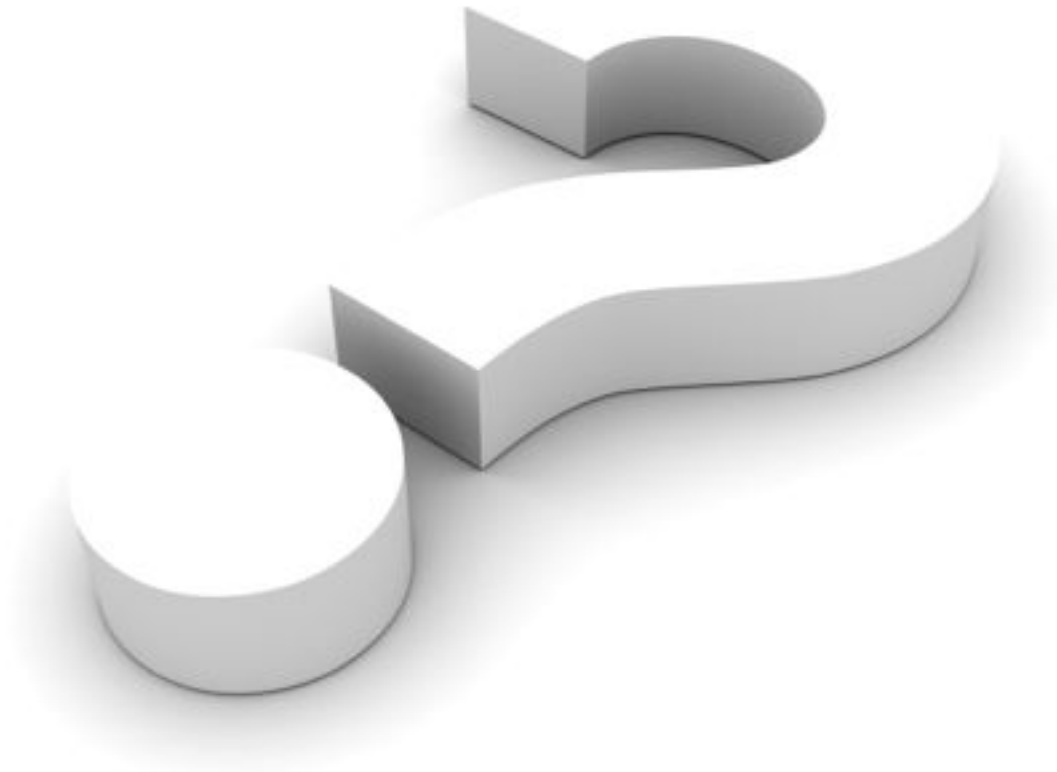
Many of the ideas in this presentation were inspired by colleagues including Cem Kaner, Michael Bolton, James Bach, Rikard Edgren and Jerry Weinberg.

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Questions?

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