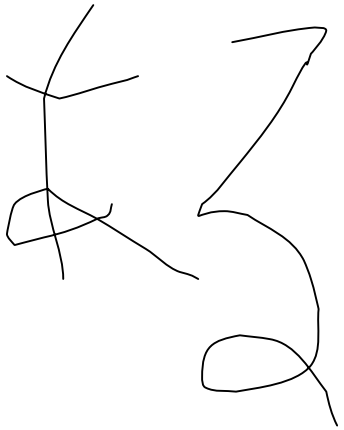
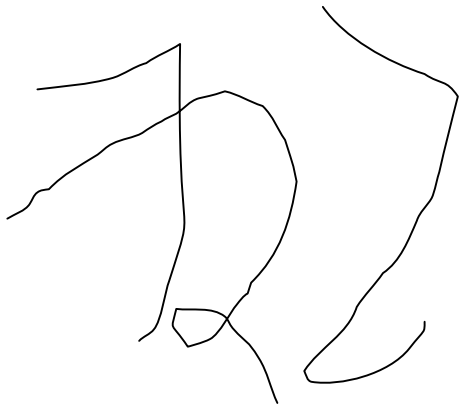
Visual Word Recognition

a ru



ne ko

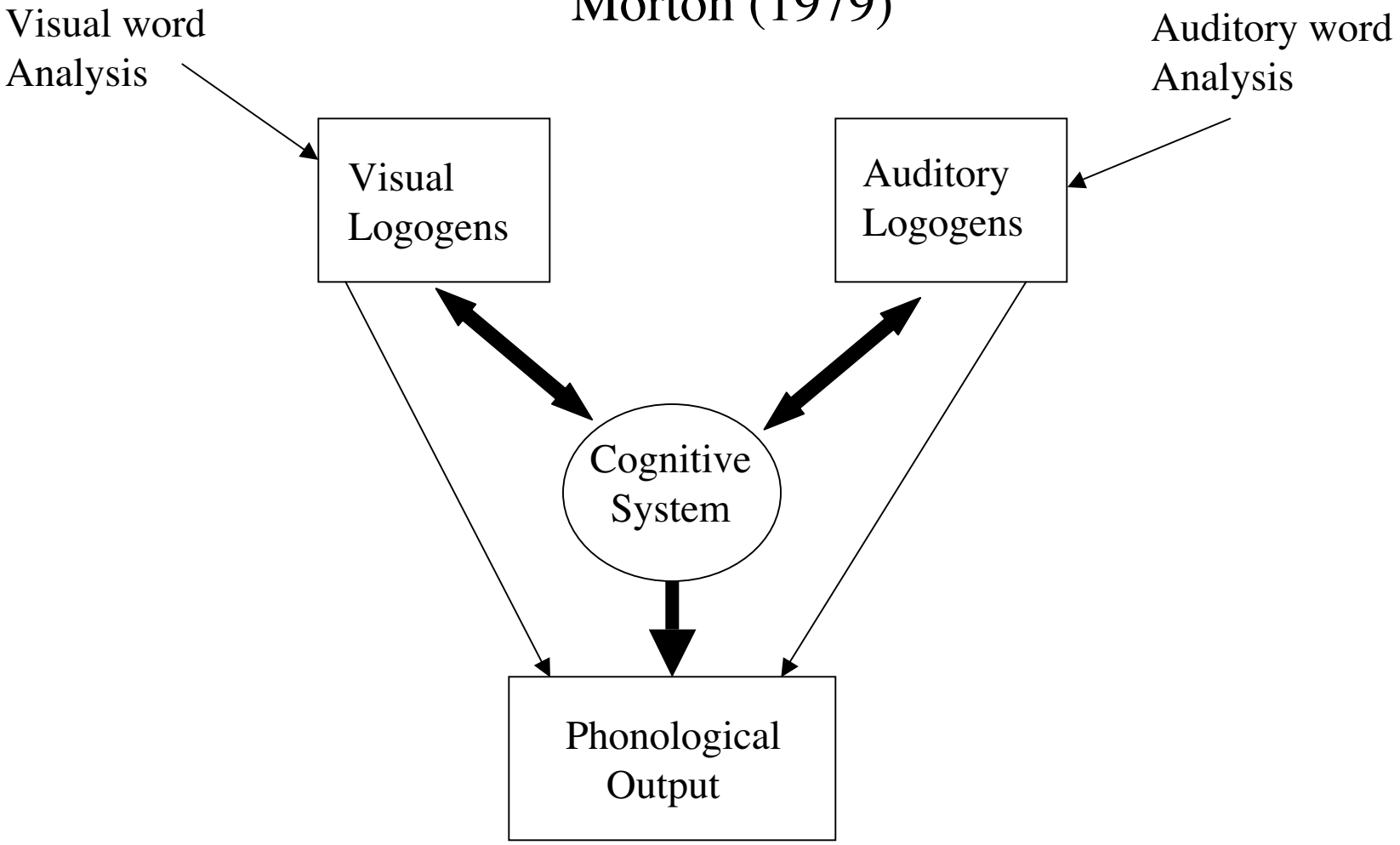


Japanese syllabary - Hiragana

Factors affecting speed and accuracy of visual word recognition:

1. Word frequency (also AoA, familiarity)
2. Stimulus quality - degraded stimuli slower
3. Length?
4. Lexical status - word vs. nonword
5. Priming - repetition, semantic, morphological
6. Neighborhood effects (LF)

Logogen Model (revised)
Morton (1979)



Tachistoscopic Word Recognition

XXXXXXXXXXX

prable

XXXXXXXXXXX

XXXXXXXXXXX

dinner

XXXXXXXXXXX

XXXXXXXXXXX

piano

XXXXXXXXXXX

XXXXXXXXXXX

xrlbn

XXXXXXXXXXX

Reicher-Wheeler paradigm for testing

Word Superiority Effect

XXXXXXXXXXX

talk

XXXXXXXXXXX

t

- - - -

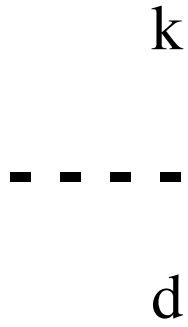
w

Test of Reicher-Wheeler

XXXXXXXXXXX

word

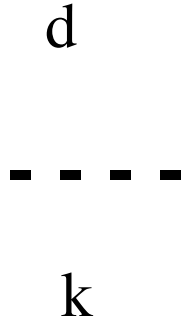
XXXXXXXXXXX


k
d

XXXXXXXXXXX

bdks

XXXXXXXXXXX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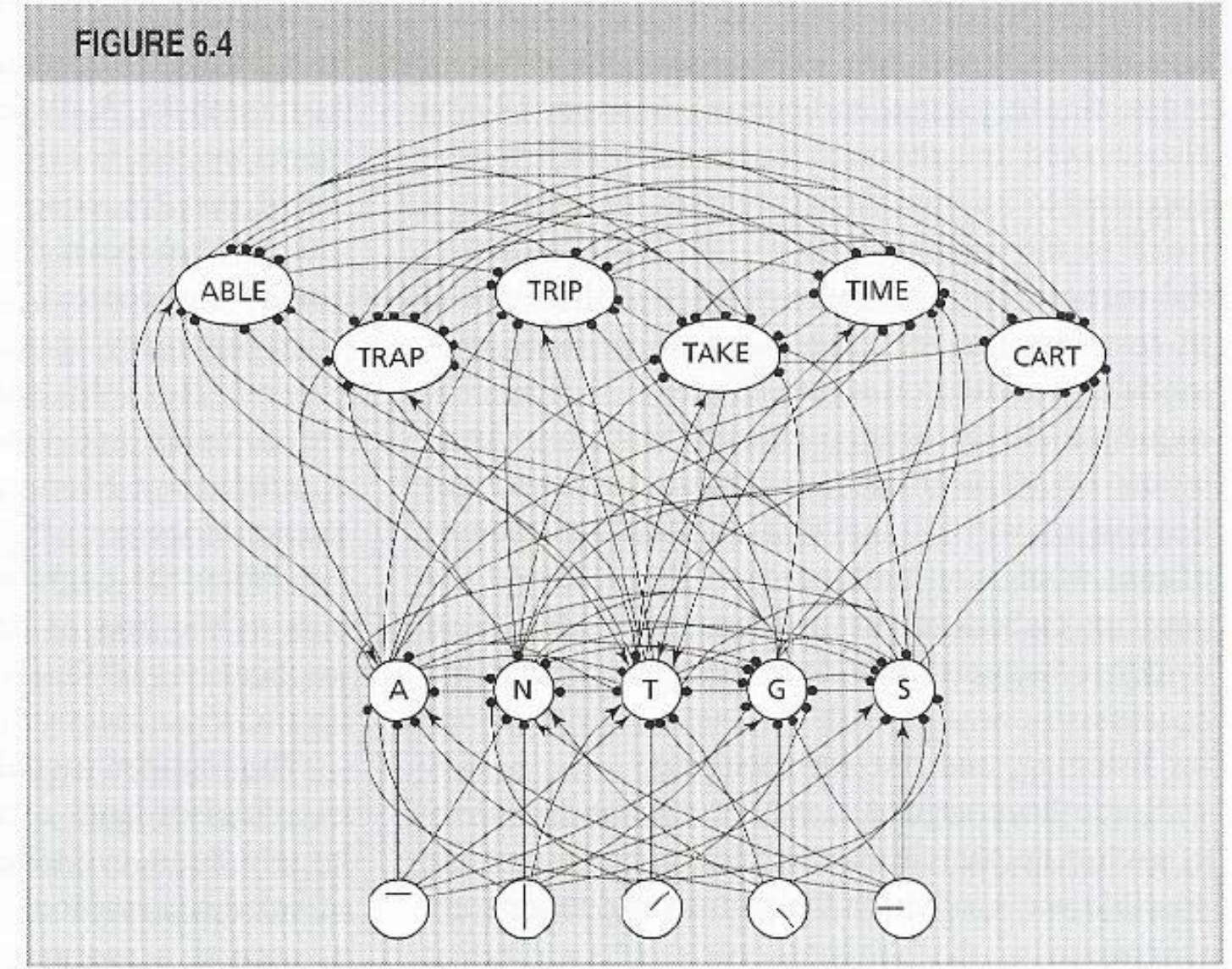
Letters in words recognized more accurately
than letters in nonsense strings

Interactive Activation and Competition
McClelland & Rumelhart (1981)



Comparison of Logogen and IAC

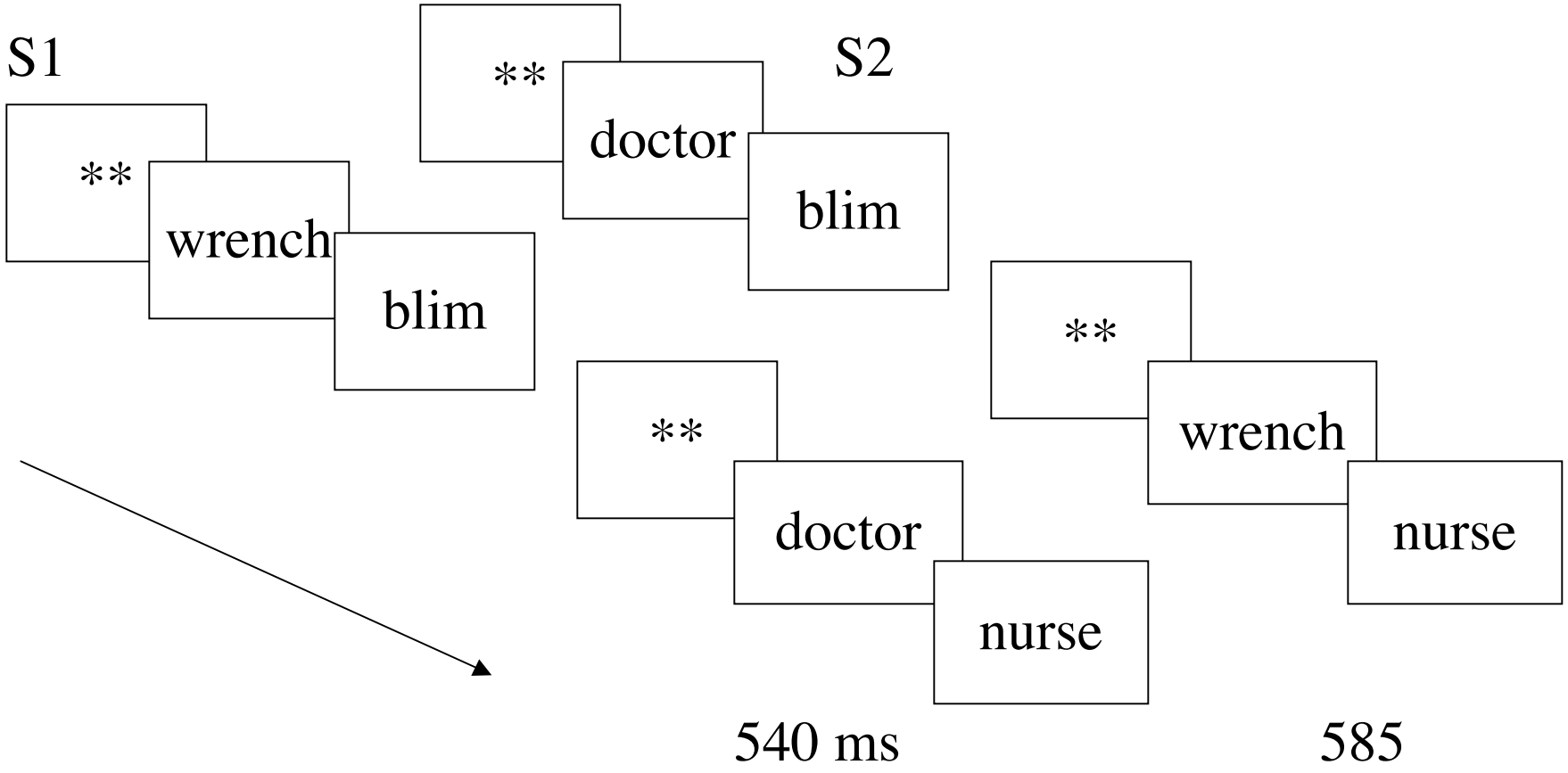
Similarities

- Word specific units
- Activation based model

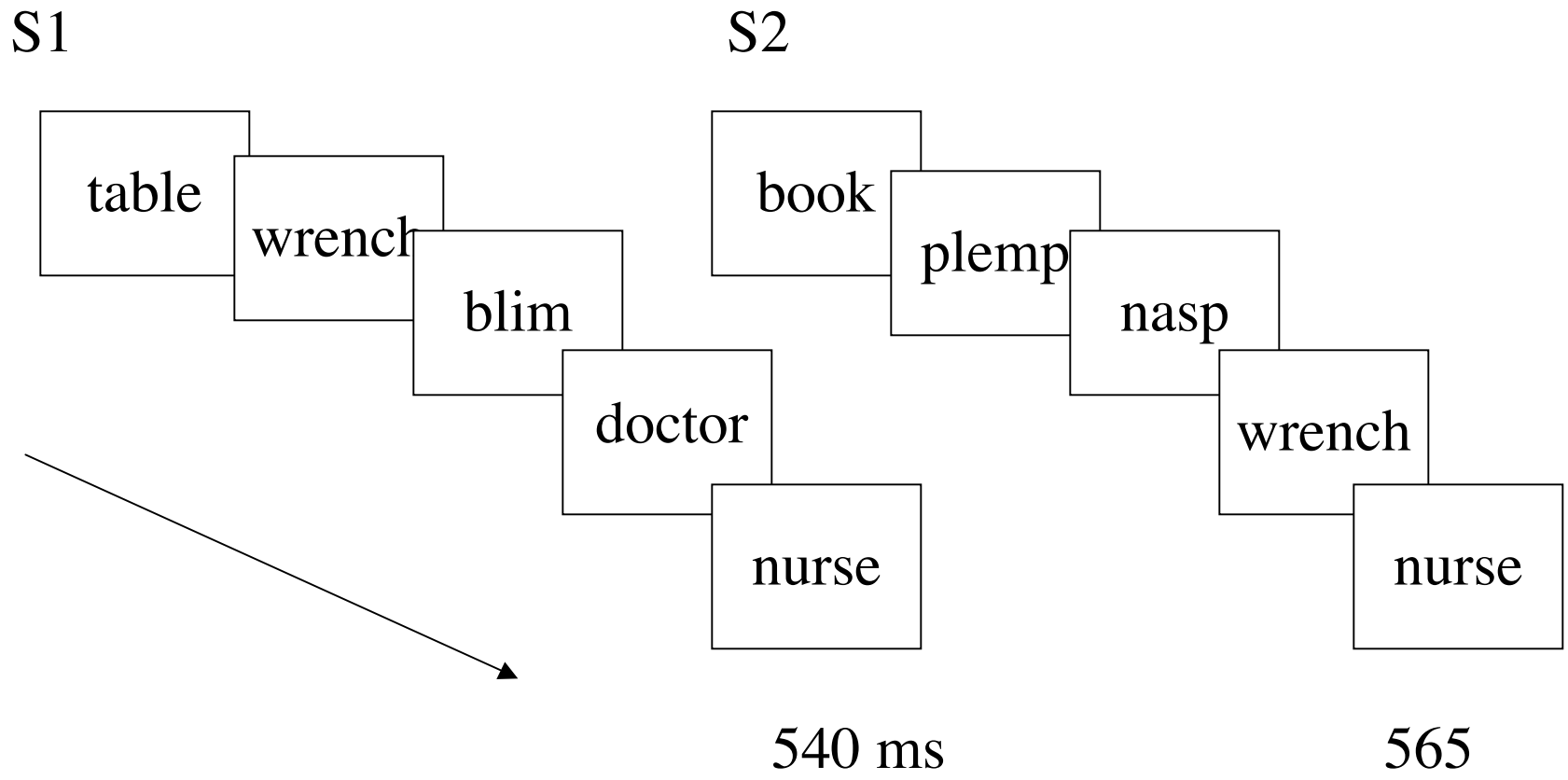
Differences

- Greater scope for logogen
- Feedback at all levels in IAC
- Inhibition in IAC for representations inconsistent with input

Semantic Priming
Paired Presentation- read first item of pair
Make lexical decision to second



Semantic Priming
Single presentation
(Word naming, lexical decision)



Semantic Priming

DOCTOR - NURSE

vs.

WRENCH - NURSE

Automatic spreading activation vs. controlled processing?

Evidence for controlled processing:
Relatedness proportion
Larger priming with longer SOA
Backward priming (hop - bell)
All greater in lexical decision than naming, greater with paired than single

Evidence for automatic spreading activation
Mediated priming in naming - winter - swim
Also, LD with low proportion, single presentation (Shelton & Martin, 1992)

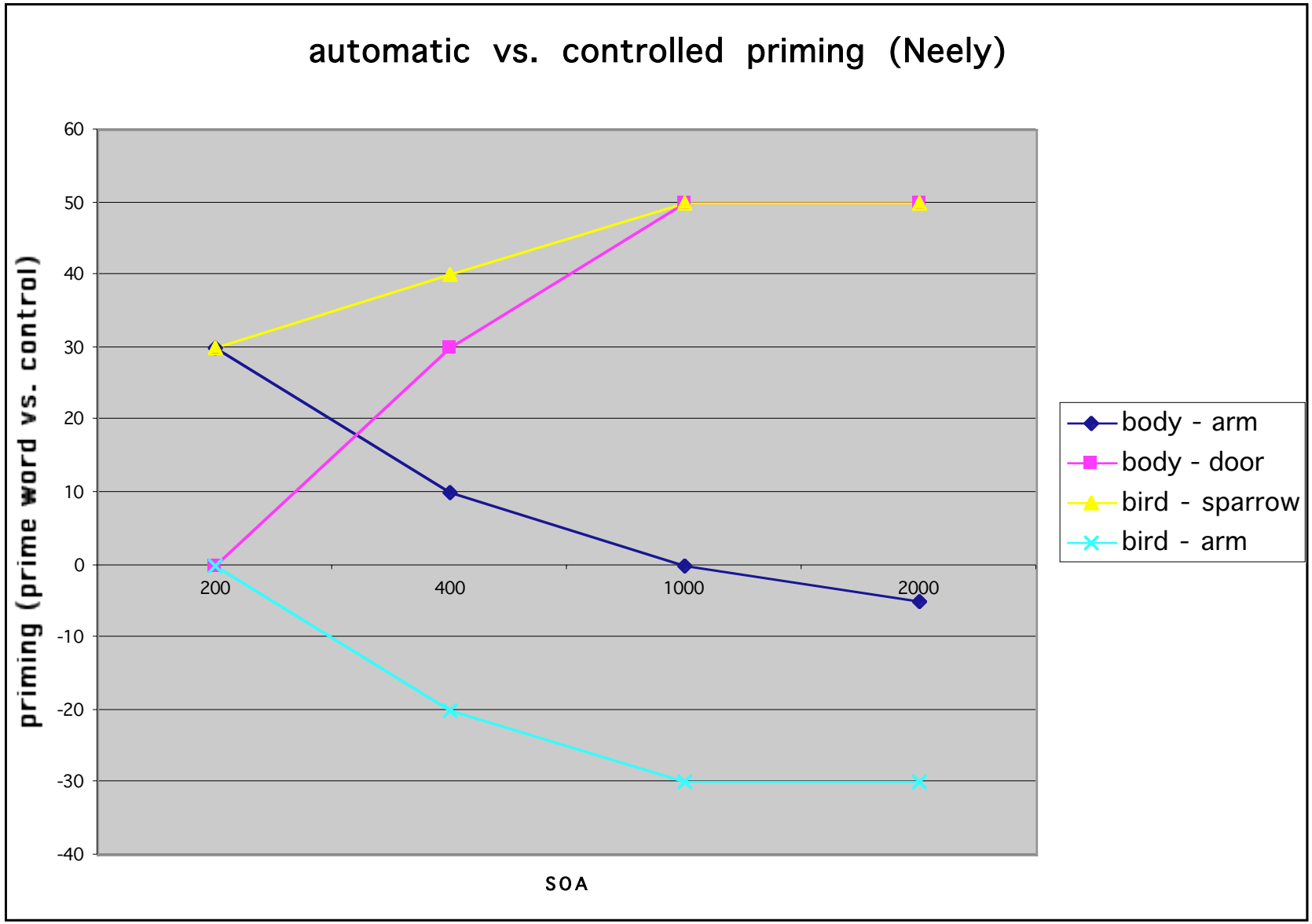
Neely (1977) - Bird prime,expect bird. Body prime, expect building part

Prime	Target	Expected
Bird	Robin	yes
Body	Door	yes
Bird	Arm	no
Body	Sparrow	no
Body	Arm	no
XXXX	Robin	no
XXXX	Door	no

Varied SOA between prime and target - 250 ms to 2000

Priming for Body - arm at short SOA not long
No inhibition at short SOA for unexpected (e.g., Bird - Arm, relative to baseline)
Inhibition at long SOAs

More recent work - inhibition at short SOAs (BLANK as neutral prime, highly expected target)


automatic vs. controlled priming (Neely)
priming (prime word vs. control)
60
50
40
30
20
10
0
-10
-20
-30
-40
200
400
1000
2000
SOA
body - arm
body - door
bird - sparrow
bird - arm

Semantic vs. Associative Priming
Shelton & Martin (1992)

Semantic, not associated: bread - cake

Semantic and associated: lion - tiger

Conditions favoring controlled processing (high proportion, paired presentation):

Priming for both types

Conditions favoring automatic processing (low proportion, single presentation):

Priming only for the associated pairs

Therefore, only associative priming is automatic

(controversial conclusion)

Lexical Ambiguity

"The stranger noticed the **bugs** in the apartment."

Bugs: insects, listening devices

David Swinney (1979)

Cross-Modal Priming

auditory "The stranger noticed the **bugs** in the apartment."

visual condition (time) →

immediate

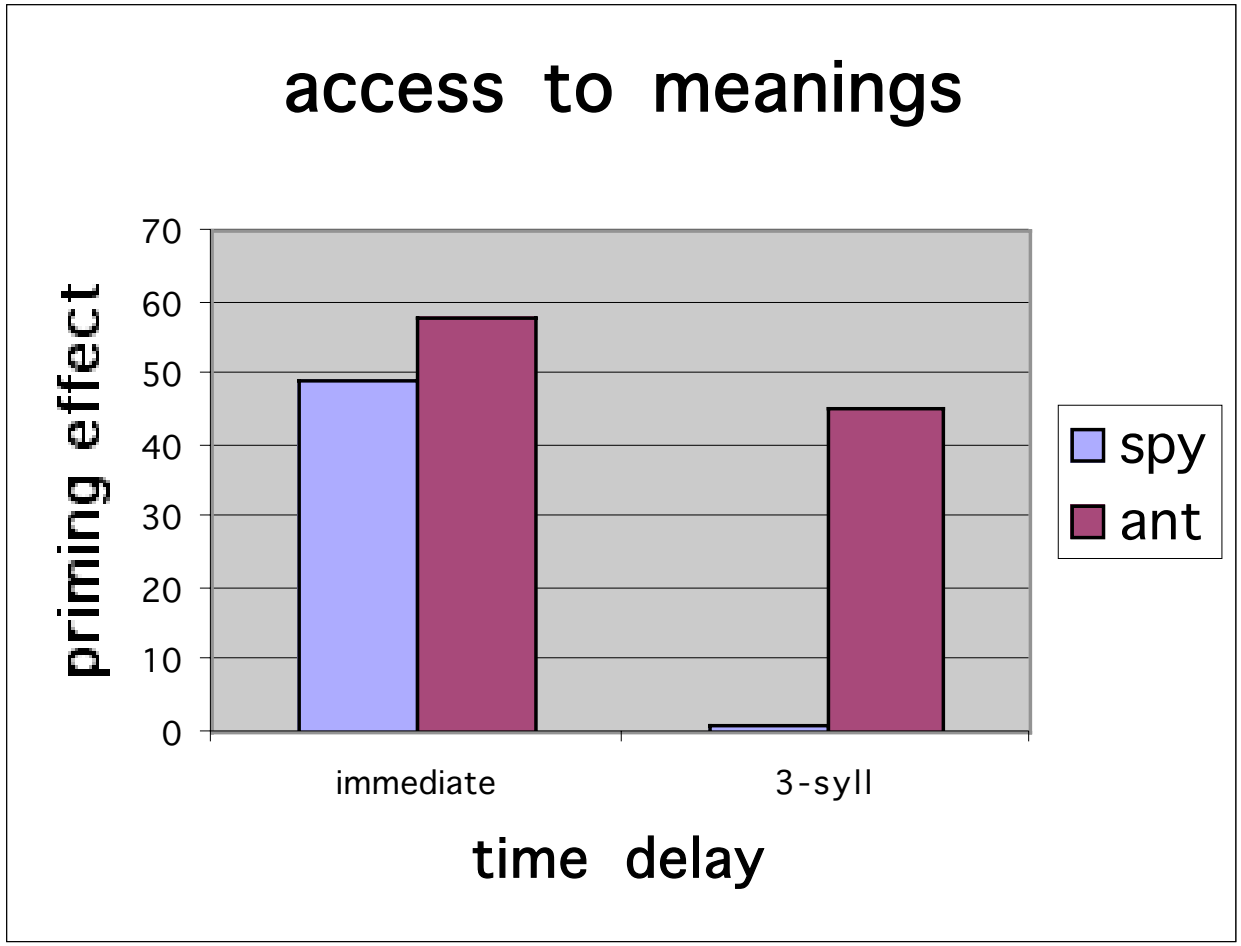
spy
ant
sew

3 syllables

spy
ant
sew

priming effect = unrelated - related

Swinney : Priming for both meanings initially



“The filthy apartment had roaches and other **bugs** in the cupboards”

auditory

visual condition (time) →

immediate

spy
ant
sew

3 syllables

spy
ant
sew

Swinney : Even with strong context, priming for both meanings initially

Later studies: Selective access to meaning with strong context and bias toward dominant (higher frequency) meaning

e.g., "date" girl-boy social event (dominant)
"date" fruit (subordinate)

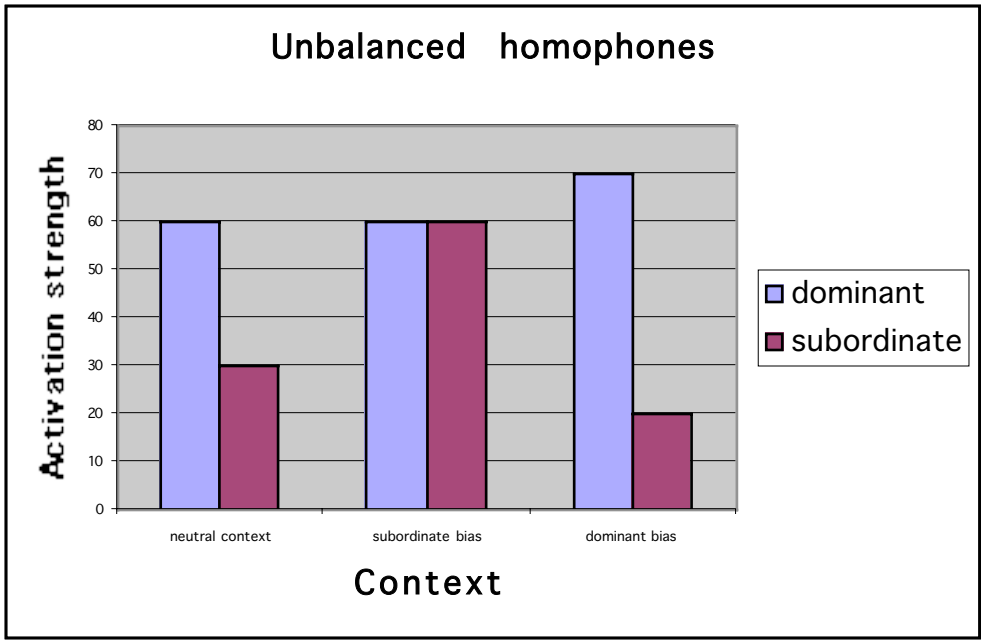
"The young couple went on their first date"
priming only for social related meaning

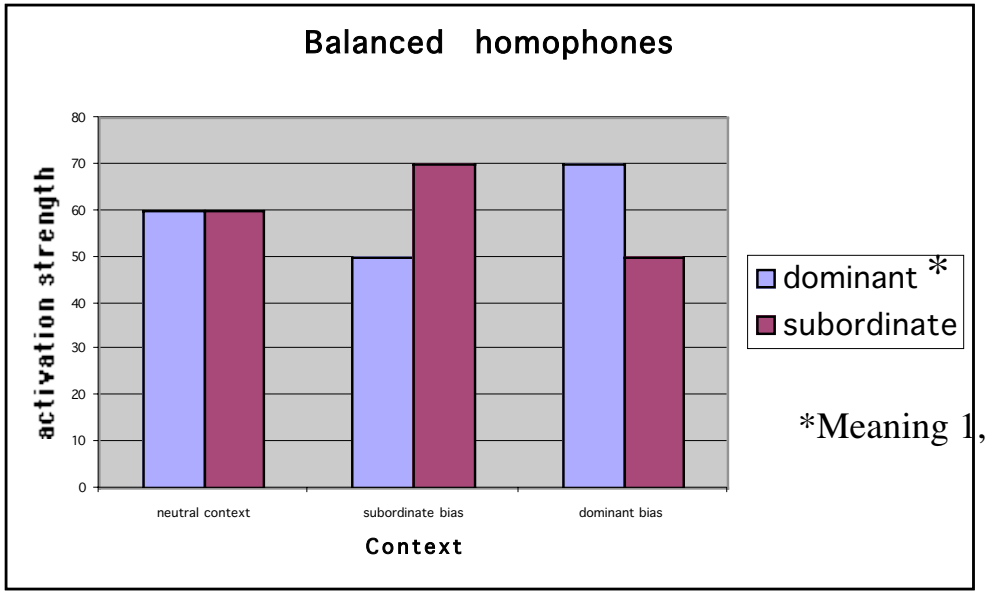
"The fruit plate included figs and a date"

priming for words related to both meanings

Reordered Access Model - Rayner

Finding:
With bias toward subordinate, eye fixations longer on ambiguous word than control word for unbalanced.
Equal to control word for balanced.





*Meaning 1, meaning 2

Priming from sentence context independent of word association?

The dog chewed on the ____

bone

cloud

Priming for bone due to dog-bone, chew-bone associations?

ERP effect - N400 component much larger for cloud than for bone

Van Petten (1993)

N400 to each word in a sentence - get smaller as more words processed. Hypothesis: reflects ease of integrating words into ongoing construction of meaning.

Congruent unassociated:

When the *insurance* investigators found out that he'd been drinking they *refused* to pay the claim.

Anomalous unassociated:
When the *insurance* supplies explained that he'd been complaining they *refused* to speak the keys.

Compare N400s to *insurance* and *refused* in two conditions. Reduction in N400 to refused much greater in congruent than incongruent, non-significant in incongruent.

Congruent associated:
When the *moon* is full it is hard to see many *stars* or the Milky Way.

Congruent unassociated:
When the *moon* is rusted it is available to buy many *stars* on the Santa Ana.

Compare N400s to moon and stars in two conditions. Reduction in N400 in both conditions, but larger in congruent associated. Therefore, two effects of context that are additive.