

In Search of Sparing:

Spatial Cueing can be Triggered Contingently by Visual Form

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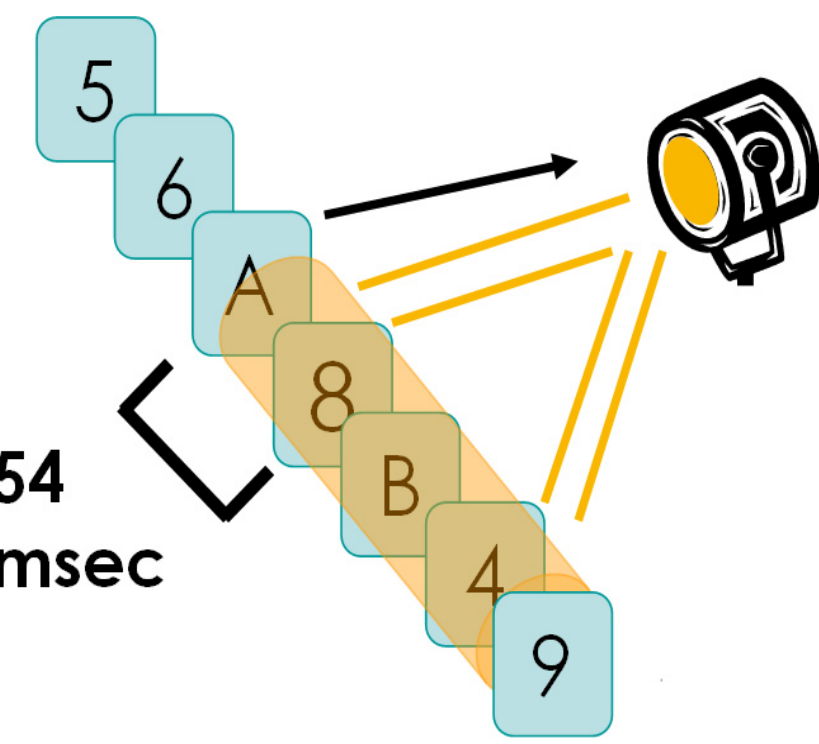
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Transient attention as a temporal spotlight

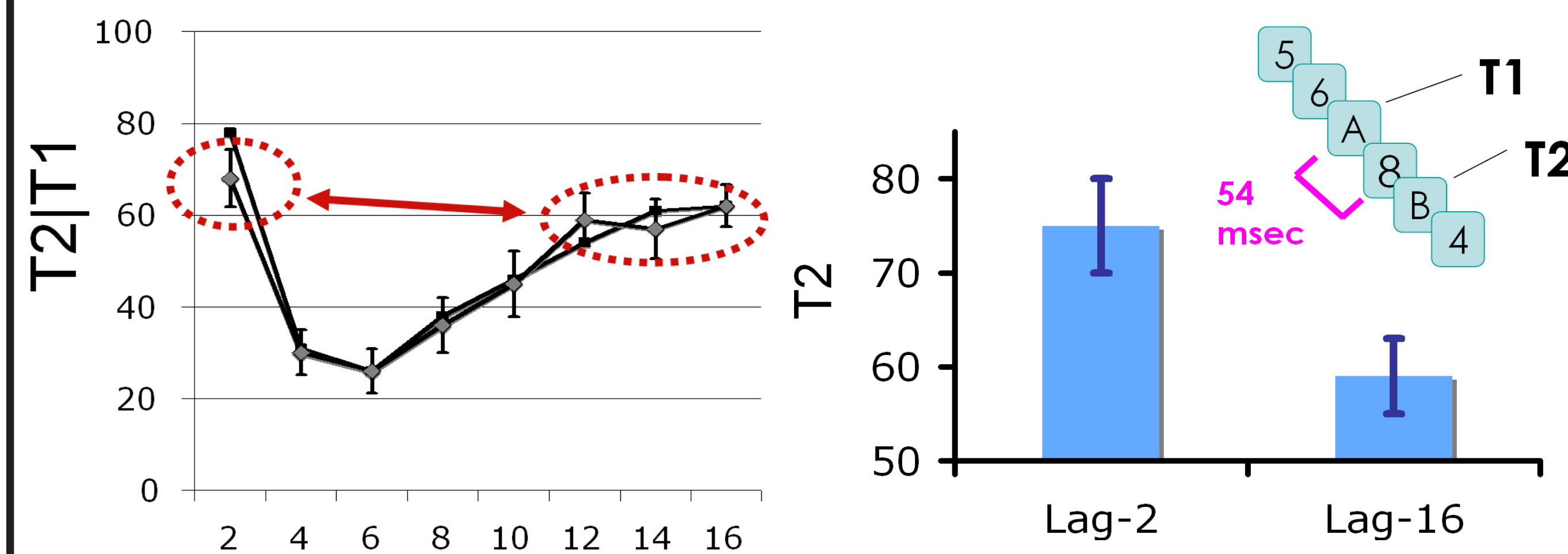
Transient attention (Nakayama & Mackeben 1989; Muller & Rabbitt 1989) is a rapid and reflexive form of spatial attention

TA may act as a mechanism of temporal selection

In RSVP, a T2 may benefit from the transient attention deployed by T1



Sparing or Enhancement?



T2 during sparing (Lag-2, 108 ms SOA) is enhanced relative to T2 outside of the blink (Lag-16, 864 ms SOA).

The Simultaneous Type/Serial Token model explains this enhancement as the result of transient attention deployed in response to T1

Bowman, H. & Wyble, B (In Press) The Simultaneous Type, Serial Token Model of Temporal Attention and Working Memory, *Psychological Review*

The Question:

Can attention be captured by objects based on their categorical identity?

Methods Experiment 1

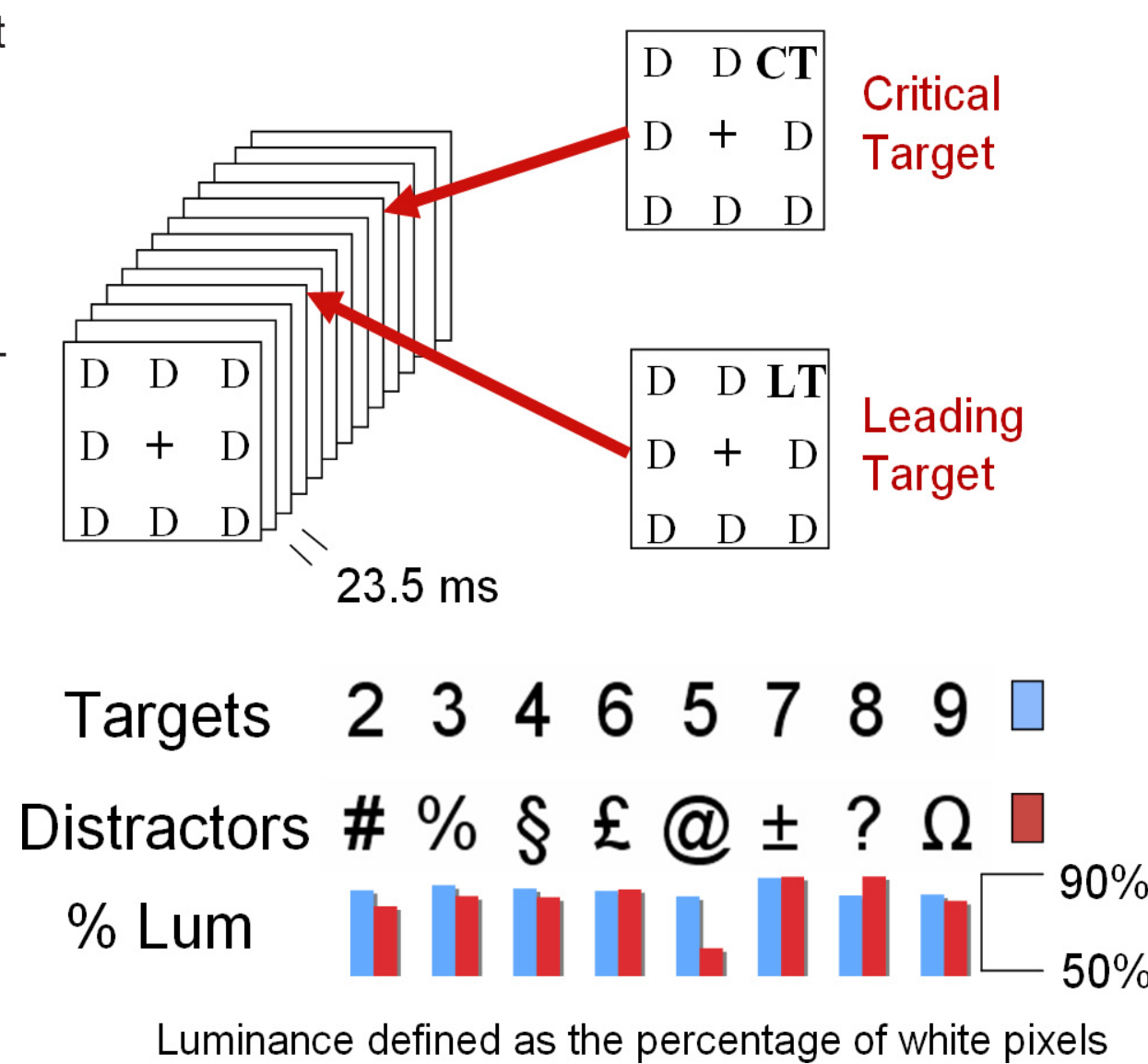
Subjects viewed a changing array of items with instruction to report any digits at trial's end.

One random distractor changed every 23.5 ms. Each panel in the display to the right indicates a change in the display.

Two target items were placed into the stream in three different relative configurations:

Same location, 107ms SOA
Different location 107 ms SOA
Same location 247 ms SOA

Leading targets had a duration of 82 ms
Critical targets had a duration of 118 ms



The Leading Target captures attention

CT report is enhanced by LT (72% vs 51%)

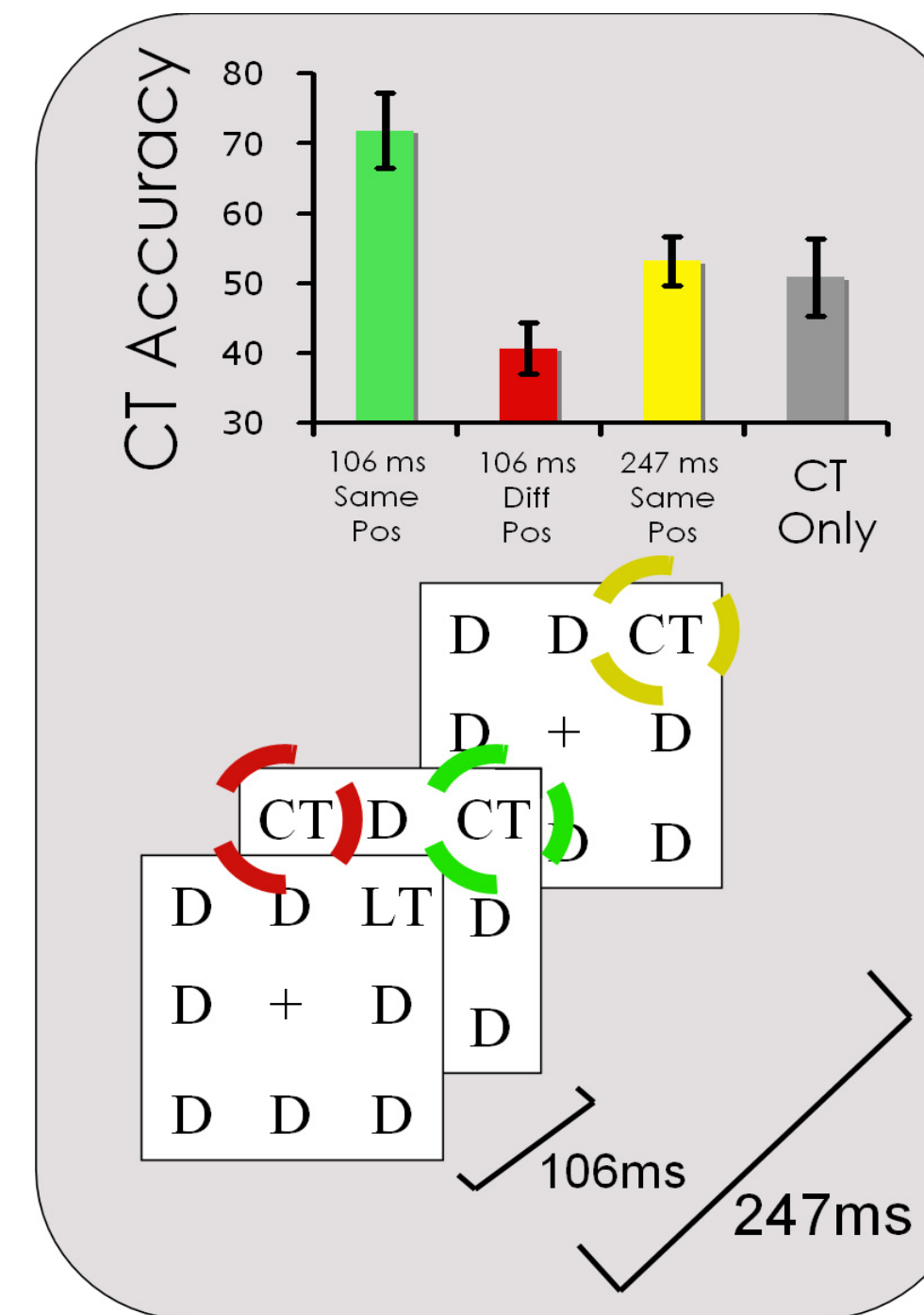
Onset is rapid (100ms)

Duration is brief (diminished by 250ms)

	106ms Same Pos	106 ms Diff Pos	247ms Same Pos	CT Only
LT	9 (2)	29 (4)	18 (3)	
CT	72 (6)	39 (4)	53 (4)	51(6)
CT LT	78 (6)	53 (4)	63 (3)	
CT LT	20 (11)	4 (2)	13 (5)	

LT: Leading Target Accuracy
CT: Critical Target Accuracy
CT|LT: Critical Target Conditional on missed LT
CT|LT: Critical Target Conditional on LT

(n) = SE

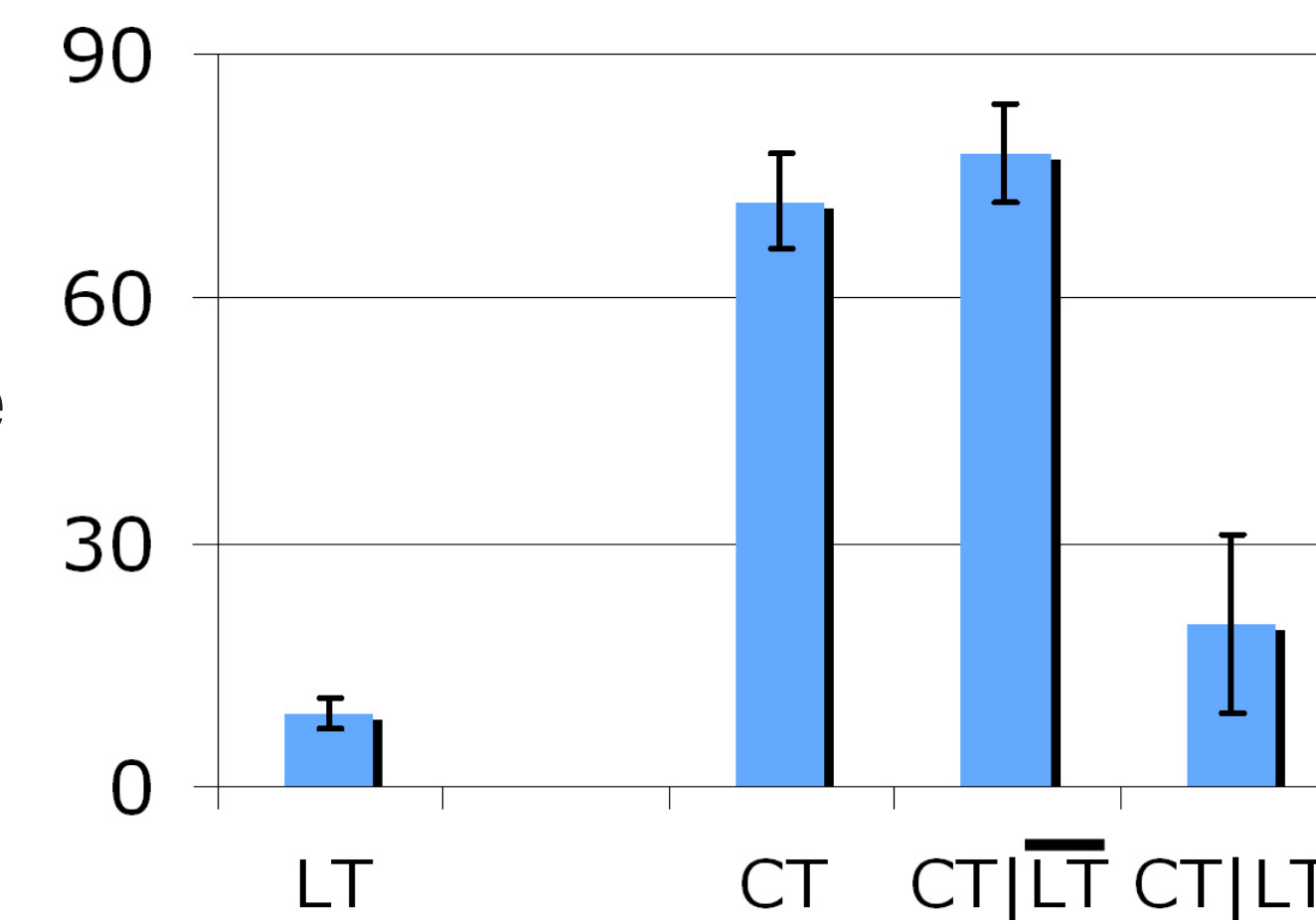


A Target Can Capture Attention Without being Seen

Leading Targets were reported if they were seen

However, critical targets are better perceived when leading targets were missed

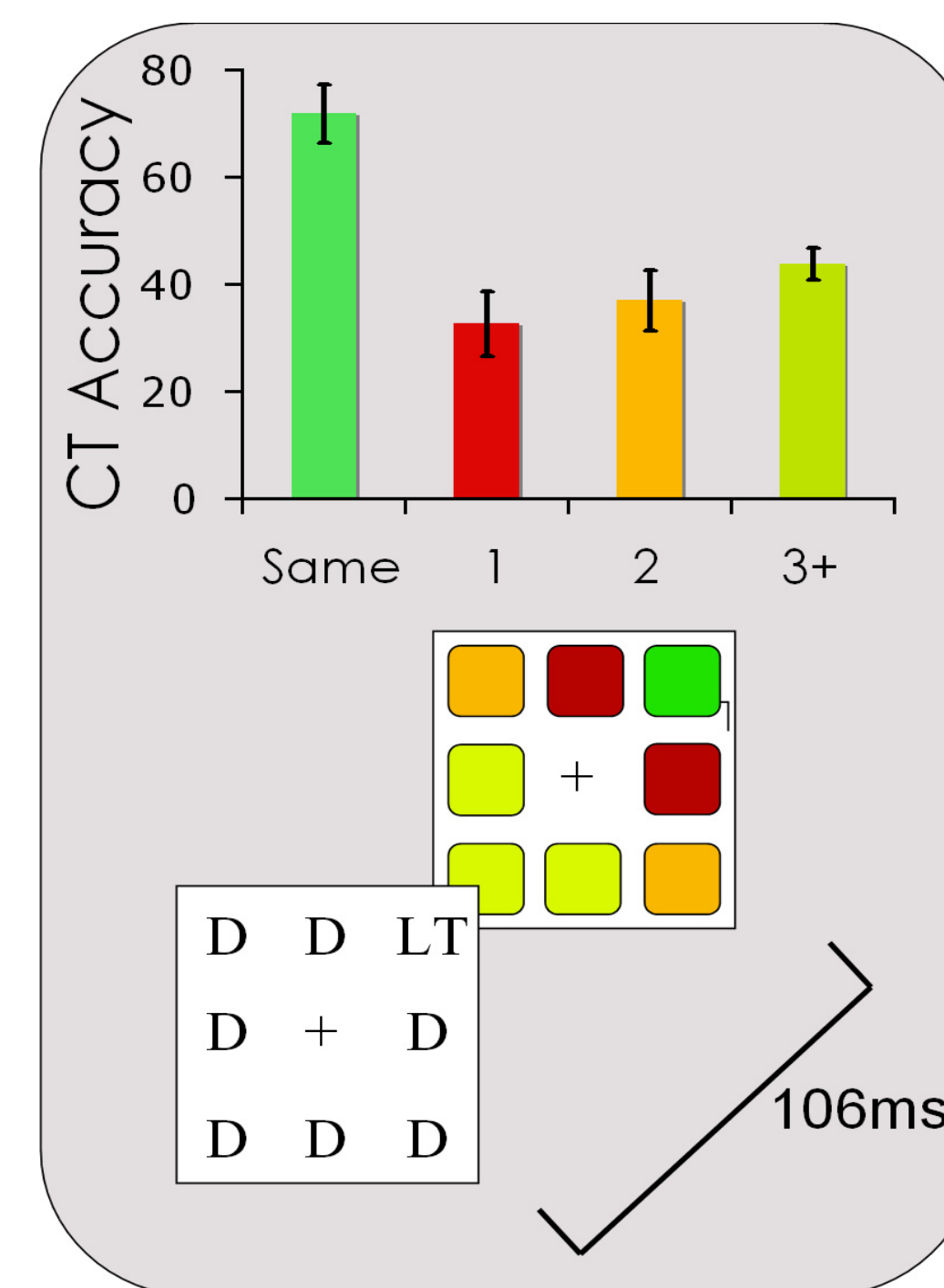
This suggests that attention was deployed prior to conscious target identification



An Inhibitory Surround

CT's are hardest to perceive near (but not on top of) the LT (Spearman $r = .11$, $p < .0003$)

Mounts (2000) found the same pattern when singletons capture attention



Experiment 2: Category Priming?

Subjects reported letters and digits

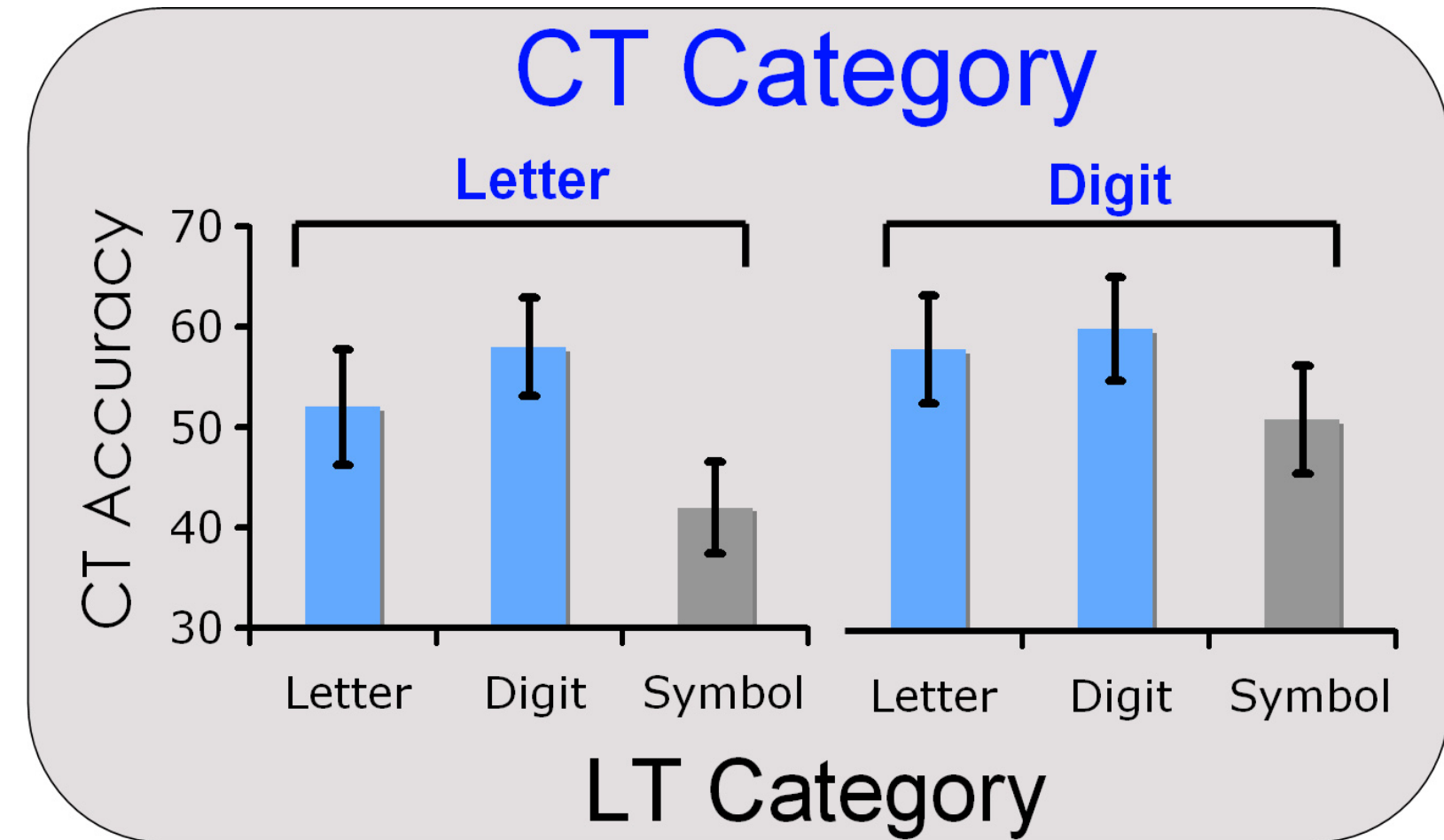
LT-CT SOA was 120 ms

LT enhanced CT accuracy across the category boundary

Main effect of LT category

$F(2,22) = 17.2$, $p < .001$

There was no LT x CT interaction
 $F(2,22) = .897$, $p = .4$



	Letter Critical Target			Digit Critical Target		
	LL	NL	DL	LN	NN	DN
LT	2(1)	4(1)		5(1)	3(1)	
CT	53(6)	59(5)	43(4)	58(5)	61(5)	51(5)
CT LT	53(6)	61(5)		61(5)	62(5)	
CT LT	--	--		10(10)	4(4)	

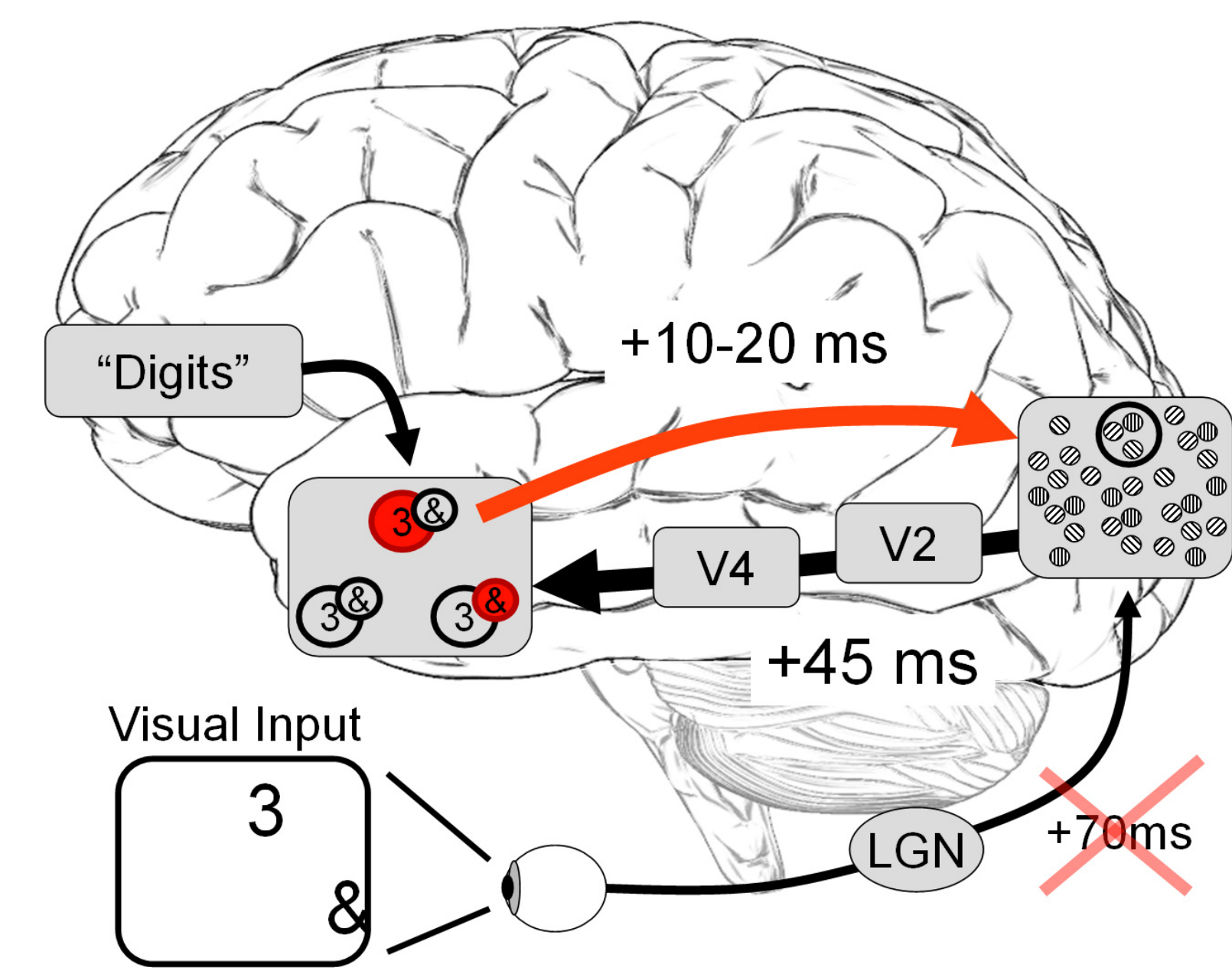
The FeedForward Sweep as a Trigger of Attentional Capture

Top Down control specifies the target set

Rapid, crude target identification occurs in IT cortex within 125ms of stimulus onset

This activation is specific to target identity and location

Hung, Kreiman, Poggio & DiCarlo (2005) Fast readout of object identity from Macaque inferior temporal cortex. *Science* 310: 863-866



What is Exogenous about Reflexive Attention?

Transient Attention

Sustained Attention

