

PSYC 2530: Attention

and the Stroop effect

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Last compiled 04/23/22

Reminders from last class

There are no textbook chapter readings for this learning module.

Roadmap

1 Attentional Concepts and Phenomena

2 Stroop Effect

3 Class Experiment

What is Attention?

Everybody knows what attention is... - William James

What is Attention?

- How we prioritize our mental resources
- How we select relevant from irrelevant information
- How we focus
- How we ignore

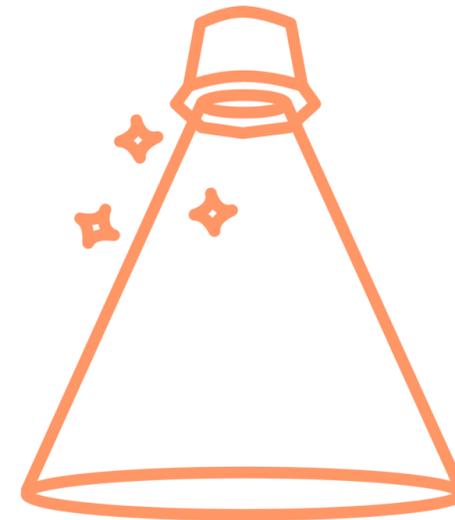
Metaphors of attention

There are different perspectives on the kinds of processes that are involved in attention abilities

Theories of attention use a variety of metaphors

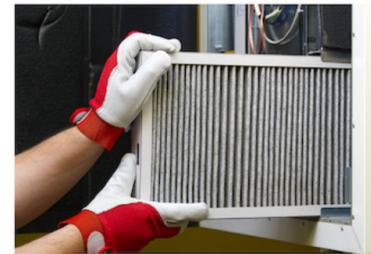
Spotlight Metaphor

- Attention acts like a spotlight
- Attention shines “extra” cognitive resources on selected information
- Attention highlights attended information



Filter Metaphor

- Attention acts like a filter
- Attention prevents unwanted information from further cognitive processing



Attentional Distinctions

Endogenous Attention

- Internal “orienting” of attention
- Voluntary decision to attend to some information and not others

Exogenous Attention

- External “orienting” of attention
- Some stimuli automatically cause people to attend to them (e.g., loud noises)

Controlled vs automatic influences

Controlled

- Effortful
- Voluntary
- Deliberate
- usually resource limited
- slow

Automatic

- Effortless
- fast, rapid, ballistic
- Involuntary

Attentional Theory

There are multiple theoretical frameworks for understanding attention

- (see additional reading on blackboard for a review)
- Strayer, D. A., & Drews, F. A. (2007). Attention. In F. T. Durso (Ed.), *Handbook of Applied Cognition* (2nd Edition, p. 26). John Wiley & Sons, Ltd.

Attention to Action

Norman and Shallice's **Attention to Action** theory

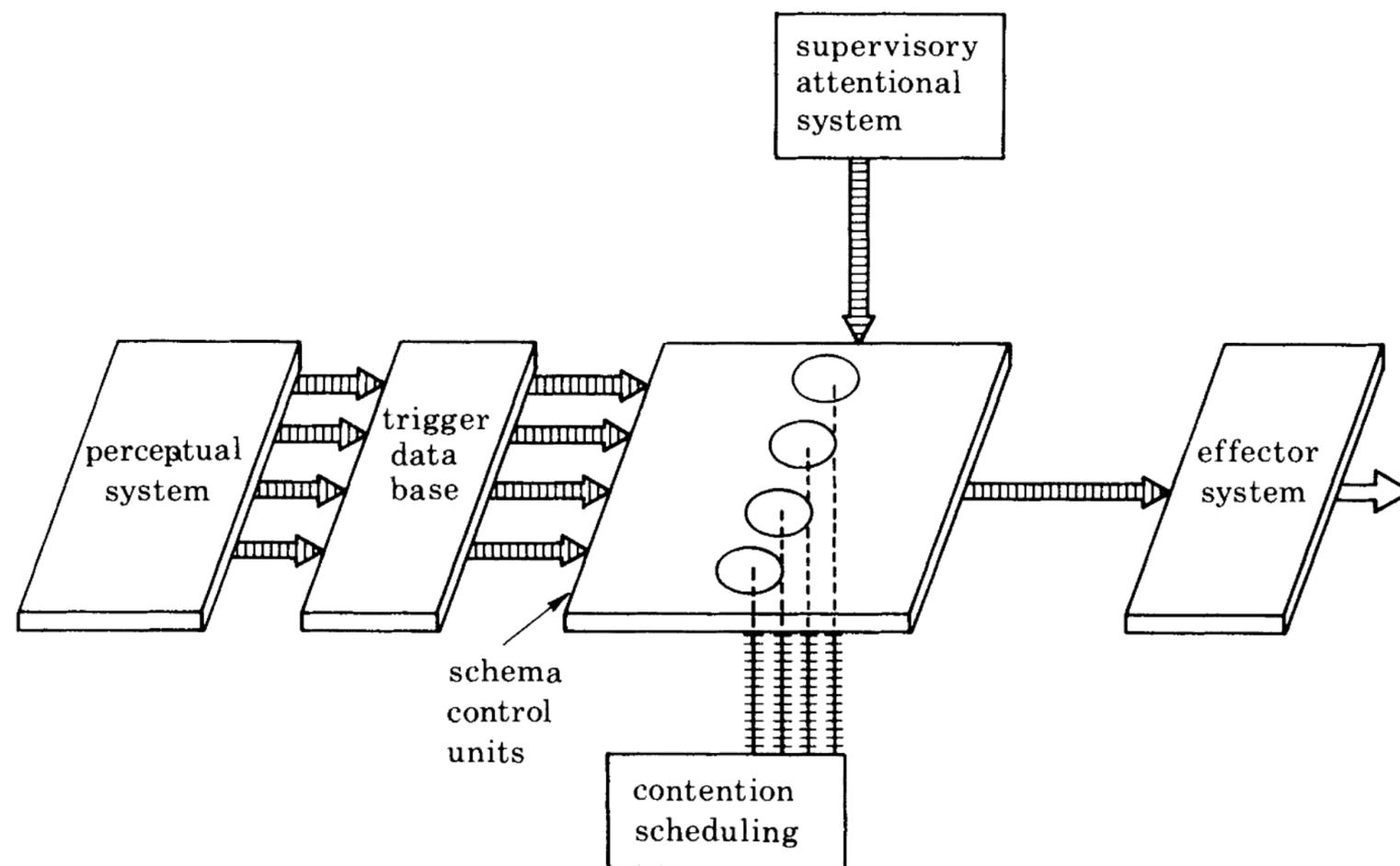


Figure from Shallice, T. (1982). Specific Impairments of Planning. Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 298, 199-209.

S-R learning and Supervisory Attention



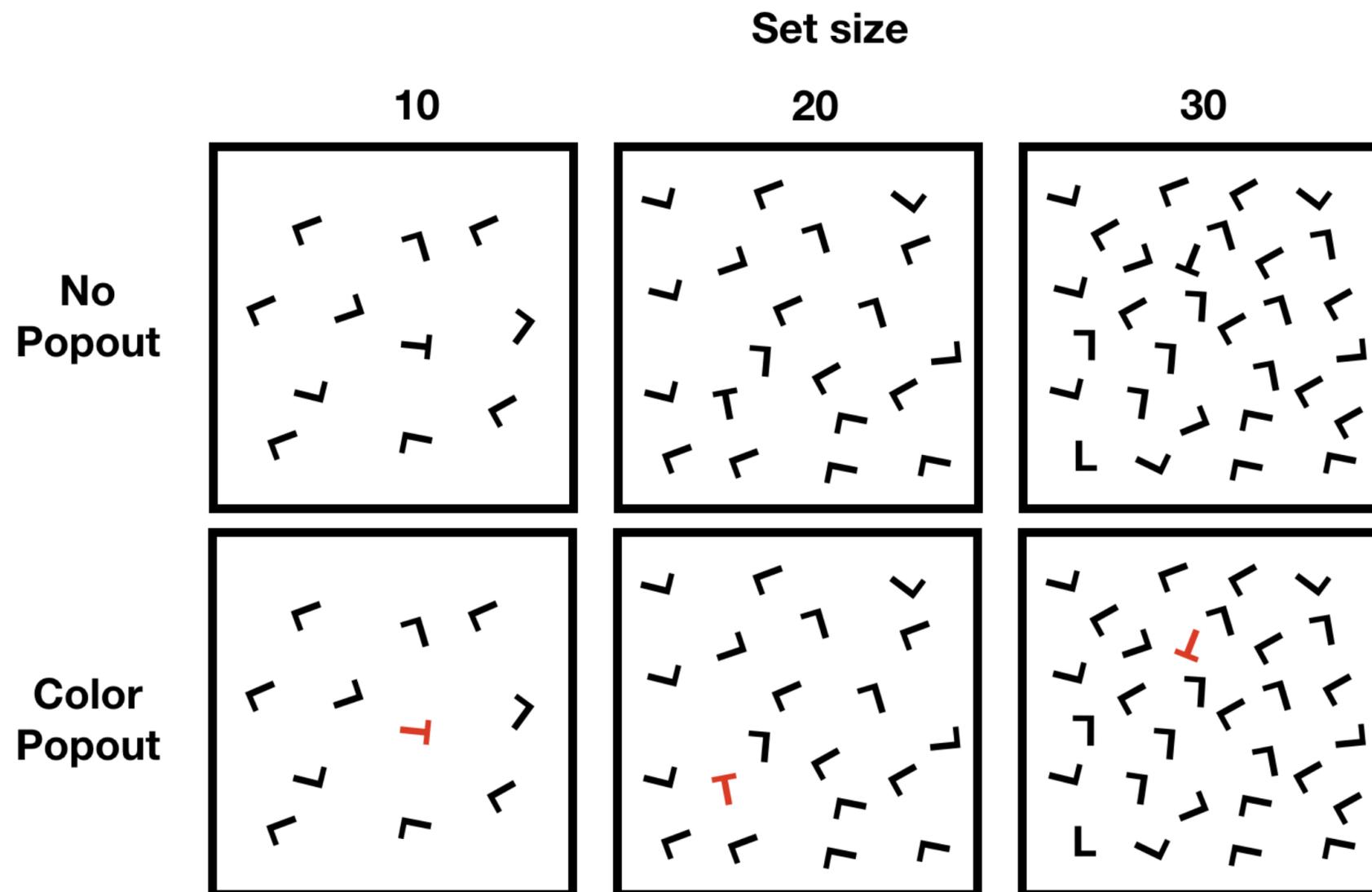
Attention tasks and phenomena

- Researchers devise laboratory tasks that require attentional processing
- Measures of task performance are used to demonstrate phenomena of attention, and to test theories of attention

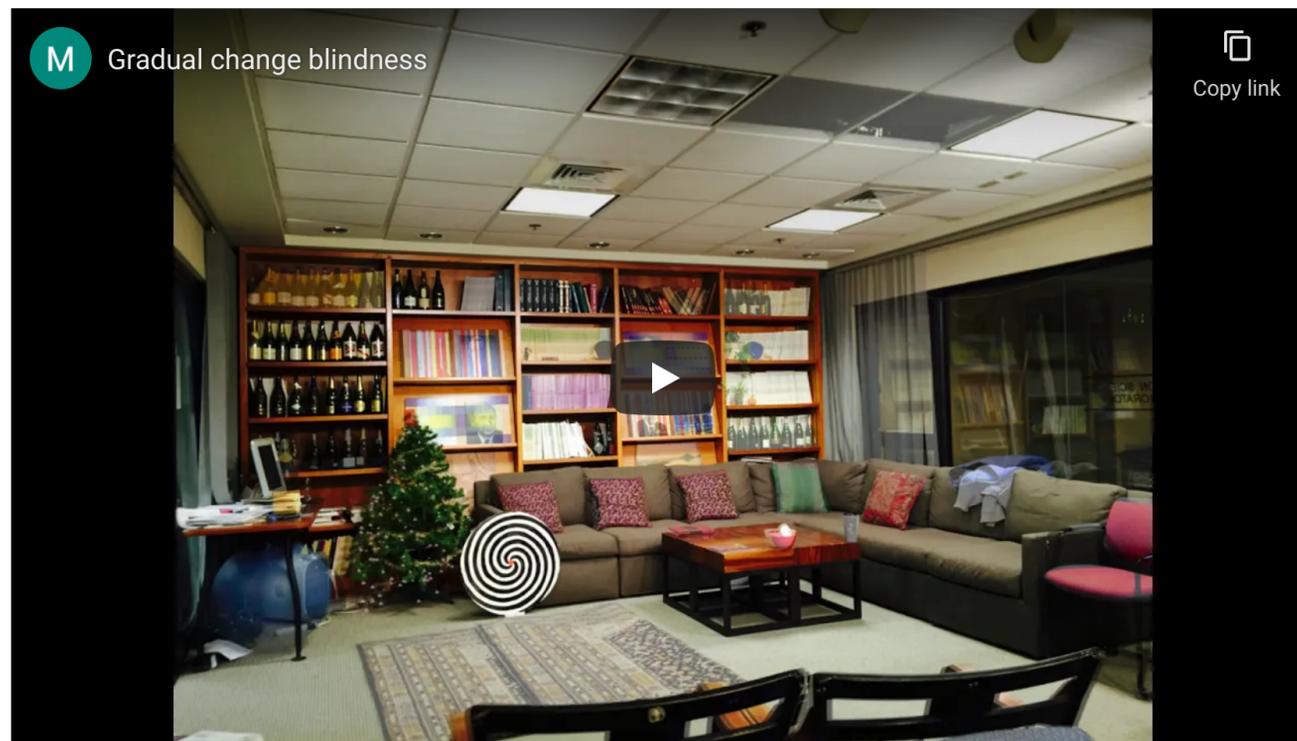
Some Attentional phenomena

- Cocktail party effect
- Utilization Behavior
- Change Blindness

Visual Search and pop-out



Change Blindness

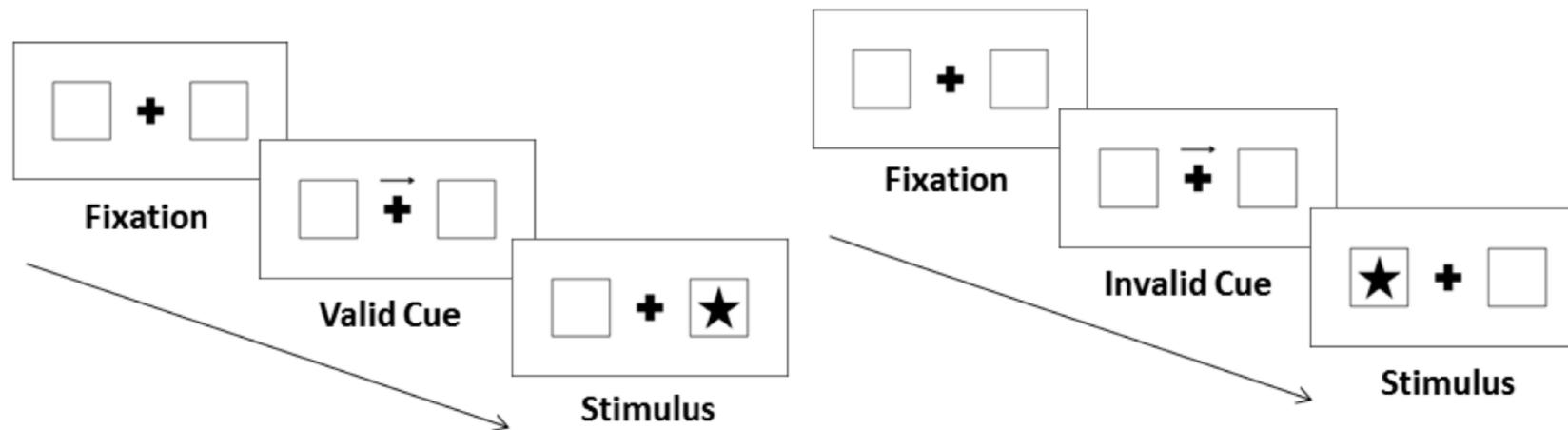


Attentional Cuing

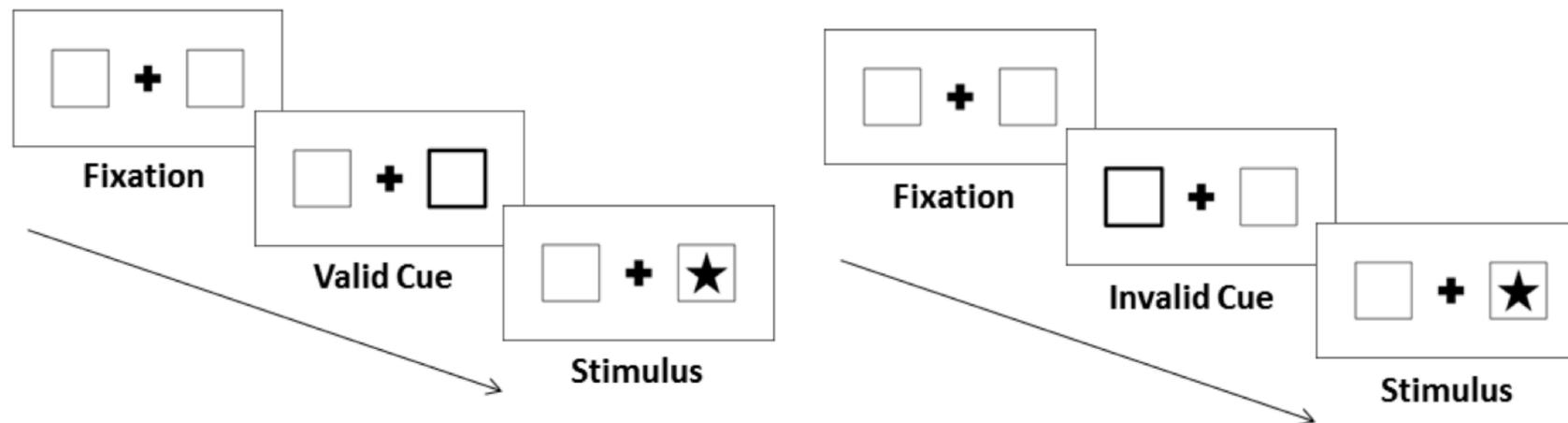
- What are the consequences of attending to something?
- How can we measure what attention does to information processing?

Posner Cuing task

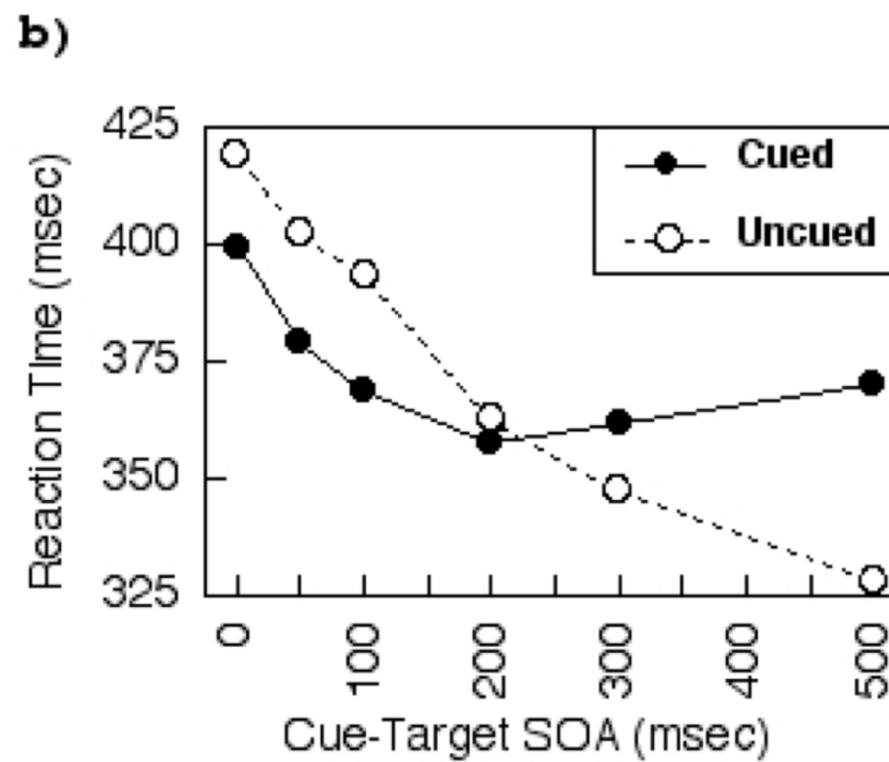
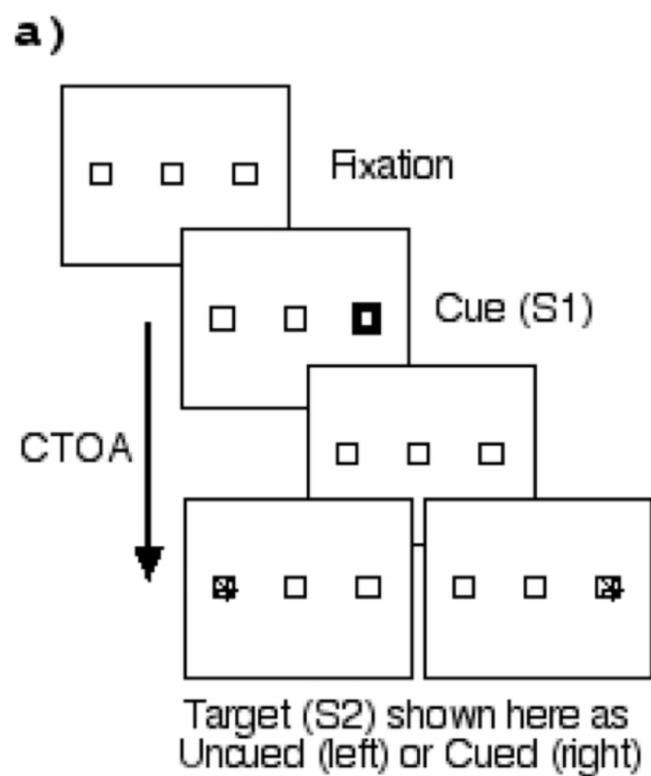
Endogenous Cues



Exogenous Cues



Inhibition of Return



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Selective Attention

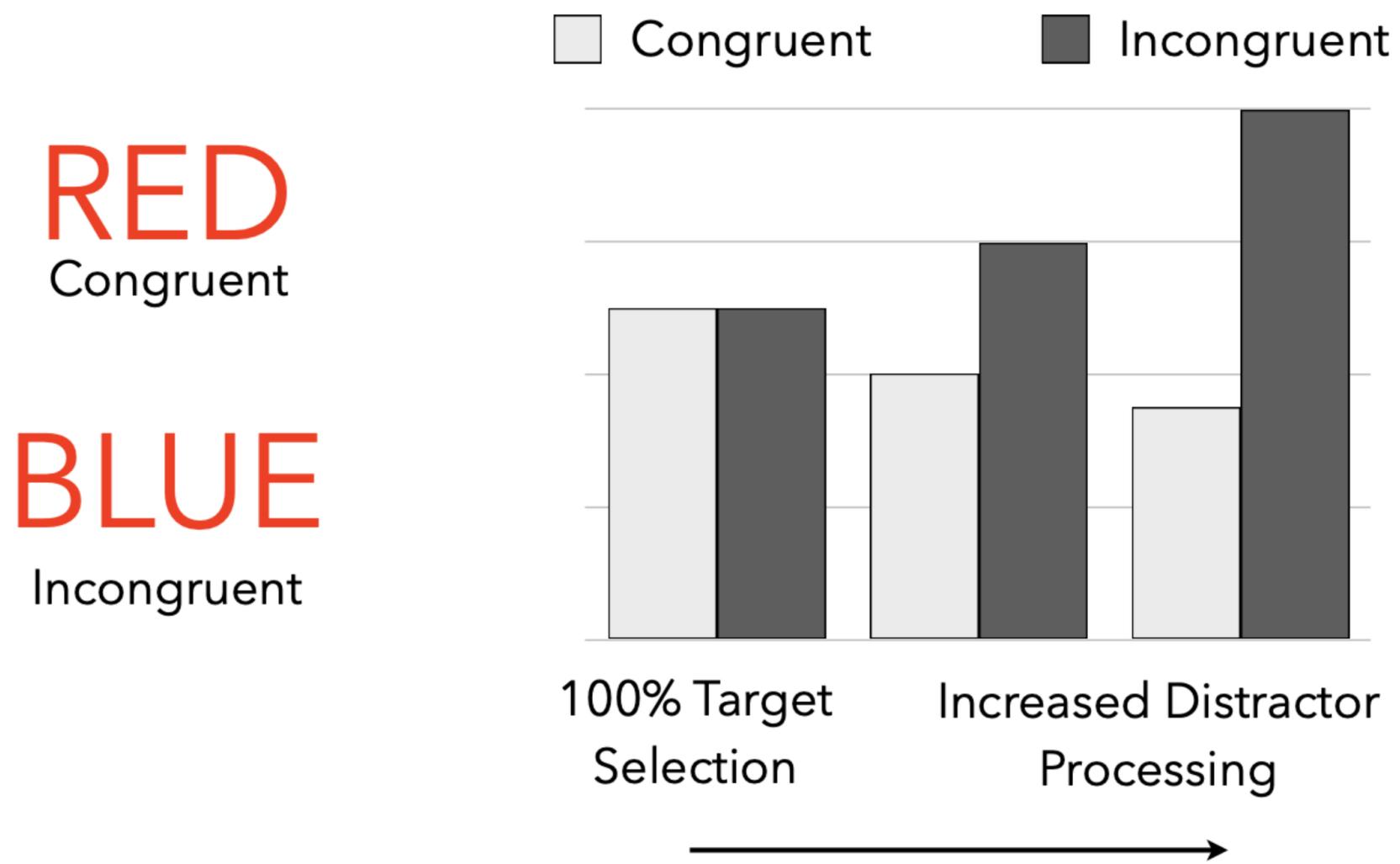
- The ability to “selectively” focus or process task-relevant information
- and ignore or avoid processing task-irrelevant information
- Selective attention abilities are commonly studied in congruency tasks, like the Stroop Task

Stroop Effect

red
blue
green
yellow
blue
red
green
red
blue

red
blue
green
yellow
blue
red
green
yellow
blue

Measuring Selective Attention



List-wide proportion congruent

75% Congruent
High PC

Strategy:
Increase
Word-
Reading
(usually
helps)

red
blue
green
yellow
blue
red
green
red
blue

25% Congruent
Low PC

Strategy:
Decrease
Word-
Reading
(usually
hurts)

red
blue
green
yellow
blue
red
green
red
blue

List-wide proportion congruent results

Numerous Demonstrations

Shor (1975)

Logan & Zbrodoff (1979)

Lowe & Mitterer (1982)

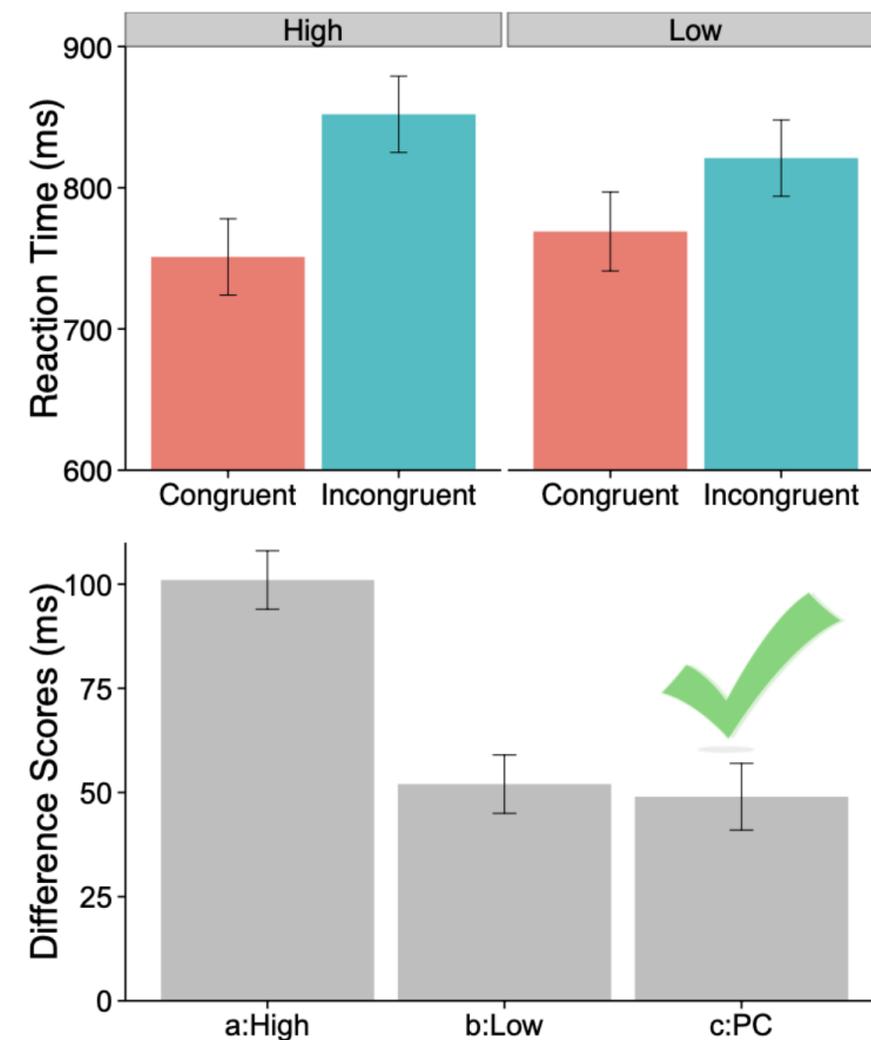
Logan et al. (1984)

Cheesman & Merikle (1986)

Lindsay & Jacoby (1994)

West & Baylis (1998)

Kane & Engle (2003)



Explanation

- What processes are responsible for the list-wide proportion congruent effect?
- Strategic Account
- Learning Account

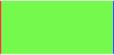
Strategic Account

Participants can predict congruency of upcoming trial

- 75% congruent -> Prepare in advance of trial to attend to word dimension (because it is easy and fast)
- 25% congruent -> Prepare in advance of trial to ignore word dimension

Learning Account

- Some Stroop items are presented more than others
- RTs are faster for more frequent (more practice) than less frequent items

					
High 75% Congruent	red	9	1	1	1
	green	1	9	1	1
	blue	1	1	9	1
	yellow	1	1	1	9
Low 25% Congruent	red	3	3	3	3
	green	3	3	3	3
	blue	3	3	3	3
	yellow	3	3	3	3

Processing accounts

- Voluntary Strategies
- Simple stimulus-response learning

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Testing Voluntary Control

Let's conduct an in-class experiment on the Stroop experiment

Question

Can people voluntarily control how they attend to word-information?

Logic

- If people can choose to ignore word information then the Stroop effect should get smaller
- If people can increase their focus on word information then the Stroop effect should get larger

Instructional Manipulation

IGNORE WORD Instructions

- Tell people to **ignore** word information while they do a Stroop task

FOCUS on WORDS

Instructions

- Tell people to **focus** on word information while they do a Stroop task

Predictions

- What do we predict will happen?
- What would our results look like in a graph?

Try it out

Head to the first assignment in this learning module to try out the experiment for yourself.

What's next

Take the quiz and complete any additional assignments

Next week is the second last module of the term, on language