Semantic Integration and the Timecourse of Planning Complex Noun Phrases

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INTRODUCTION

How is phrase-planning coordinated during sentence production?


— Incremental models are faster given multiple options, because the earliest available option is used.

— Competitive models are slower given multiple options, because the alternatives compete for resources.


— Integration measures strength of relationship between phrase components. E.g., “the pizza with the yummy toppings” is tightly integrated, while “the pizza with the tasty beverage” is less so.

— Simultaneity models predict agreement errors increase with greater integration because features of the relevant nouns (“pizza,” “toppings”) will more often be active together and thus interfere with each other.

Goals

Compare incremental and competitive mechanisms in phrase-internal planning.

Examine potential interactions between integration and order constraint

Elicit and manipulate word exchange errors (e.g., Although murder is a form of suicide...—Garrett, 1975)...

— Often explained by assuming elements are simultaneously active and thus eligible for exchange

— Have not previously been elicited/manifested systematically in controlled experiments

METHOD

36 pictures varying in integration, each paired with 3 linking words (Flexible, Preferred, Unpreferred)

— Integration degree and linking word preferences determined with separate norming

3-stage procedure:

— Learning: each picture shown once with nouns (order counterbalanced); self-paced

— Training: each picture shown once, S said nouns aloud, nouns appear after 4 sec as check

— Testing: each picture shown once, with linking word; S described picture using linking word

7 picture-word SOAs (manipulated between-subjects): -750ms, -500, -250, 500, 1000, 1500, 2000

47-54 Ss at each SOA

— Training: each picture shown once, S said nouns aloud, nouns appear after 4 sec as check

— Learning: each picture shown once with nouns (order counterbalanced); self-paced

— Testing: each picture shown once, with linking word; S described picture using linking word

— Integration degree and linking word preferences determined with separate norming

Flexible the spot on the apple
Preferred the shelf and the sink
Unpreferred the apple with the spot

Unintegrated the apple on the spot
Preferred the shelf above the sink
Unpreferred the shelf below the shelf

PREDICTIONS (cont’d)

Exchange Errors

Exchange Error Rate = Exchanges / (Exchanges + Correct)

Coded as Correct:

Exact the spot on the apple
Full the apple on the spot
Partial the apple on, I mean...

Coded as Exchanges:

Integ Pref
Unint Unpref
Integ Unpref
Integ Pref
Unint Pref
Unint Unpref

Results & Discussion

Support for simultaneity: More errors for integrated than unintegrated at all SOAs.

Integration x Preference interaction for long SOAs: Suggests T1 is delayed in unpreferred cases. Delay will be longer for integrated, but then original N1 will still be active, resulting in increased errors.

Speech Onset Time

Includes only Correct trials; trimmed at 4 SD within each subject

REFERENCE & ACKNOWLEDGMENTS


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