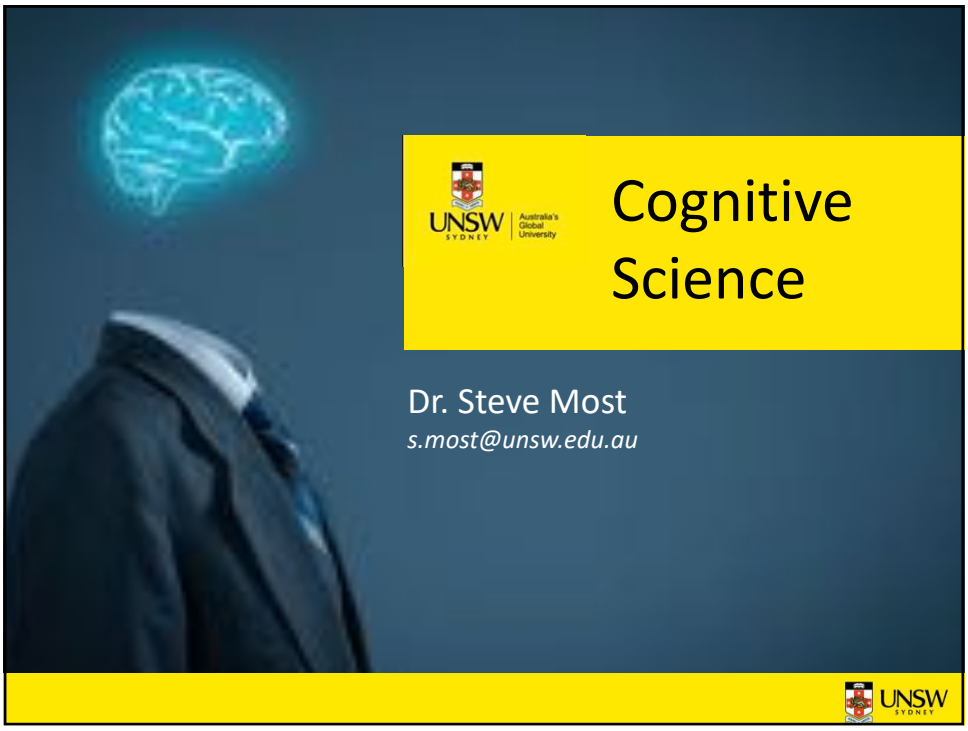
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Australia's Global University
Cognitive Science
Dr. Steve Most
s.most@unsw.edu.au
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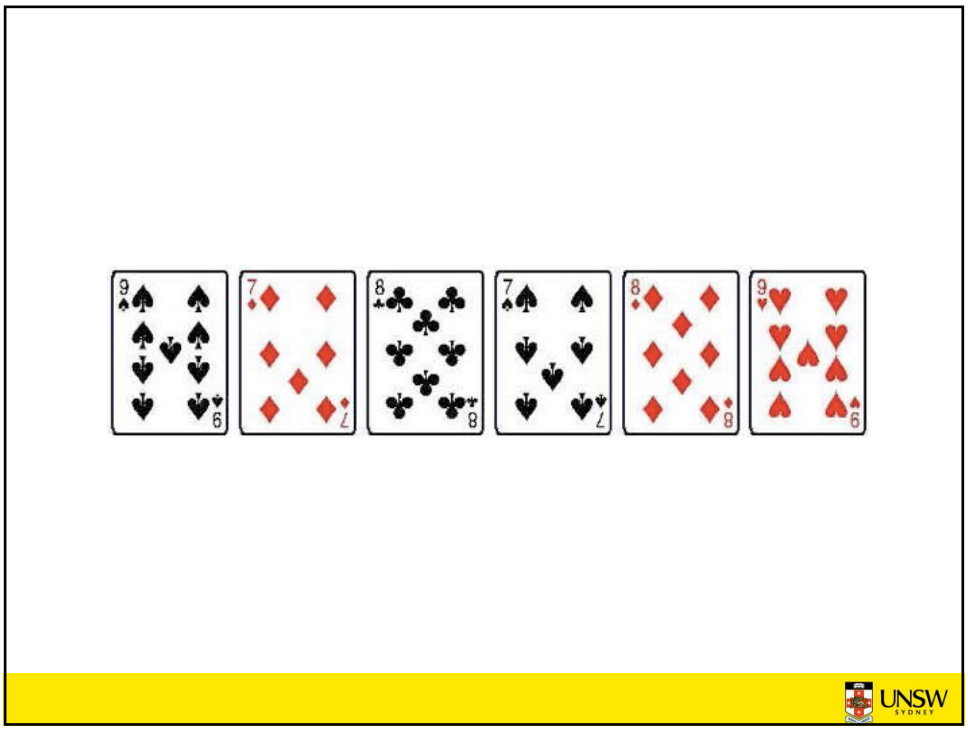
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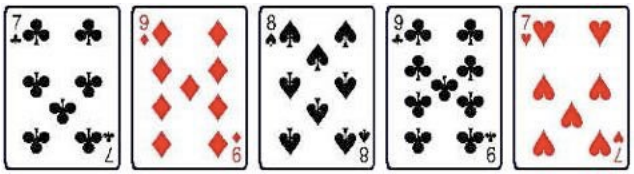
Attention & Awareness



3

COGNITIVE PSYCHOLOGY

How we come to know about the world

encode	(attention, perception)
store	(memory)
use	(decision making, reasoning)

Uses objective measures to build a *science* of how the mind works

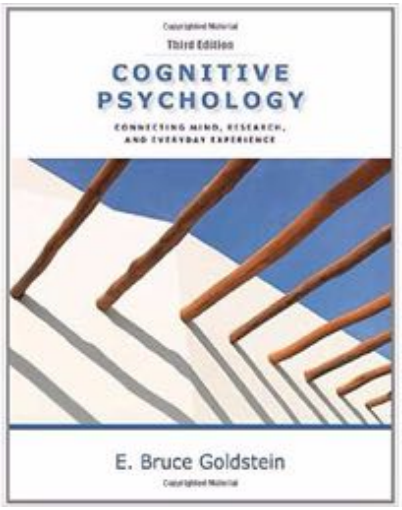
4

What is cognitive psychology?

5

What cognitive processes did you see here?

6



Attention

Memory

Perception

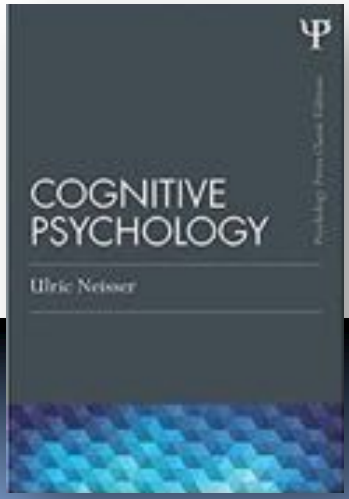
Categorization

Reasoning

Language

Decision Making

7



Ulric Neisser

Cognitive Psychology (1967)

Cognoso: Latin for "to know"

8

The Cognitive Revolution

1950s … 1960s

What were they rebelling against?

9

Introspection

Edward Titchener

The attempt to carefully observe one's own mental experiences as they unfolded

10

Introspection

Edward Titchener

Some problems

Validity

We may not have conscious access to most basic cognitive processes

Fallibility of memory

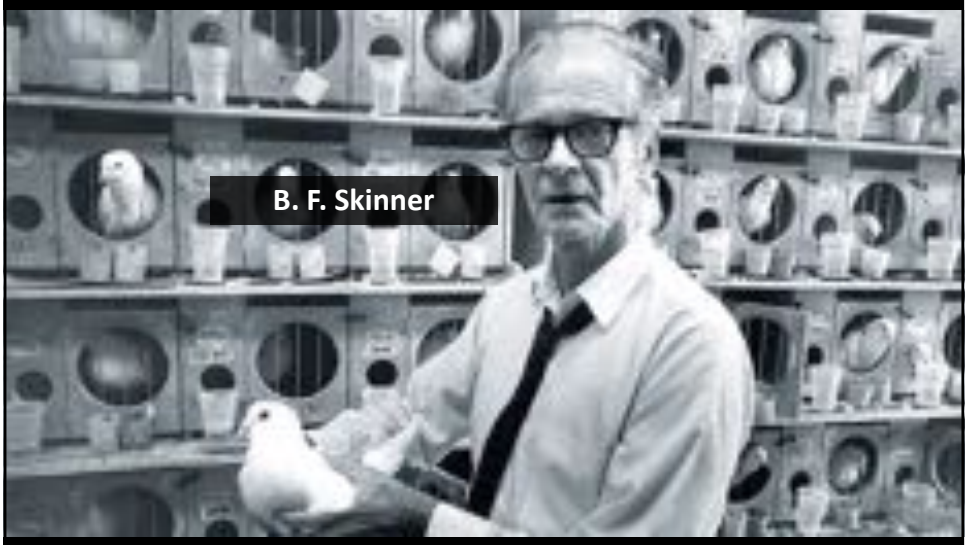
Memory of what we observed in ourselves may not be accurate

Reliability

Subjective observations are hard to replicate from lab to lab

11

Behaviourism



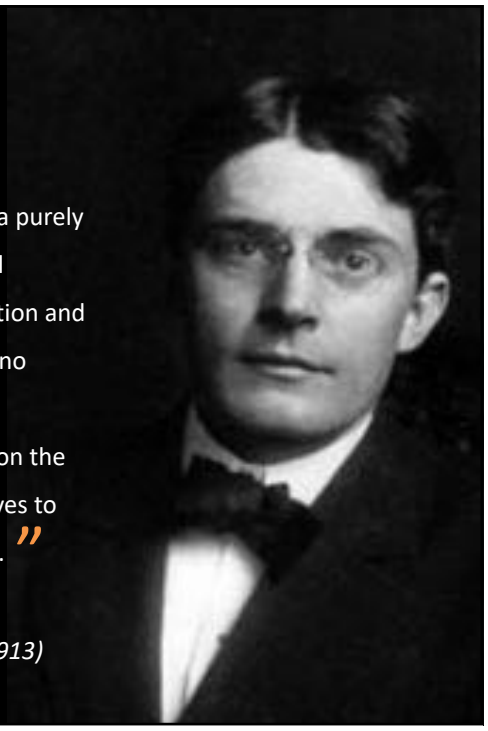
B. F. Skinner

The study of only outward behaviour

12

John Watson

The father of Behaviourism

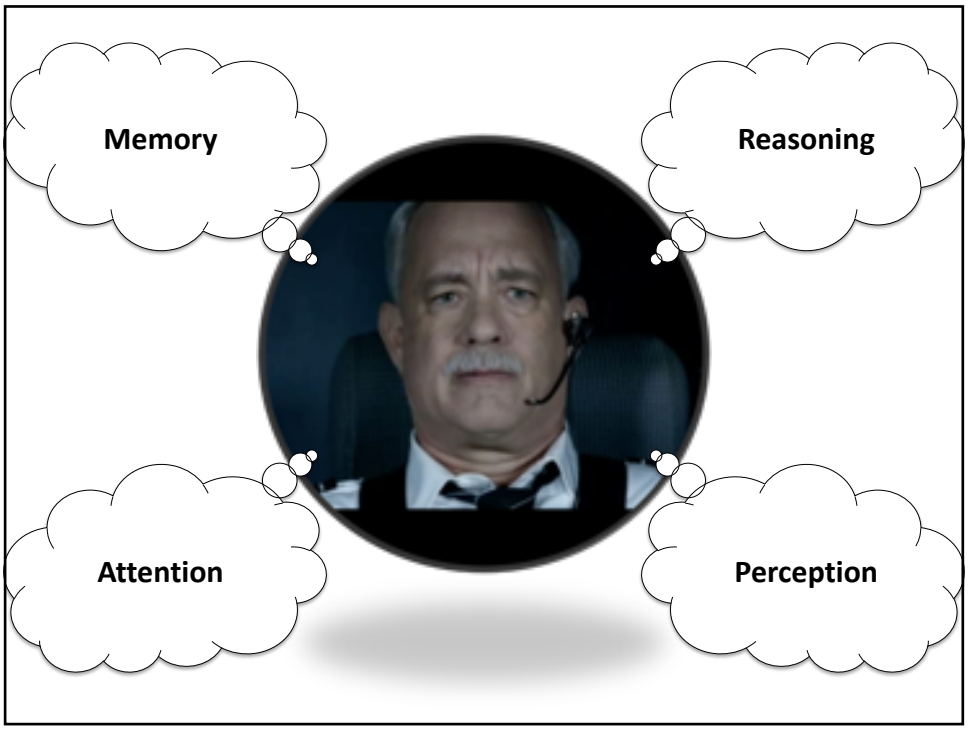


"Psychology as the behaviorist views it is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its methods, nor is the scientific value of its data dependent upon the readiness with which they lend themselves to interpretation in terms of consciousness."

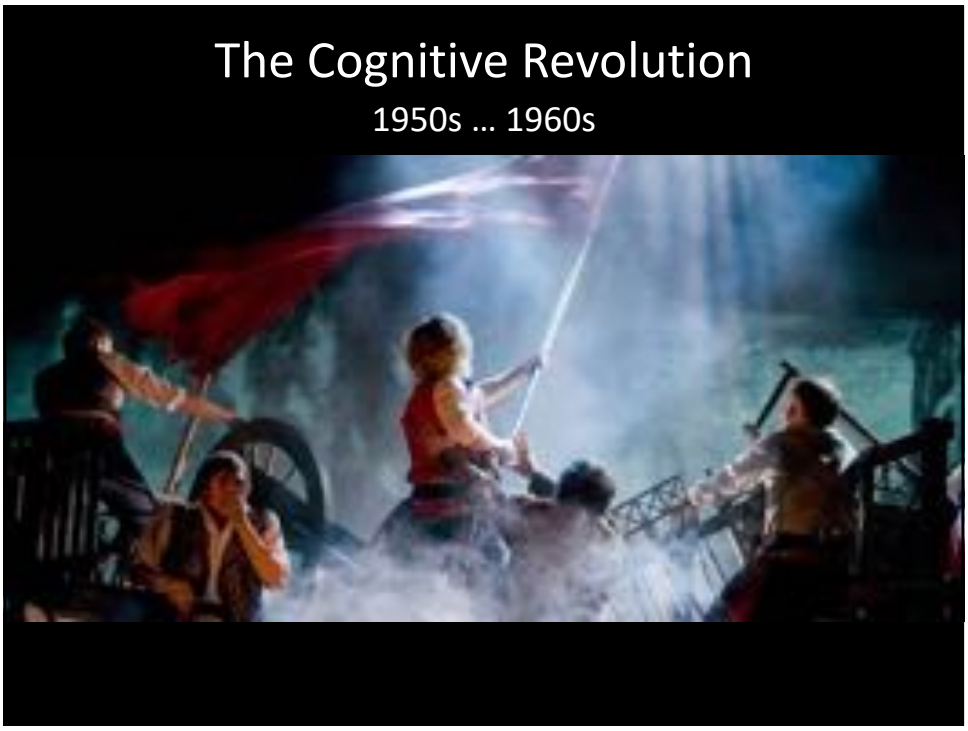
Psychology as the Behaviorist views it (1913)

13

14


Memory
Reasoning
Attention
Perception

15


The Cognitive Revolution
1950s … 1960s

16

Why did Behaviourism begin to crack?

For years, Behaviourists had great success predicting and modifying behaviour without needing to consider "mental" processes

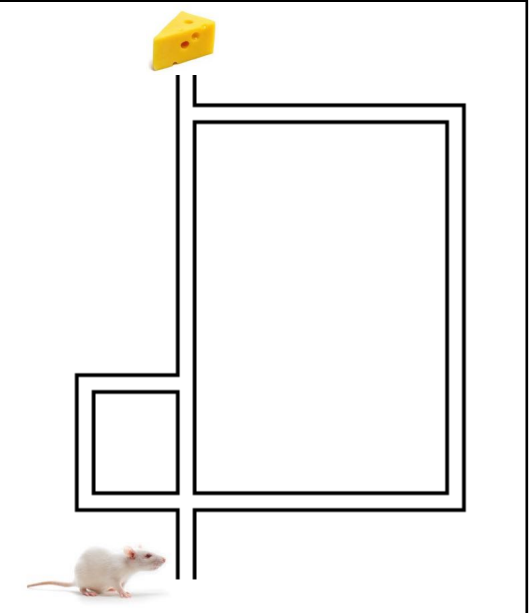
But findings began to emerge that could not be explained without "mental" processing

To fully account for the data, *some* cognitive processes had to be factored in

17

Need to account for *some* cognition

Edward Tolman



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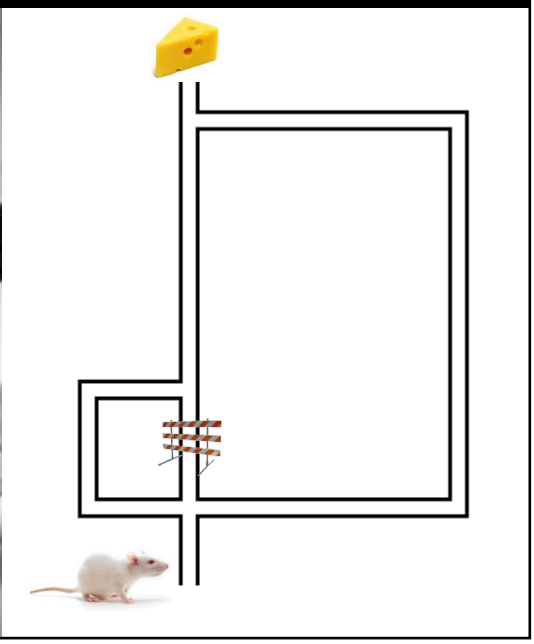
Need to account for *some* cognition



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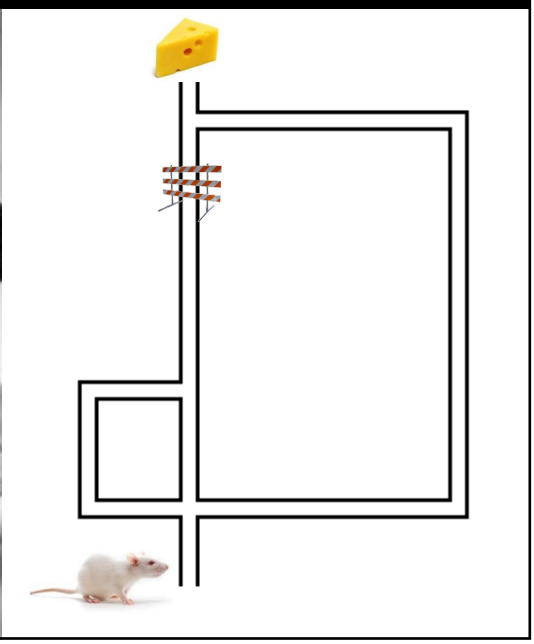
Need to account for *some* cognition



20

Need to account for *some* cognition


Edward Tolman

Rats freely explored maze

After exploration, if shortest route to reward was blocked, they would choose optimal route

They must have developed a ***cognitive map!***

e.g., Tolman (1948)

21

Need to account for *some* cognition

Linguistics *(1959)*

As they learn, children make grammar errors in ways they never would have heard

These errors seem to follow grammar rules, though

As if they cognitively represent language *rules,* which they apply in ways adults don't


Noam Chomsky

22

Need to account for *some* cognition

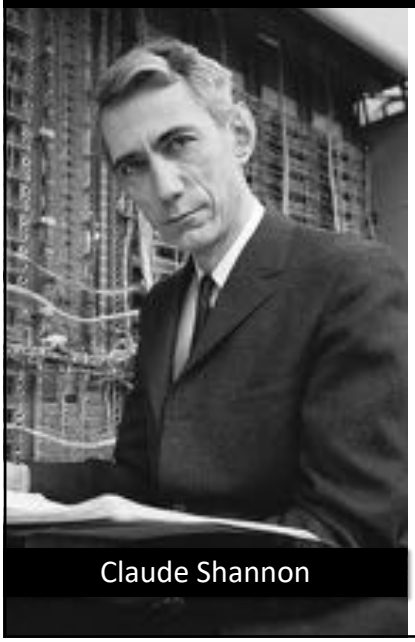
"Overgeneralization"

3-year-old retelling *Star Wars*

Noam Chomsky

23

Influences from outside psychology



Claude Shannon

Information Theory

Engineer & Mathematician at *Bell Telephone Labs*

Studied how messages could be disassembled, transmitted, and reconstructed

Showed that "information" itself could be a fruitful topic of study

A Mathematical Theory of Communication (1948)

24

Influences from outside psychology

Information Theory

Began to make its way into psychology…

Memory as *bits of information stored*

George Miller *(1956)*

Attention as *flow of information through filters*

Donald Broadbent *(1958)*

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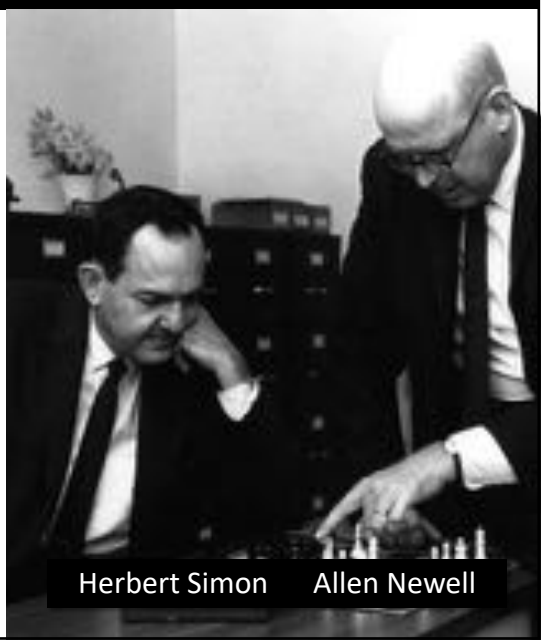
Influences from outside psychology

Computer Science

Programmed simple computers to prove theorems

In 1957, developed a *General Problem Solver* that could solve geometric theorems, arithmetic puzzles, and play chess



Herbert Simon Allen Newell

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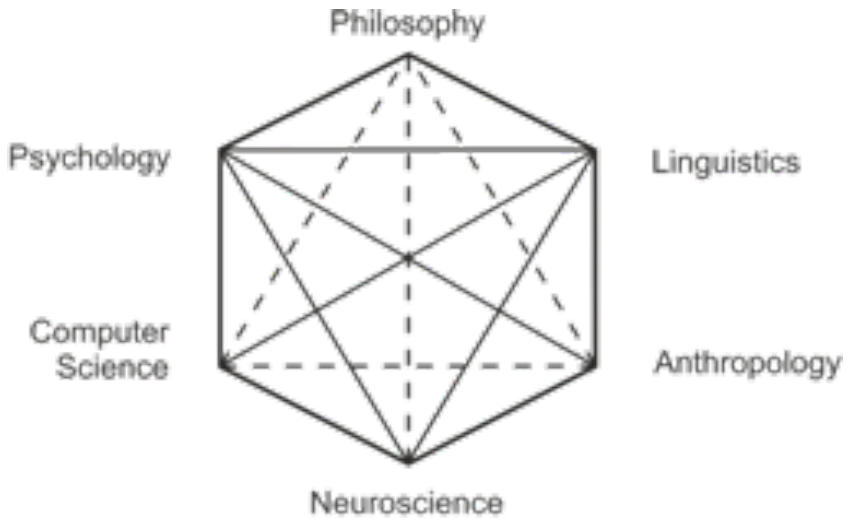
Cognitive Science



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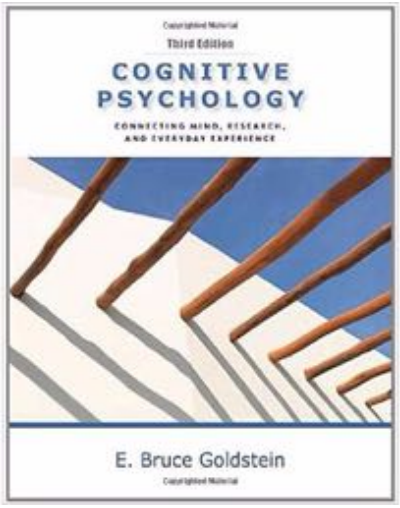

Attention

Memory

Perception

Categorization

Reasoning

Language

Decision Making

These **topics** aren't unique to cognitive psychology

It was the focus on **information** processing that was new

28

Cognition and Reality

29

True or False?

You can implant memories and make people remember something that never happened

True **False**

30

What do we remember?

BED
REST
AWAKE
TIRED
DREAM
WAKE
SNOOZE
BLANKET
DOZE
SLUMBER
SNORE
NAP
PEACE
YAWN
DROWSY

Memory is **not** like a video recorder

We rebuild our memories each time we try to remember

31

Loftus & Pickrell, 1995

1. Were told 3 true events and 1 false event (lost in mall) that happened to them as child
2. Interview 1: "Reminded" of the 4 events and wrote everything they could remember
3. Interview 2 (2 weeks later): Asked to remember events and identify false event
4. Several (but not all) participants thought false event was real

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Implications for eyewitness testimony

33

Study tip!

34

True or False?

Staring at one colour will make you see the opposite colour when looking at something colourless

True **False**

35

36

37

True or False?

"Seeing" is something that the eyes do. We use our mind to interpret what we've seen.

True **False**

38

39

Simons & Levin, 1998

40

Implications for public safety

41

42

True or False?

Babies can hear differences in speech sounds that adults cannot

True **False**

43

Kuhl et al., 1992

1. Heard same phoneme repeatedly, learned to turn head upon hearing new phoneme
2. 6-8 month olds: American & Japanese babies good at distinguishing /l/ from /r/
3. 10-12 month olds: American babies improved, Japanese babies got worse
4. Babies learn to distinguish language sounds through social immersion

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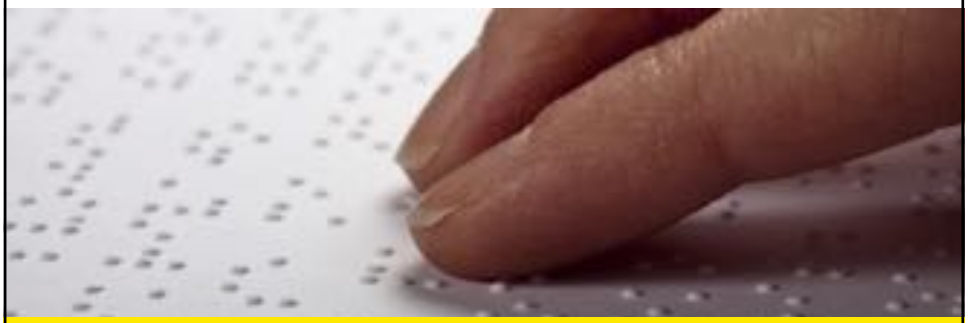
Implications for education & development

45

True or False?

When a person who is blind reads Braille, they activate brain regions usually involved in vision

True **False**



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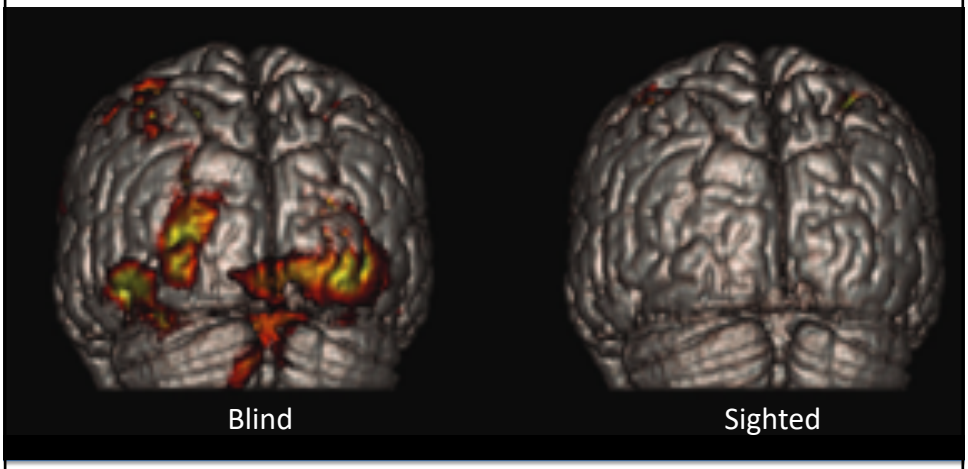
Sadato, 2005



Functional Magnetic Resonance Imaging (fMRI)

Cognitive Neuroscience

47

functional MRI

48

49

Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

50

Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

51

Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

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Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

53

Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

54

Implicit Association Test

Clap if it's a **hero** … **Snap** if it's a **villain**

55

Implicit Association Test

Clap if it's a **positive word**… **Snap** if it's a **negative word**

LOVE

56

Implicit Association Test

Clap if it's a **positive word**… **Snap** if it's a **negative word**

WAR

57

Implicit Association Test

Clap if it's a **positive word**… **Snap** if it's a **negative word**

HATE

58

Implicit Association Test

Clap if it's a **positive word**… **Snap** if it's a **negative word**

HAPPY

59

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

HAPPY

60

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

61

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

62

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

HATE

63

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

64

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

LOVE

65

Implicit Association Test

Clap if it's a **hero** or a **positive word**
Snap if it's a **villain** or a **negative word**

66

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

67

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

WAR

68

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

69

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

LOVE

70

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

HATE

71

Implicit Association Test

Clap if it's a **hero** or a **NEGATIVE word**
Snap if it's a **villain** or a **POSITIVE word**

72

Implicit Association Test

Clap for a **White person** or a **NEGATIVE word**

Snap for an **Black person** or a **POSITIVE word**

73

Implicit Association Test

Clap for a **Muslim person** or a **NEGATIVE word**

Snap for an **Non-Muslim person** or a **POSITIVE word**

74


Mahzarin Banaji
https://implicit.harvard.edu/implicit/
Test yourself!

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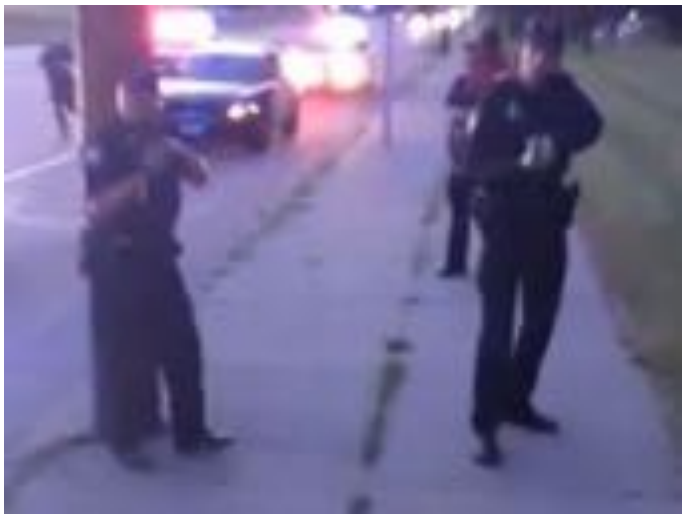

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Police Officer's Dilemma

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RESEARCH ARTICLE

The Effect of Framing and Normative Messages in Building Support for Climate Policies

Mark J. Hurlstone[1,2*], Stephan Lewandowsky[1,3], Ben R. Newell[4], Brittany Sewell[1]

1. School of Psychology, University of Western Australia, Crawley, Australia, 2. Centre for Environment and Life Sciences, Commonwealth Scientific and Industrial Research Organisation, Floreat, Australia, 3. Department of Experimental Psychology, University of Bristol, Bristol, United Kingdom, 4. School of Psychology, University of New South Wales, Sydney, Australia

Detecting misinformation in online social networks using cognitive psychology

K P Krishna Kumar and G Geethakumari

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Informatics in Radiology

What Can You See in a Single Glance and How Might This Guide Visual Search in Medical Images?[1]

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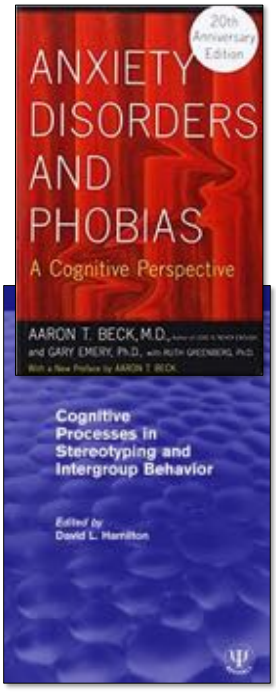

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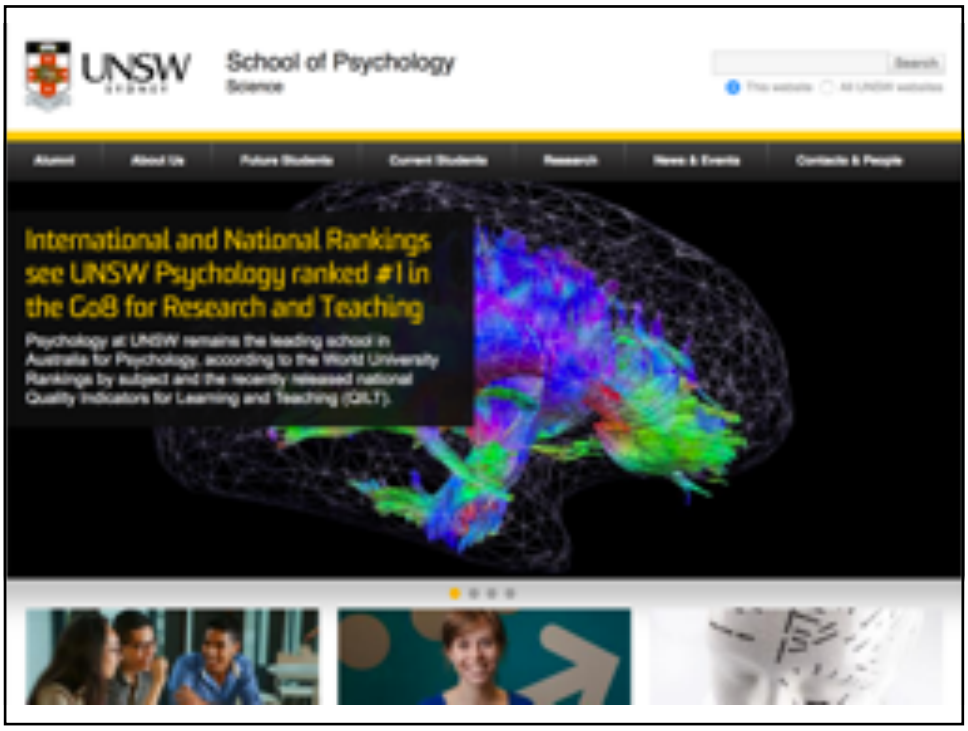
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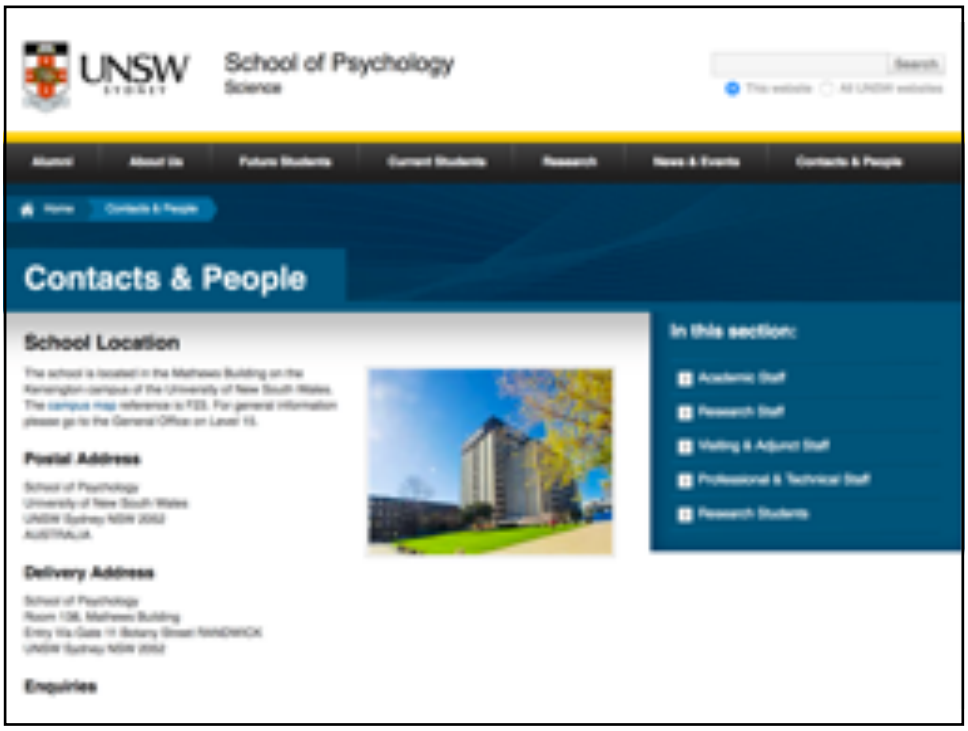
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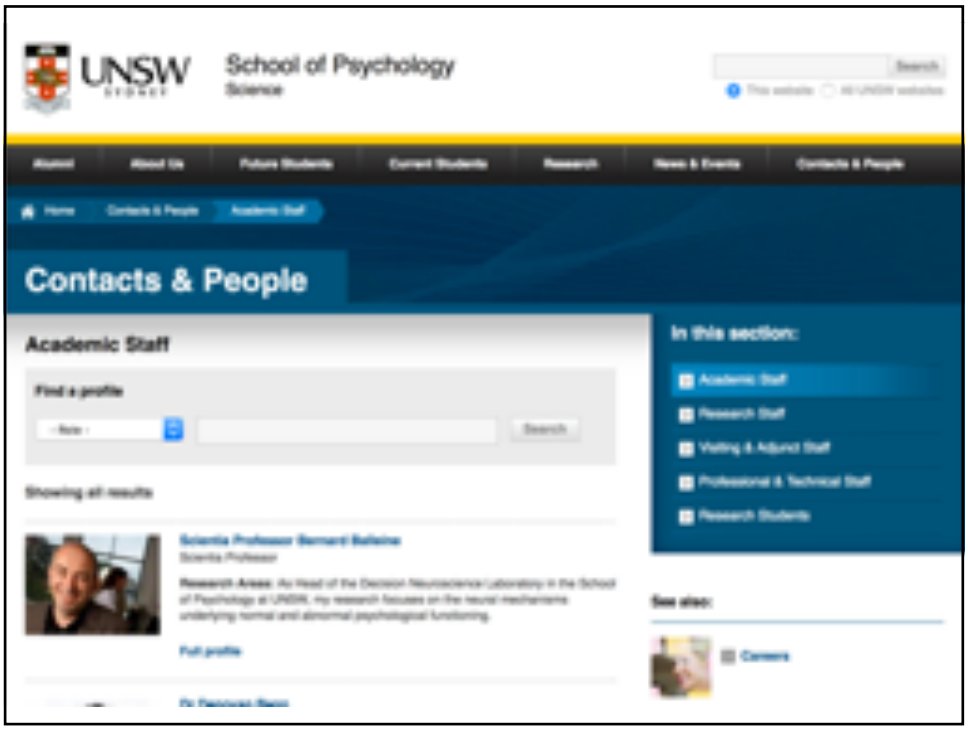
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