

The Explicit and the Implicit:  
Unconscious Mental States

Fall 2014

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Midterm Exam

- Wednesday, October 22
  - In-Class Review Monday, October 20
- Students with Disability Accommodations
  - Details via Email

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All Lectures and Required Readings  
To Date

- 15-20 Short-Answer Questions
  - Each Question Worth 3-4 Points
  - 4 Sentences *Maximum*
- Covers:
  - Introduction
  - Introspection
  - Mind and Body
  - Attention and Automaticity
  - The Explicit and the Implicit

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## Resources for Exam

- Q&A Session in Class October 20
- Materials on Course Website
  - Lecture Illustrations, Supplements
  - Exam Information, Narrative Review
  - Past Exams (with Scoring Guides)
- Post questions to bSpace Forum
  - By 12:00 Noon Tuesday, October 21

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## Two Kinds of Consciousness?

Block (1990, 1995, 2007)

- Phenomenal Consciousness
  - Experiential States
- Access Consciousness
  - Information Interacts with Conscious States
- P-Consciousness w/o A-Consciousness?
  - Background Noise
- A-Consciousness w/o P-Consciousness
  - Blindsight?



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## The Contradiction of the Unconscious

Kant, *Anthropology from a Pragmatic Point of View* (1798)

**To have ideas, and yet not be conscious of them, --**

there seems to be a contradiction in that; for how can we know that we have them, if we are not conscious of them?

Nevertheless, we may become aware indirectly that we have an idea, although we be not directly cognizant of the same.



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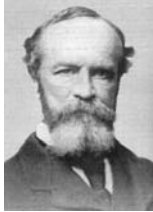
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## A Tumbling-Ground for Whimsies?

James, *Principles of Psychology* (1890), p. 163



The distinction... *between the unconscious and the conscious being of the mental state...* is the sovereign means for believing what one likes in psychology, and of turning what might become a science into a tumbling-ground for whimsies.

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## Implications of Attention and Automaticity

- Mental Processes can be Unconscious
  - Especially Preattentive or Automatic
- Mental States are Conscious
  - Beliefs, Feelings, Desires
    - Percepts, Memories, Images, Thoughts
- Role of Conscious Mental States
  - Evoke Unconscious, Automatic Processes
  - Created by Unconscious, Automatic Processes

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## Can Mental States Be Unconscious?

Can  
Beliefs, Feelings, Desires  
Percepts, Memories, Thoughts  
Feelings, Emotions,  
Goals, Motives  
Influence Experience, Thought, Action  
In the Absence of...  
(or Independent of...)  
Conscious Awareness

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## What Do We Mean by Mental States?



- Brentano: Intentionality is the Mark of the Mental

- Intentionality = “Aboutness”



- James: Mental States Deal with Objects Independent of Themselves

- Cognitive, Possess Function of Knowing



- Searle: Mental States Have Content

- Refer to Specific Feature of the World

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## Conscious and Unconscious Mental States

- In the Cognitive Domain
  - Perceiving, Remembering, Knowing, Thinking
- When Conscious, Have Intentionality
- Unconscious Mental States
  - Must Also Have Intentionality

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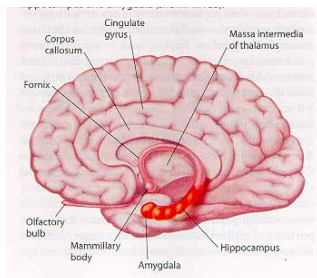
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## The Amnesic Syndrome

“Korsakoff’s Syndrome”

- Bilateral Brain Damage
  - Medial Temporal Lobe
    - Hippocampus
  - Diencephalon
    - Mammillary Bodies
- Specific Memory Deficit
  - Anterograde Amnesia
    - “Postmorbid” Events
  - Retrograde Amnesia (?)
    - “Premorbid” Events



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## Memory in the Amnesic Syndrome

Warrington & Weiskrantz (1968)



### Study List

Ashcan  
Bellhop  
Cleanser  
Dark  
Expert  
Follow  
Grapevine

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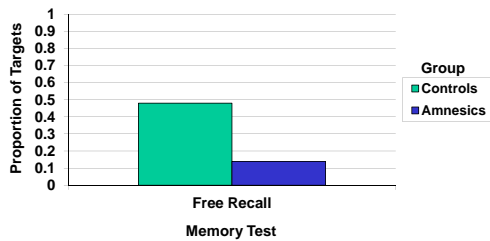
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## Memory in Amnesia

After Warrington & Weiskrantz (1970)



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## Recognition in the Amnesic Syndrome

Warrington & Weiskrantz (1968)

### Targets

Ashcan  
Bellhop  
Cleanser  
Dark  
Expert  
Follow  
Grapevine

### Lures

Ashtray  
Bellows  
Clearance  
Dunk  
Expense  
Fellow  
Granite

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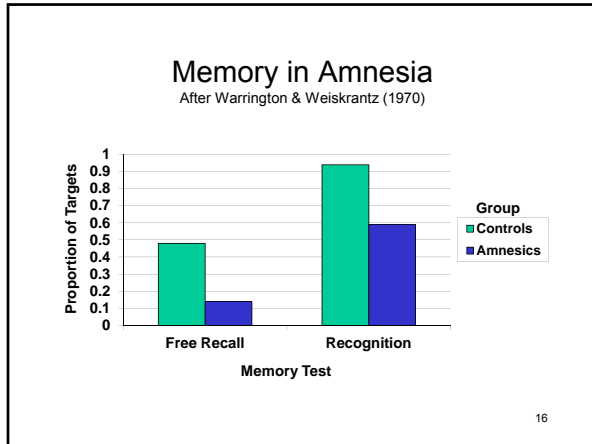
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### Anterograde Amnesia as Learning Failure

- “Loss of Memory”
  - Loss of New Learning
- Can Amnesic Patients Learn?
  - “A Relatively Permanent Change in Behavior that Occurs as a Result of Experience”

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### “Guessing Game”

- Word-Stem Completion
 

I’m thinking of a word that begins with these three letters. Can you fill in the blanks?

Ash_____	Bel_____
Cle_____	Exp_____
- Word-Fragment Completion
 

I’m thinking of a word that has these letters in it. Can you fill in the blanks?

D__k	F_l_w
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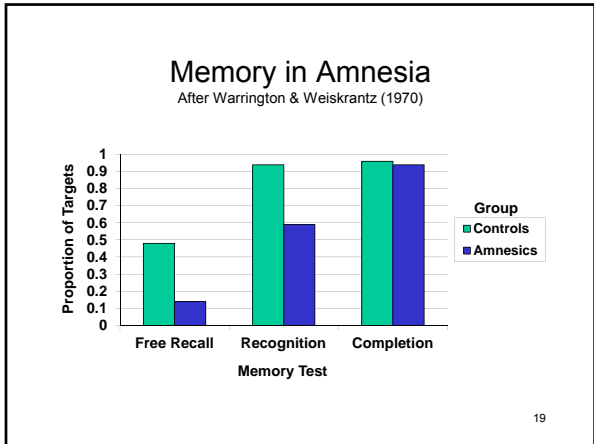
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- ### Priming
- Processing of One Item Influences Processing of Another Item
    - “Learning” in the Broadest Sense of Term
  - Two Forms
    - Positive
      - Facilitates Processing
    - Negative
      - Inhibits Processing
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- ### Explicit vs. Implicit Memory
- After Schacter (1987)
- 
- Explicit Memory
    - Conscious Recollection
    - Recall, Recognition
  - Implicit Memory
    - Any Effect on Experience, Thought, Action
      - Attributable to Past Event
    - Priming Effects
  - Priming Effects Occur in the Absence of Conscious Recollection
    - Represent Unconscious memory
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## Repetition Priming

- The item presented at the time of testing is a full or partial recapitulation of the item presented during study
- Examples
  - Stem-Completion            Ash\_\_
  - Fragment-Completion      A\_h\_\_n
  - Perceptual Identification   
  - Lexical Decision            Ashcan
- Bias in Information-Processing
  - Based on Memory Trace of Prior Experience <sup>22</sup>

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## Test Format

Control Nature of the Cues During Test

- Stem-Cued Recall
  - Remember a Word on the List Beginning with *Gra*\_\_\_\_\_
- Stem Completion
  - The First Word You Can Think of Beginning with *Gra*\_\_\_\_\_

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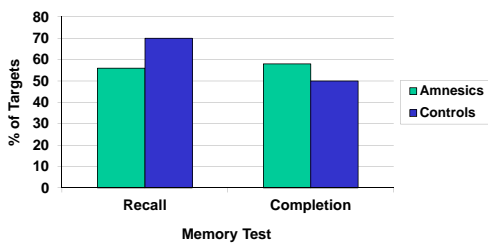
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## Explicit and Implicit Memory in the Amnesic Syndrome

Graf, Squire, & Mandler (1984)



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## Explicit and Implicit Memory in Amnesia

- Amnesic Syndrome
- Electroconvulsive Therapy for Depression
- Conscious Sedation for Outpatient Surgery
- General Anesthesia for Major Surgery
- Posthypnotic Amnesia
- Dissociative Disorders
  - e.g., Multiple Personality Disorder
    - Genuine Cases! (Mostly)

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## Explicit and Implicit Memory in “Normal”, “Intact” Subjects

- Savings in Relearning
  - Nelson (1978)
    - Paired-Associate Learning
    - Significant Savings in Absence of Recognition
- Priming Effects
  - Jacoby & Dallas (1981)
    - Word Identification
    - Priming Dissociated From Recognition

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## Levels of Processing

Jacoby & Dallas (1981)

- Study Phase
  - “Shallow” Orthographic Processing
  - “Deep” Semantic Processing
- Memory Tests
  - Recognition
  - Perceptual Identification

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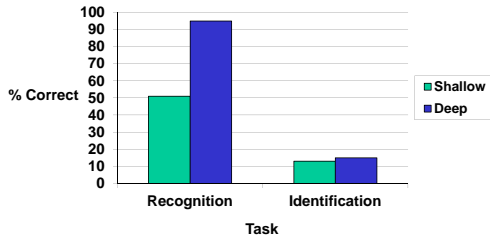
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## Priming in Perceptual Identification

Jacoby & Dallas (1981), Experiment 1



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## Dissociations Between Explicit and Implicit Memory

- Population Dissociations
  - Amnesia
    - Affects Explicit, Not Implicit
- Functional (Experimental) Dissociations
  - Level of Processing
    - Affects Explicit > Implicit
  - Modality Shift
    - Affects Implicit > Explicit

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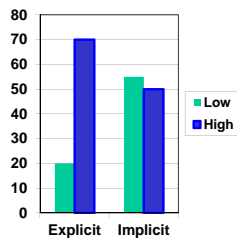
## Single Dissociation

Teuber (1955)



Independent Variable A

- Affects Explicit
- Does Not Affect Implicit



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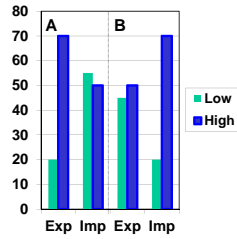
## Double Dissociation

Teuber (1955)



### 2 Independent Variables

- A Affects Explicit
  - Does Not Affect Implicit
- B Affects Implicit
  - Does Not Affect Explicit
- "Twin Dissociation"
  - Two Single Dissociations
- Also *Triple* Dissociations



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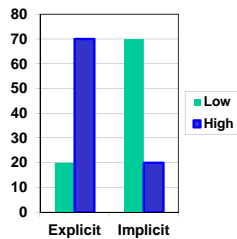
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## Crossover Dissociation

### Independent Variable A

- Improves Explicit
- Impairs Implicit



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## Terminological Confusion

- Explicit vs. Implicit Memory
  - Why Not *Conscious* vs. *Unconscious*?
- Direct vs. Indirect Memory
- Declarative vs. Procedural Memory
  - Declarative vs. Nondeclarative Memory

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## Two Kinds of Representations

Anderson (1995)

- Perception-Based (Mental Images)
  - Represent Physical Structure of Event
    - Physical Appearance of Object
    - Spatio-Temporal Configuration of Object, Features
- Meaning-Based (Propositional)
  - Represent Meaning of Event
    - Semantic Relations Among Objects, Features

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## Semantic Priming in Amnesia

- Category Priming
  - Tree-Oak
- Associative Priming
  - Table-Chair
- Idiomatic Associates
  - Sour-Grapes

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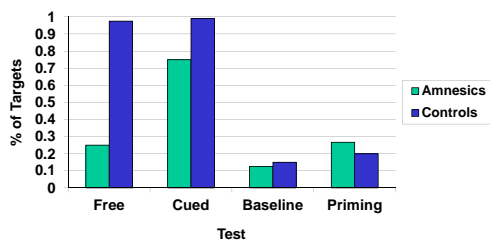
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## Category Priming in Amnesia

Gardner, Boller, Moreines, & Butters (1973)



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## Relations Between Perceptual and Conceptual Priming

<u>Test</u>	<u>Perceptual</u>	<u>Conceptual</u>
Stem-Completion	ashtray - ash__	cigarette - ash__
Fragment Completion	follow - f_l__w	lead - f_l__w
Perceptual Identification	nurse - <del>nurse</del>	doctor - <del>nurse</del>
Lexical Decision	nuse - nruse	doctor - nruse

**Study - Test**

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## Implications of Implicit Memory

- Implicit Memory is Unconscious Memory
  - Can be Dissociated from Explicit Memory
- Can Explicit-Implicit Distinction be Extended?
  - Other Domains of Cognition
    - Perception, Thought, Learning
  - Other Domains of Mental Life
    - Emotion, Motivation

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## Implicit Memory and Implicit Perception

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| <ul style="list-style-type: none"> <li>• An Effect of a <i>Past</i> Event</li> <li>• On Experience, Thought, or Action</li> <li>• In the Absence of (or Independent of) Conscious <i>Recollection</i> of that Event</li> </ul> | <ul style="list-style-type: none"> <li>• An Effect of a <i>Current</i> Event*</li> <li>• On Experience, Thought, or Action</li> <li>• In the Absence of (or Independent of) Conscious <i>Perception</i> of that Event</li> </ul> |
|--|--|

\*or an Event in the Very Immediate Past  
(James's "Specious Present")

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### Does the *Limen* Exist?

Leibnitz (1704); Herbart (1816)



- Conscious Perceptions Built Up from Unconscious Perceptions
  - *Petites Perceptions*
- Limen (Threshold) for Conscious Perception
  - Unconscious Perceptions Have Effect on Consciousness
  - Ideas as well as Percepts

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### Does the *Limen* Exist?

Peirce & Jastrow (1884)



- Comparative Judgments
  - Weight
  - Brightness
- Confidence Rating
- Forced Choice at Zero Confidence

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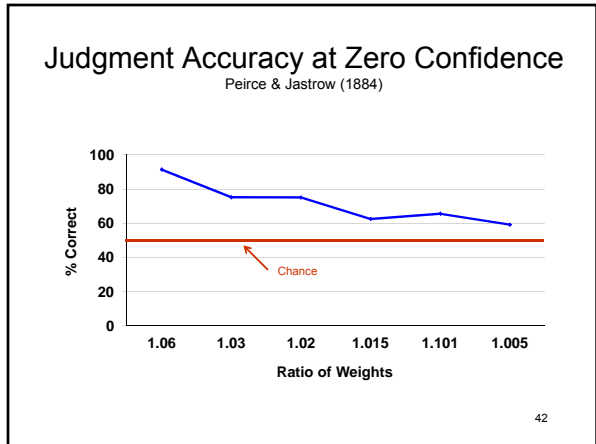
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## Criticisms of Subliminal Research

Eriksen (1958, 1960); Goldiamond (1958); Holender (1986)

- The Threshold Bugaboo
  - Threshold-Setting Procedures
    - If Inadequate, Stimuli Not Truly Subliminal
  - Implications of 50% Detection
    - “Subliminal” Stimuli Still Detected Some of the Time
- Theoretical Blinders
  - Subliminal Perception Confined to “Preattentive” Perceptual Analyses
    - Cannot Extend to Semantic Analyses

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## Masked Priming Paradigm

Marcel (1983)

- Semantic Priming Effects
    - Lexical Decision
    - Perceptual Identification
- Doctor -- NURSE*
- Target Presented Supraliminally
  - Prime Presented “Subliminally”
    - ~~Brief or Weak Exposure~~
    - Masked Exposure

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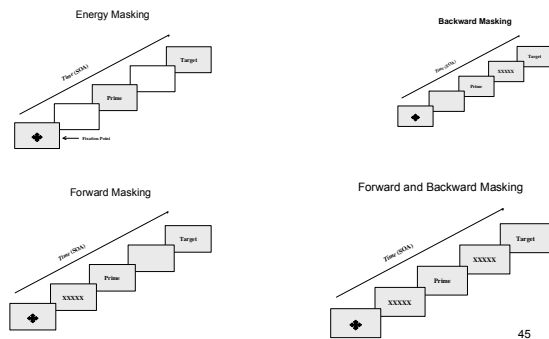
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## Varieties of Masking



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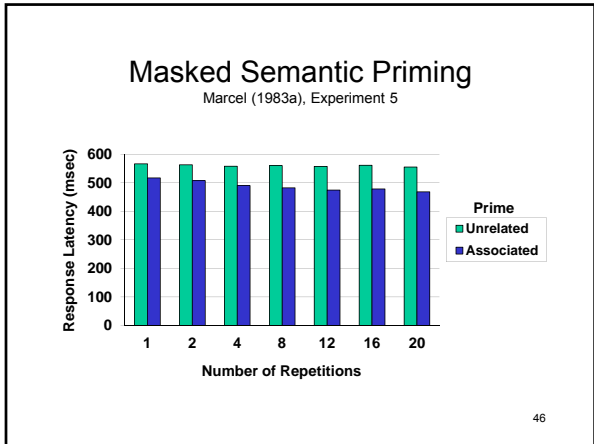
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### The Subliminal Stroop Effect

Marcel (1983a), Experiment 3

- Subject's Task
  - Identify Patch of Color

- Color Word Embedded in Patch
  - Congruent or Incongruent
  - Masked
    - Short vs. Long SOA between Word and Mask

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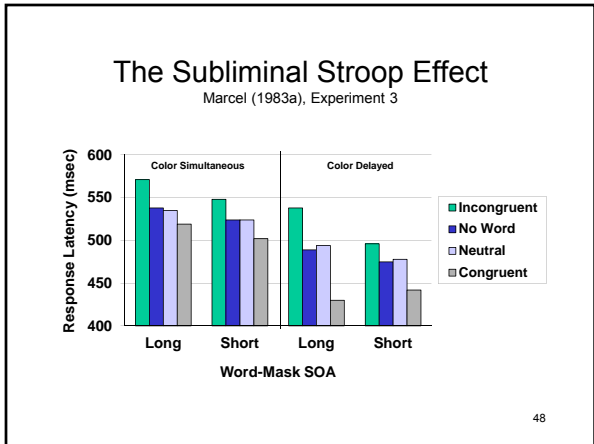
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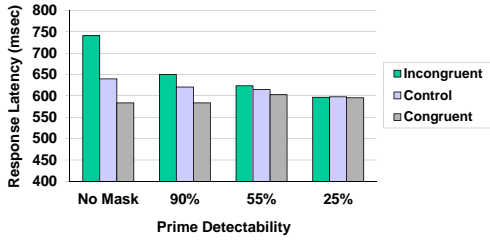
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## The Subliminal Stroop Revisited

Cheesman & Merikle (1984), Experiment 1



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## Objective and Subjective Thresholds in Theory

Cheesman & Merikle (1985, p. 333)

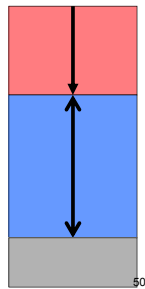
Threshold    Priming

"The detection level where subjects claim not to be able to discriminate perceptual information at better than chance level"

Subjective

"The level of detectability where perceptual information is actually discriminated at chance levels"

Objective



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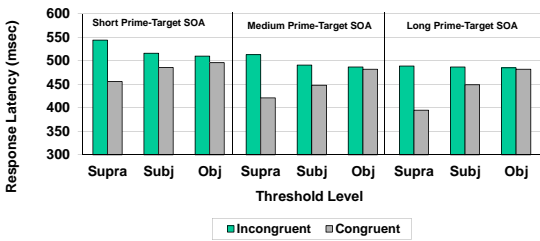
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## Subjective and Objective Thresholds in Practice

Cheesman & Merikle (1984), Experiment 2



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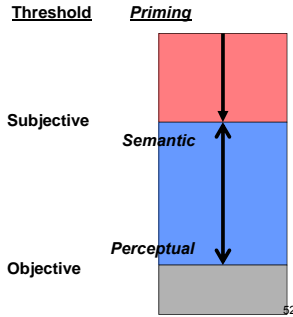
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## Objective and Subjective Thresholds in Theory

Cheesman & Merikle (1985, p. 333)

"The detection level where subjects claim not to be able to discriminate perceptual information at better than chance level"

"The level of detectability where perceptual information is actually discriminated at chance levels"




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## Implicit Perception Beyond the Subliminal

- Implicit Perception Can Occur When the Stimuli are Clearly Supraliminal
  - Suprathreshold Intensity
  - Unmasked (Typically)
- Neurological Patients
  - Blindsight, Neglect, Prosopagnosia
- Normal, Neurologically Intact Subjects
  - Attention Directed Elsewhere
  - Limitations on Attentional Processing

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## Patient D.B.'s Scotoma

Weiskrantz

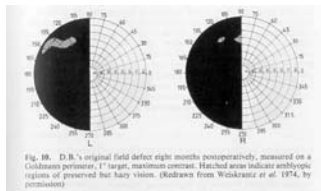


Fig. 10. D.B.'s original field deficit eight months postoperatively, measured on a Goldmann perimeter, 1° target, maximum contrast. Hatched area indicates anisopic regions of preserved but hazy vision. (Redrawn from Weiskrantz et al. 1974, by permission)

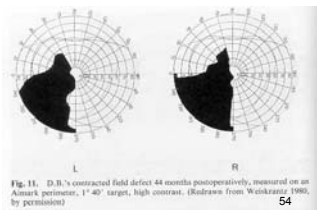


Fig. 11. D.B.'s contracted field deficit 48 months postoperatively, measured on an Alcock perimeter, 1° 40' target, high contrast. (Redrawn from Weiskrantz 1980, by permission)

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## Evidence for "Blindsight" in D.B.

Weiskrantz (1986)

### "Guesses" Above Chance Level

- Presence vs. Absence
  - Location
  - Form
- Movement
  - Velocity
- Orientation
  - Size

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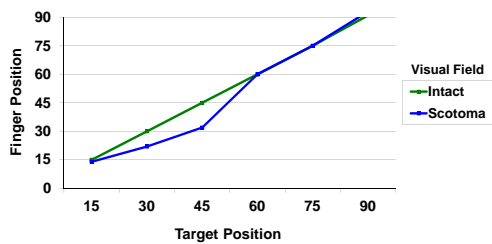
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## Finger-Pointing Performance by D.B.

Weiskrantz (1986)



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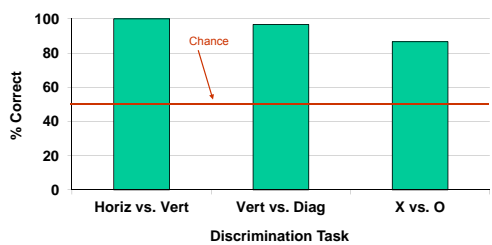
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## Perception of Orientation by D.B.

Weiskrantz (1986)



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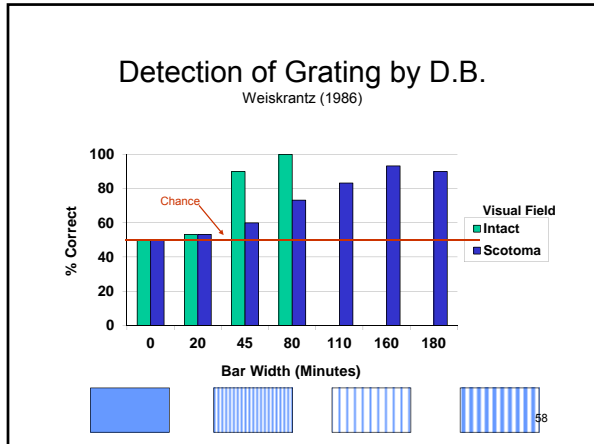
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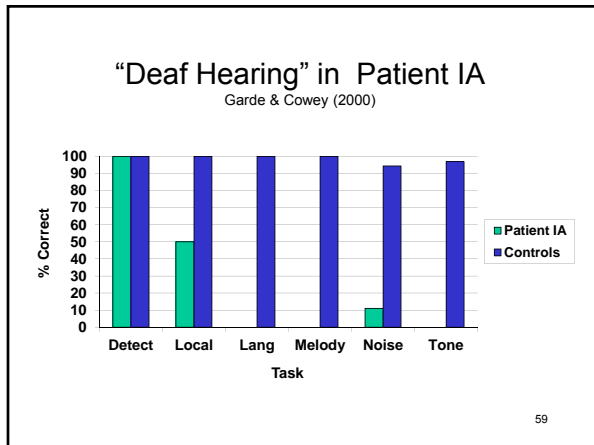
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### Prosopagnosia

Bodamer (1947)

- Inability to Recognize/Identify Familiar Faces
  - Can Describe Features
  - Recognize Other Objects
- “Fusiform Face Area”

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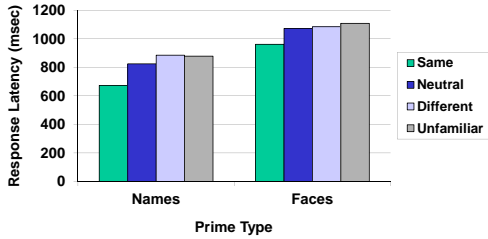
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## Face-Name Priming in Prosopagnosia

De Hann, Bauer, & Greve (1992)



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## Hemispatial Neglect

Riddoch (1935); Brain (1941)

- Ignore Space Contralateral to Lesion
  - Temporoparietal-Occipital Junction
  - Cingulate Gyrus, Thalamus
- Types
  - Body-Centered
  - Object-Centered
- Inattention
  - Disengage
  - Shift
  - Engage



Fig. 14.3. Lateral view of the right hemisphere. Lesion (as determined by CT scan) of the patient with the neglect syndrome are represented.

Heilman et al. (1970)

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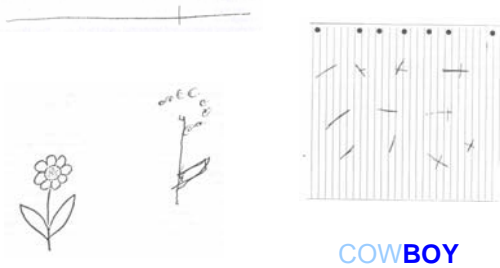
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## Clinical Tests

Heilman, Watson, & Valenstein (1993)



COWBOY

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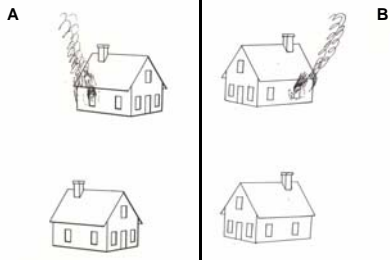
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## Implicit Perception in Neglect

Marshall & Halligan (1988)



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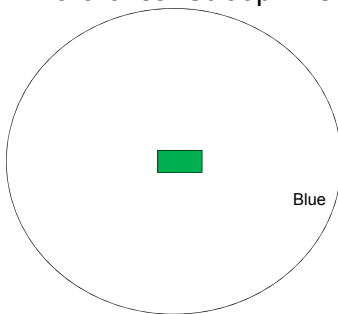
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## Priming in Preattentive Processing: Parafoveal Stroop Effects



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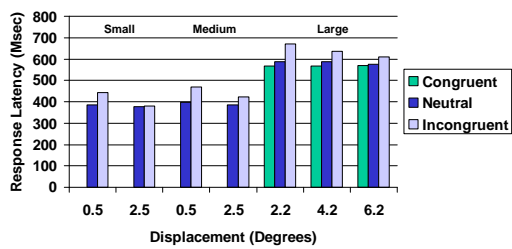
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## Parafoveal Stroop Effects

Gatti & Egeth (1978); Merikle & Gorewicz (1979)



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## Implicit Perception in Dichotic Listening

Eich (1984)

- Shadow Demanding Prose Passage
- Paired Associates on Unattended Channel
  - Taxi-FARE, War-PEACE
- Recognition Test
- Homophone Spelling Test
  - FARE vs. FAIR, PEACE vs. PIECE

67

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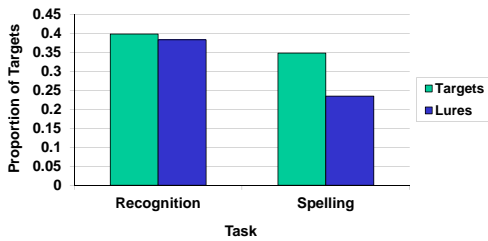
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## Priming in Homophone Spelling

Eich (1984)



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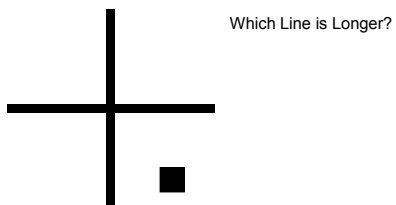
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## Inattentional Blindness

Mack & Rock (1998)



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### “Gorillas in Our Midst”

Simons & Chabris (2009), after Neisser & Becklen (1975)

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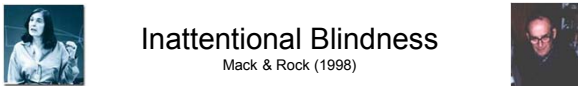
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### Inattention Blindness

Mack & Rock (1998)



- Failure to Consciously Perceive Object
  - Otherwise Salient
  - Attention, Expectation Otherwise Engaged

“Nothing is Consciously Perceived Without Attention”

- But Is There *Implicit* Perception?
  - Unconscious Perception Without Attention<sub>71</sub>

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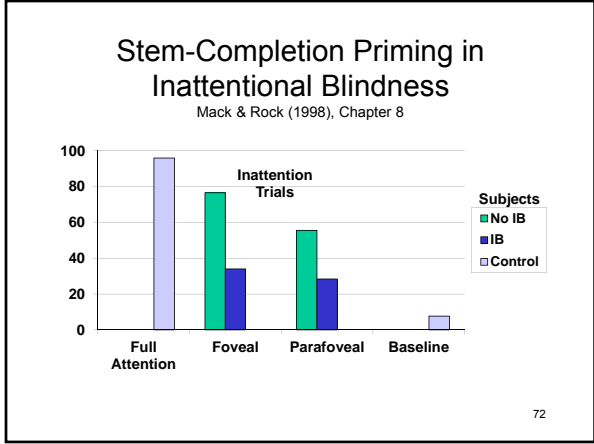
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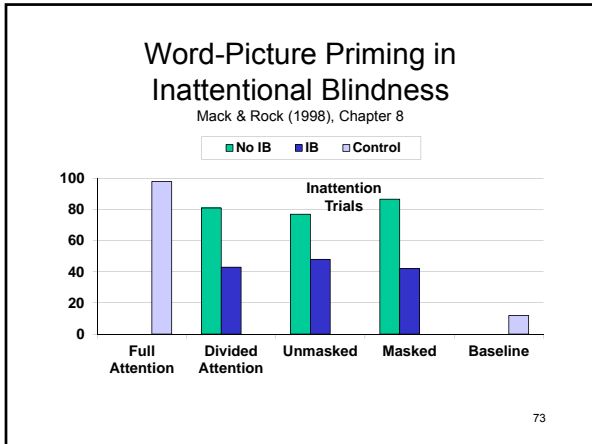
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- ### *Attentional* Blindness
- Kihlstrom (2013)
- Failure to Consciously Perceive Object
    - Otherwise Salient
    - Do Not Depend on Lack of Attention, Expectation
    - **Lack of Conscious Perception Despite Attention**
  - Forms
    - Motion-Induced Blindness
    - The Attentional Blink
    - Repetition Blindness
    - Change Blindness
  - But Again: Is There *Implicit* Perception? 74

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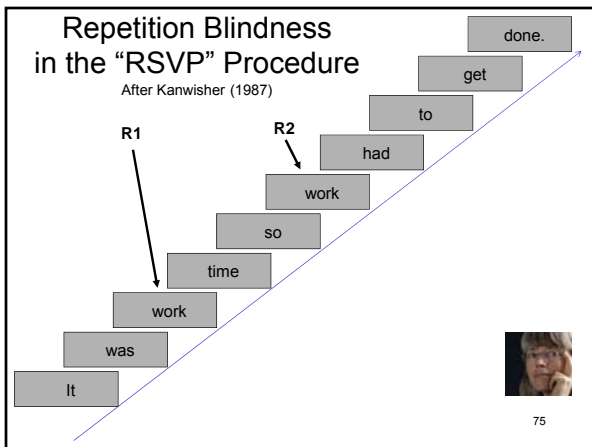
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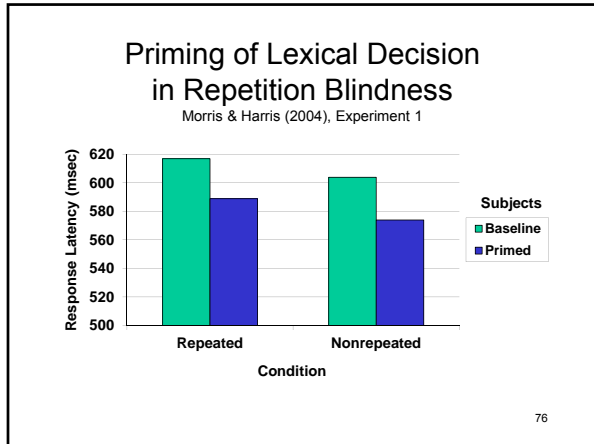
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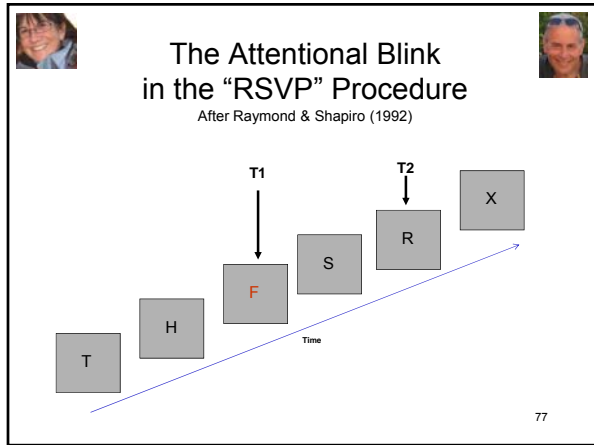
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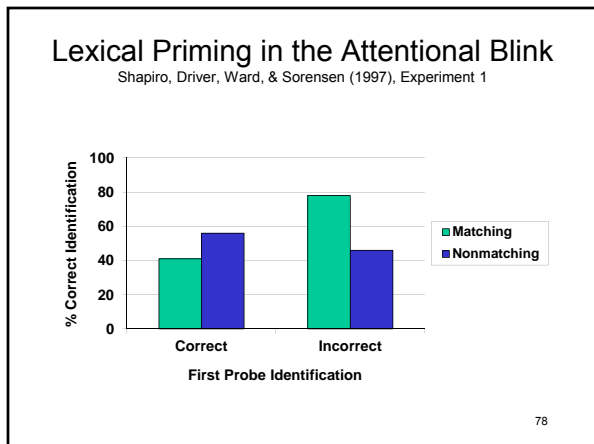
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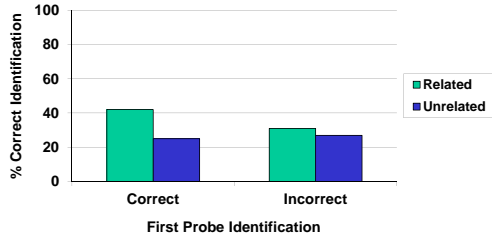
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## Semantic Priming in the Attentional Blink

Shapiro, Driver, Ward, & Sorensen (1997), Experiment 2



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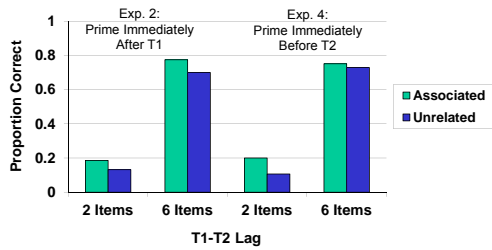
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## Semantic Priming in the Attentional Blink

Maxi, Frigen, & Paulson (1997), Experiments 2, 4, and 5



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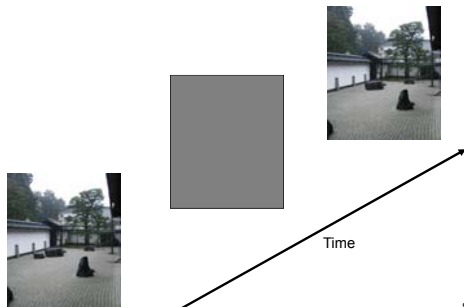
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## Change Blindness in RSVP

After Simons & Levin (1997)



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## Scope of Subliminal Perception



- Subliminal Advertising
- Subliminal Self-Help Tapes
- Silverman: *"Mommy and I Are One"*
  - Impairs Performance in Schizophrenia (etc.)
  - Improves Performance in Normals

82

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## Subliminal Affective Priming

- Connotative, Not Denotative, Meaning
  - Emotional Valence of Word, Concept
- Affectively Valenced Prime
  - *Enemy, Friend*
- Affectively Valenced Target
  - *Wins, Loses*
- Priming on Affective Judgment
  - Prime-Target Affective Congruence

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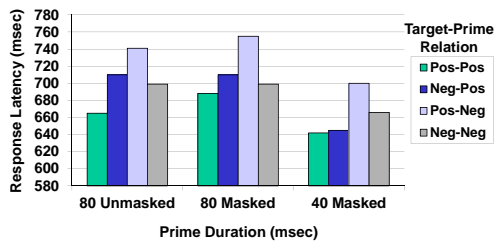
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## Subliminal Affective Priming

Greenwald et al. (1989), Experiment 3



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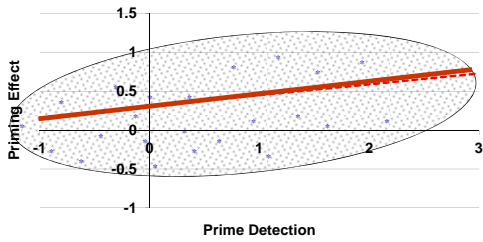
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## Predicting Priming from Detection

Greenwald, Draine, & Abrams (1996)



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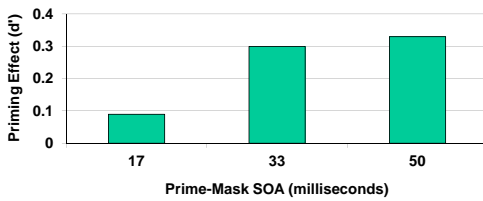
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## Subliminal Semantic Priming and Prime-Mask SOA

Greenwald et al. (1989); Draine & Greenwald (1998)

Y-Intercept where X = 0



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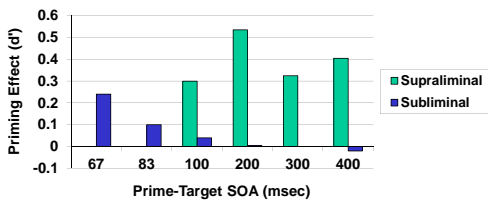
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## Subliminal Semantic Priming and Prime-Target SOA

Greenwald et al. (1989)

Prime-Mask SOA = 50 msec



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## Construction of Two-Word Primes

Greenwald & Liu (1985); Greenwald (1992)

- **Hero Wins** (Positive/Positive)
- **Enemy Wins** (Negative/Positive)
- **Hero Loses** (Positive/Negative)
- **Enemy Loses** (Negative/Negative)
  - Positive Phrase Composed of Negative Words
    - Primes Affective Judgments of Positive Targets(?)

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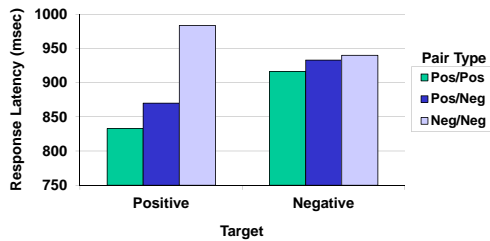
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## Masked Phrase Priming

Greenwald & Liu (1985); Greenwald (1992)



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## Limitations on “Subliminal” Perception (Masked Priming)

- Effects are Fairly Weak
- Effects are Time-Limited
  - Prime-Mask SOA Can't Be Too Short
    - Prime Duration Long Enough to Permit Processing
  - Prime-Target SOA Can't Be Too Long
    - Retention Interval Short Enough to Prevent Forgetting
- Semantic Processing Possible
  - But Analytically Limited

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### Scope of Implicit Perception

- “Subliminal” Perception
  - “True” Subliminality (Intensity, Duration)
  - Masking
- Neurological Syndromes
  - Blindsight, etc.
  - Neglect
  - Prosopagnosia
- “Preattentive” Processing
  - Parafoveal Presentation, Dichotic Listening
  - Inattentional Blindness
  - Attentional Blindness
    - Attentional Blink, Repetition Blindness, Change Blindness (?)  
91

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### What Are the Relationships Between Implicit Memory and Implicit Perception?

- Implicit Memory
  - Prime is a Stimulus in the **Past** Environment
- Implicit Perception
  - Prime is a Stimulus in the **Current** Environment
    - James’ “Specious Present”
- Is There Anything Else?
  - Implicit *Thought*
  - Implicit *Learning*

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### Implicit Thought Defined

Kihlstrom, Dorfman, Shames (1996)

- The Effect of Some Idea
  - Itself Neither a Percept Nor a Memory
  - Thought, Image, Judgment, Decision
    - Perception-Based
    - Meaning-Based
- on Experience, Thought, and Action
- in the Absence of
  - or Independent of
- Conscious Awareness of that Representation  
93

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### What Are the Relationships Between Implicit Memory, Perception, and Thought?

- Implicit Memory
  - Prime is a Stimulus in the **Past** Environment
- Implicit Perception
  - Prime is a Stimulus in the **Current** environment
    - Or the Environment of the Very Recent Past
- Implicit Thought
  - Prime is Not a Stimulus at all
    - Internally Generated Idea or Image

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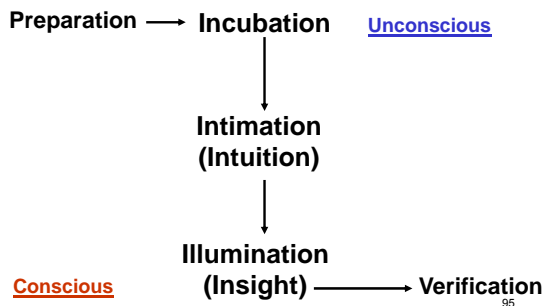
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### Unconscious Thought (?)

The "Stages of Thought", after Wallas (1926)



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### Implicit Learning Defined

After Reber (1967)

- The Acquisition of New Knowledge
  - Semantic or Procedural
- by Virtue of Experience
- in the Absence of
  - or Independent of
- Conscious Awareness of that Knowledge.

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## Evidence for Implicit Learning

- Artificial Grammar Learning
- Learning of Complex Systems
- Sequence Learning
- Category Learning
- Classical and Instrumental Conditioning

But Problem of Matching  
Explicit and Implicit Tests

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## What Are the Relationships Between Implicit Memory and Implicit Learning?

- Implicit Memory
  - Unconscious Influence of Episodic Memory
  - Source Amnesia (The Claparede Story)
    - Consciously Aware of New Learning
    - No Awareness of Learning Experience
- Implicit Learning
  - Unconscious Influence of Semantic or Procedural Knowledge
    - Aware of Learning Experience
    - No Awareness of New Knowledge

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## The Cognitive Unconscious

Rozin (1976); Kihlstrom (1987)

- Automaticity of Thought Processes
- Unconscious Cognitive States
  - Implicit Memory
  - Implicit Perception
  - Implicit Thought
  - Implicit Learning
- What about Unconscious Mental Life  
*Beyond Cognition?*

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## A Short List of Mental Functions

Immanuel Kant (1724-1804)

“There are three  
absolutely irreducible  
faculties of mind:  
knowledge, feeling, and desire.”  
*Critique of Judgment* (1790)



R.H. Wozniak

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## The Trilogy of Mind

Hilgard (1980)

- Cognition
  - Knowledge and Beliefs
- Emotion
  - Affect, Moods, Feelings
- Motivation
  - Drives, Needs, Desires, Goals, Purposes



E.R. Hilgard

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## Emotion, Motivation, and Automaticity

- Emotional and Motivational States Can Be Elicited Automatically by Effective Stimuli
  - Unconscious Activation
    - Bargh's "Auto-Motive" Model
    - Subliminal Affective Priming
- But the States Themselves are Conscious

Can Emotional and Motivational States  
Themselves Be Unconscious?

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## Explicit and Implicit Motivation

After McClelland, Koestner, & Weinberger (1989)



- Explicit Motivation
  - Conscious Drive, Need, or Goal
    - *n*Achievement, *n*Power, *n*Affiliation/Intimacy
- Implicit Motivation
  - Any Effect of a **Motive, Drive or Goal** on Experience, Thought, or Action
  - Absence of Conscious Awareness of Motive
    - Or, independent of Conscious Motive

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## Assessing Explicit and Implicit Motivation

After Jackson (1965); McClelland, Koestner, & Wenberger (1989)

- Personality Research Form
  - Questionnaire Measure
    - "I enjoy doing things which challenge me"
    - "I will keep working on a problem after others have given up"
    - "I often set goals that are very difficult to reach"
- Thematic Apperception Test
  - "Picture-Story Exercise"
    - Outperforming Someone Else
    - Meeting or Surpassing a Self-Imposed Standard of Excellence
    - Unique Accomplishment
    - Involvement in Advancing One's Career



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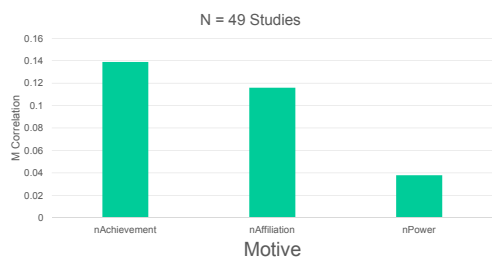
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## Explicit vs. Implicit Motives

Kollner & Schultheis (2014)



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## Critique of Implicit Motives

- Lack of Correlation  $\neq$  Dissociation
  - *Prima Facie* Evidence
- Might be Method Variance
  - Self-Report
  - Judges' Ratings
  - Behavioral Observation
- Might Reflect Two Different Constructs

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## The Emotional Unconscious

Kihlstrom, Mulvaney, Tobias, & Tobis (2000)

- Automaticity of *Emotional* Response
  - Zajonc, Immediate Emotional Response
  - Ekman, Innate Facial Expressions of Emotion
- Emotional Response as an Expression of...
  - Implicit Memory
  - Implicit Perception
- Implicit Emotion *per se*
  - Dissociable from *explicit* emotion?

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## Multiple-Systems Theory of Emotion

Lang (1968); Rachman & Hodgson (1974)



- Three Components to Emotional Response
  - Cognitive (Subjective Experience)
  - Physiological (Covert Somatic Response)
  - Behavioral (Overt Behavioral Response)
- Imperfect Coupling Between Systems
  - Leads to *Desynchrony*

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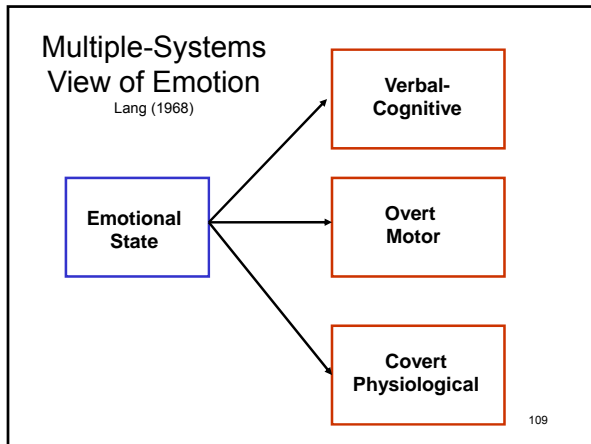
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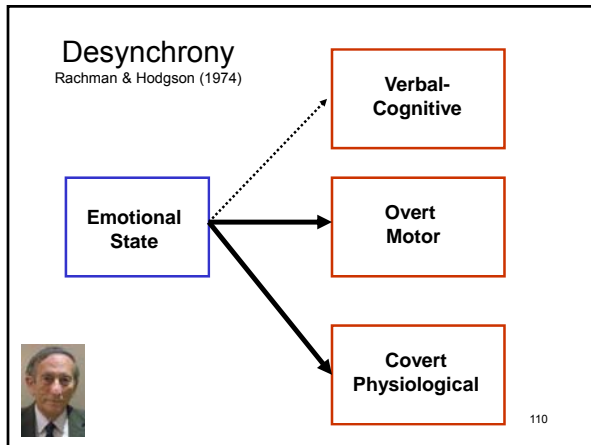
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- ### Explicit and Implicit Emotion
- After Kihlstrom, Mulvaney, Tobias, & Tobis (1996)
- Explicit Emotion
    - Subjective Mood, Affect, or Feeling
  - Implicit Emotion
    - Any Effect of an **Emotion** on Experience, Thought, or Action
      - Overt Motor Response
        - Facial Expressions
      - Covert Physiological Response
        - Autonomic Nervous System
    - In the Absence of Conscious Feeling State
      - Or Independent of Conscious Feeling State
- 111

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## Dissociations Between Explicit and Implicit Attitudes

Greenwald & Banaji (1995) Banaji & Greenwald (2013)



- Explicit Attitude
  - Affective Disposition to Favor/Oppose
    - Pro/Anti, Like/Dislike, Positive/Negative
  - Assessed by Self-Report Scales
- Implicit Attitudes
  - Effect on Experience, Thought, or Action
    - Physiology or Behavior
  - Attributable to Attitude
  - Independent of Awareness of that Attitude

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## Implicit Attitude Test

Greenwald et al. (1998); Banaji & Greenwald (2013)

- Make Dichotomous Judgment
  - Phase 1: Is *X* a Swedish or Finnish name?
    - Aaltonen, Eriksson, Haapakoski, Lind, Nurminen, Sundqvist
  - Phase 2: Is *Y* a Good or a Bad Thing?
    - Admiration, Aggression, Caress, Abuse, Freedom, Crash
- Then Superimpose Tasks
  - Swedish-Finnish Alternates with Good-Bad
    - Phase 3: Swedish Shares Key with Good
      - Finnish Shares Key with Bad
    - (Phase 4 is a Control Condition)
    - Phase 5: "Swedish" Shares Key with "Bad"

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## Pattern of Responses Reveals Implicit Associations

Greenwald et al. (1998)

### Stimulus-Response Compatibility

Fitts & Seeger (1953), after Small (1951)

Faster Responses when Compatible with Stimulus  
"Left" with Left key, "Right" with Right

- Implication of S-R Compatibility
  - Same Response to Swedish Names, Positive Words
    - Faster Latencies: Association **Swedish ↔ Good**
  - Same Response to Finnish Names, Negative Words
    - Faster Latencies: Association **Finnish ↔ Bad**

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### The "Race IAT" Paper & Pencil Version

Project Implicit (2007)

**A**

For egalitarian people and for African American people's basic need in the world is the same. For prejudiced people, white people's basic need in the world is the same as the need for African American people's basic need in the world. For egalitarian people, the need for African American people's basic need in the world is the same as the need for white people's basic need in the world. For prejudiced people, the need for African American people's basic need in the world is the same as the need for white people's basic need in the world.

disaster	agony
hate	envy
honest	innocent
grief	crash
lucky	diamond
peace	sweet
rotten	tragedy

**B**

For egalitarian people, white people's basic need in the world is the same as the need for African American people's basic need in the world. For prejudiced people, the need for African American people's basic need in the world is the same as the need for white people's basic need in the world. For egalitarian people, the need for African American people's basic need in the world is the same as the need for white people's basic need in the world. For prejudiced people, the need for African American people's basic need in the world is the same as the need for white people's basic need in the world.

disaster	agony
hate	envy
honest	innocent
grief	crash
lucky	diamond
peace	sweet
rotten	tragedy

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### Implicit Stereotyping in White Subjects

Greenwald et al. (1998)

Correlation with Explicit Prejudice:  $.07 < r < .30$

Condition	Black/White	Pos/Neg	White/Pos	Black/Pos
White/Pos First	~700	~700	~800	~900
Black/Pos First	~700	~700	~800	~900

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### Implicit Stereotyping in Japanese and Korean Subjects

Greenwald et al. (1998)

Correlation with Explicit Prejudice:  $-.04 < r < .64$

Subjects	Jap/Kor	Pos/Neg	Kor/Pos	Jap/Pos
Koreans	~500	~500	~500	~600
Japanese	~600	~500	~600	~500

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## The "Blindspot"

Banaji & Greenwald (2013)



"Hidden biases we all carry from a lifetime of exposure to cultural attitudes"

Age, gender, race, ethnicity, religion, social class, sexuality, disability status, nationality

"Perceptions of social groups – without our awareness or conscious control – shape our likes and dislikes and our judgments about people's character, abilities, and potential"

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## Problems with the IAT

Arkes & Tetlock (2004); Levitin (2013)



### • Confounding Factors

- Target Familiarity
- Task Difficulty
- Complementarity Assumption
  - Negative vs. "Less Favorable"
  - Positive vs. "More Favorable"
- Associations vs. Attitudes

### • Construct Validity

- Predict External Criterion
- Relevant Group Differences
  - "Would Jesse Jackson Fail the IAT?"



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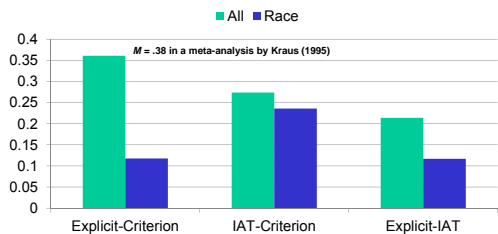
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## External Validity of the IAT

Greenwald et al. (2009)

122 Reports, 184 Samples, 14,900 Subjects



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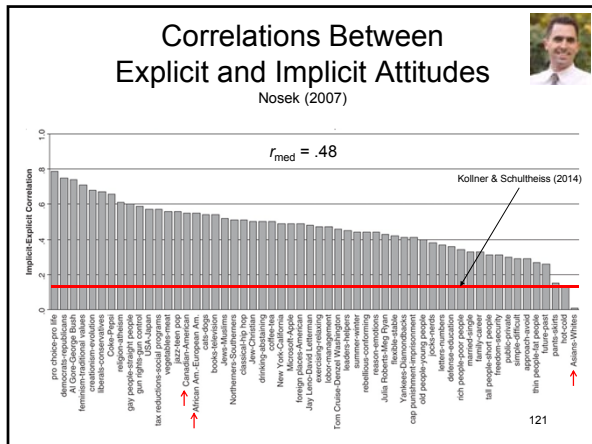
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- ### Problems with IAT
- Dissociation from Explicit Measure?
    - Significant Correlations Show Validity
    - Nonsignificant Correlations Show Dissociation
    - Correlations Usually Significant
      - Increase with Importance
      - Decrease with “Social Sensitivity”
  - The Psychologist’s Fallacy (James, 1890)
    - Every Event has a Psychological Explanation
    - Psychologist’s Explanation is the Right One
- 122

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- ### QUAD Model of Automatic Bias in Stereotyping and Prejudice
- Sherman et al. (2008)
- 
- Dual-Process Theory of Stereotyping
    - Stereotypes/Prejudice Are Automatically Evoked
    - Both Subject to Conscious Self-Regulation
  - Models 4 Parameters, Not Just 2
    - Automatic Association Activation (AC) of Bias
    - Discriminability of Correct Response (D)
    - Overcoming Bias (OB) to Select D
    - Guessing (G) When D and AC Fail
- 123

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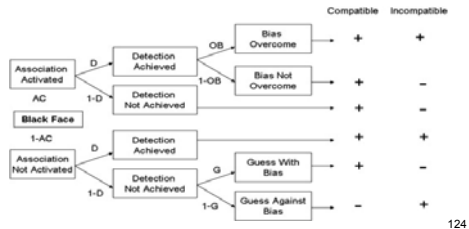
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## The Quad Model Applied to the Black-White IAT

Beer et al. (2008), after Sherman et al. (2008)

Black vs. White Face  
Positive vs. Negative Word



124

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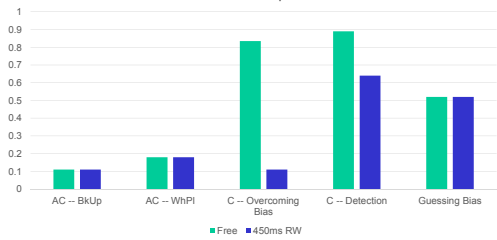
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## Parameter Estimates: Black-White IAT

Conrey et al. (2005)

With and Without Response Window



125

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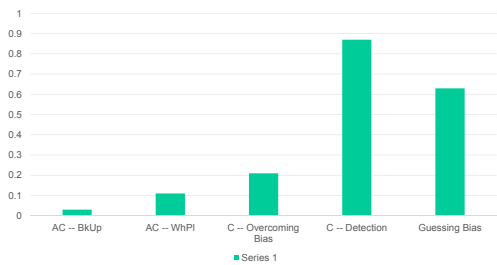
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## Parameter Estimates: Black-White IAT

Beer et al. (2008)



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## Extending the Explicit-Implicit Distinction

When Searching for Explicit-Implicit  
Dissociations...

...the More Your Study Looks Like  
a Study of Implicit Memory  
the More Convincing that Study Will Be.

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## Balancing the Ledger

- |                        |                           |
|------------------------|---------------------------|
| <b>Strong Evidence</b> | <b>Weaker Evidence</b>    |
| • Implicit Memory      | • Implicit Learning       |
| • Implicit Perception  | • Implicit Thought        |
|                        | <b>Ambiguous Evidence</b> |
|                        | • Implicit Motives        |
|                        | • Implicit Emotions       |

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## The Contradiction of the Unconscious

*Kant, Anthropology from a Pragmatic Point of View (1798)*

**To have ideas, and yet not be  
conscious of them, --**

there seems to be a contradiction in  
that; for how can we know that we  
have them, if we are not  
conscious of them?



Nevertheless, we may become  
aware indirectly that we have an  
idea, although we be not directly  
cognizant of the same.

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## A Tumbling-Ground for Whimsies?

James, *Principles of Psychology* (1890), p. 163



The distinction... *between the unconscious and the conscious being of the mental state...* is the sovereign means for believing what one likes in psychology, and of turning what might become a science into a tumbling-ground for whimsies.

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