

Getting real about Semantic Illusions: Rethinking the functional role of the P600 in language comprehension

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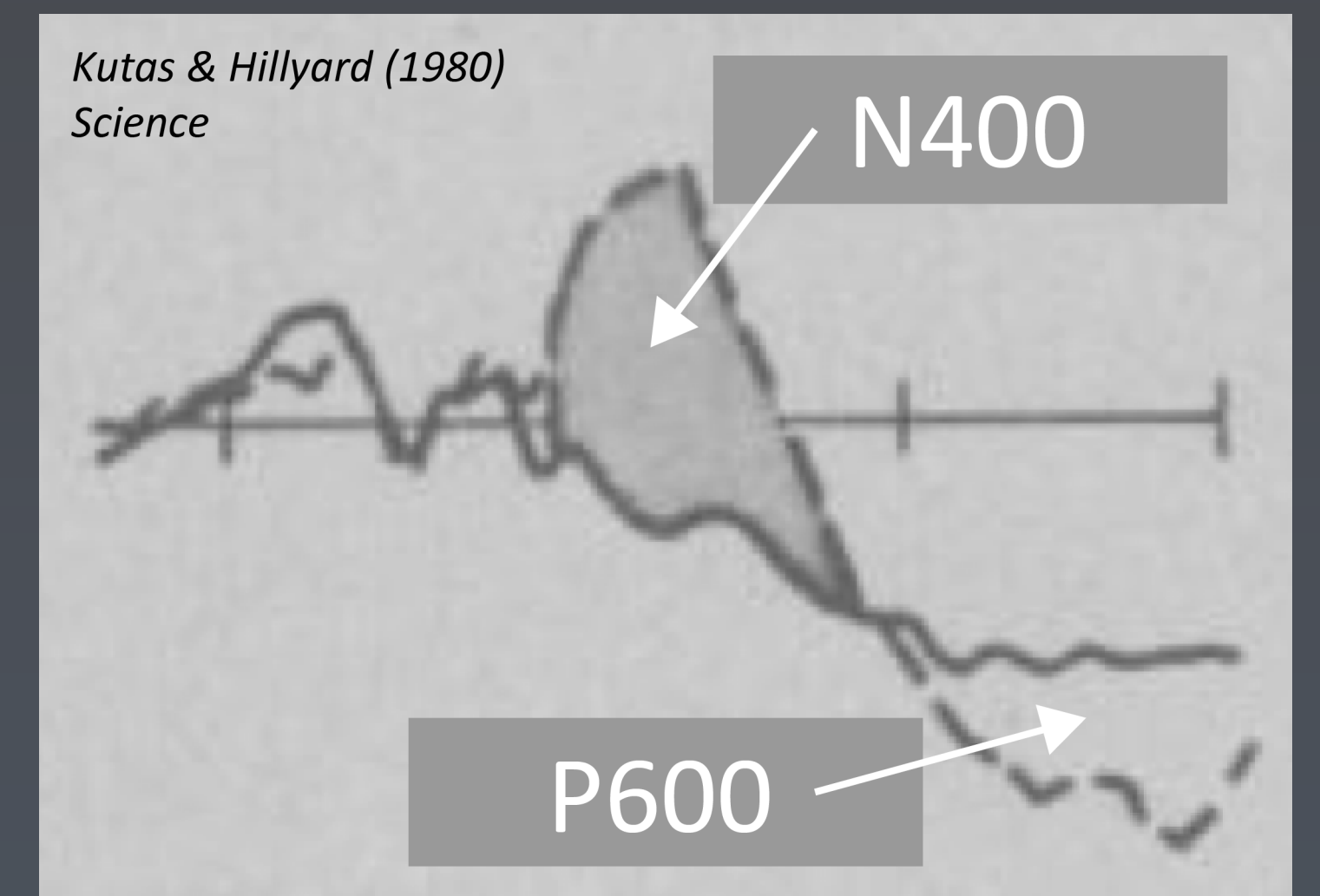
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A new perspective on ERPs

N400 is ~~semantic integration~~ → lexical retrieval

P600 is ~~syntactic processing~~ → semantic integration



The “Semantic Illusion” phenomenon

Kim & Osterhout (2005)
J. Mem. Lang.

The hearty meal was devouring/devoured

Expected: N400-effect, no P600-effect – Observed: P600-effect, no N400-effect

Multi-stream accounts

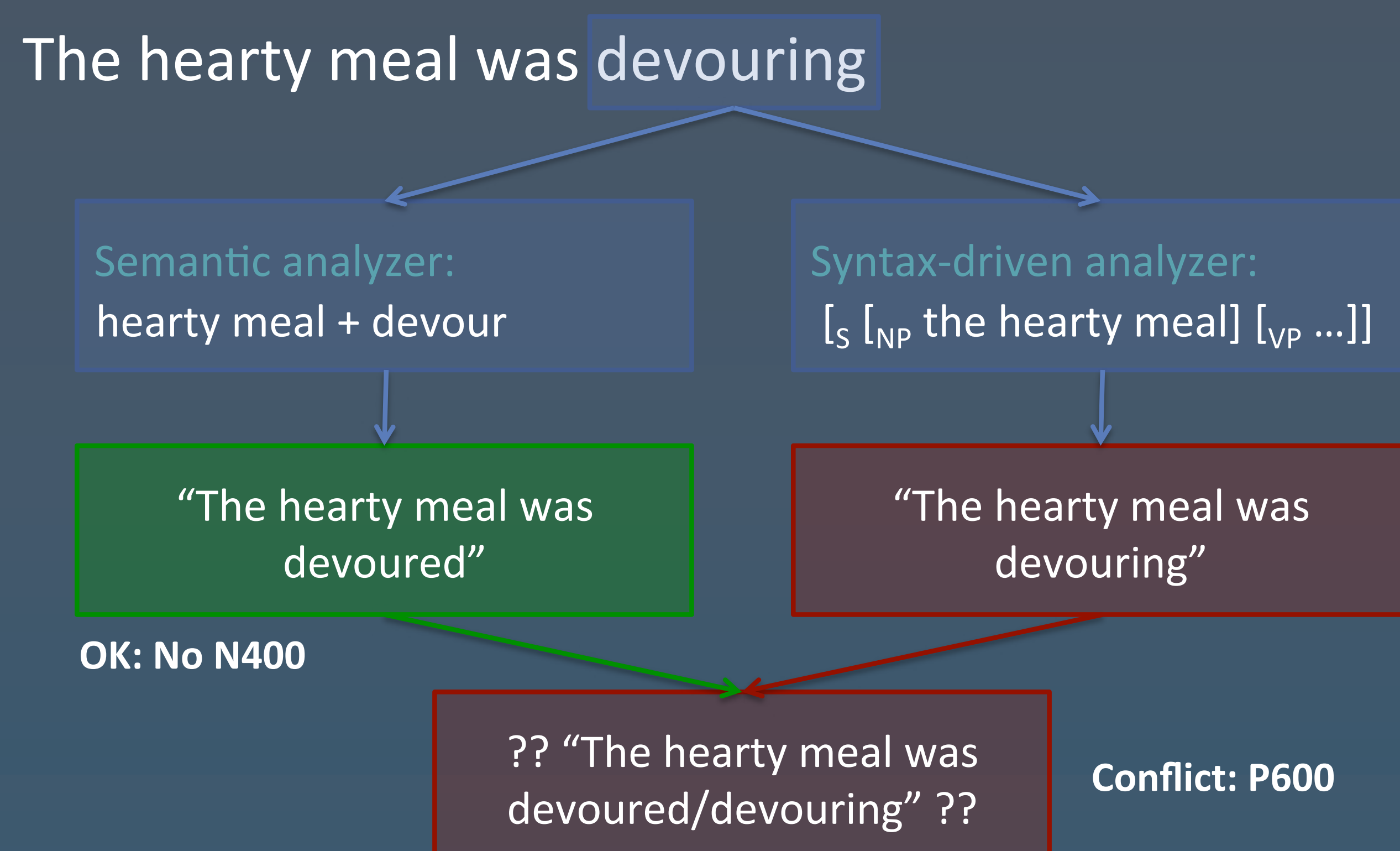


Table 2 – Model predictions (SA = Semantic Attraction; MT = Monitoring Theory; CGA = Continued Combinatory Analysis; eADM = extended Argument Dependency Model; PC = Processing Competition, and RI = Retrieval-Integration account. N4 = N400 and P6 = P600. Gray cells indicate wrong predictions, and the cell containing question marks denotes that no predictions could be made.). See text for literal translation of the items.

Item(s)	Observed	SA	MT	CCA	eADM	PC	RI
Hoeks et al. (2004)							
De speer werd door de atleten geworpen	—	—	—	—	—	—	—
De speer heeft de atleten geworpen	P6	P6	P6	P6	P6	P6	P6
De speer werd door de atleten opgesomd	N4/P6	N4	N4	N4	N4/P6	P6	N4/P6
De speer heeft de atleten opgesomd	N4/P6	N4	N4	N4	N4/P6	P6	N4/P6
Kim and Osterhout (2005)							
The hearty meal was devoured...	—	—	—	—	—	—	—
The hearty meal was devouring...	P6	P6	P6	P6	P6	N4	P6
The dusty tabletops were devouring...	N4/(P6) ^a	N4	N4	P6	N4/P6	N4	N4/P6
van Herten et al. (2005)							
De stroper die op de vos joeg...	—	—	P6	P6	P6	P6	—
De vos die op de stroper joeg...	P6	—	—	—	—	—	—
Kuperberg et al. (2007)							
For breakfast the boys would eat...	—	—	—	—	—	—	—
For breakfast the boys would watch...	N4	N4	N4	N4	N4	N4	N4
For breakfast the eggs would eat...	P6	P6	P6	P6	P6	P6	P6
For breakfast the eggs would watch...	(N4)/P6	N4	N4	P6	P6	P6	(N4)/P6
Kos et al. (2010)							
Fred eet een boterham...	—	—	—	—	—	—	—
Fred eet een restaurant...	N4	N4	N4	N4	P6	N4	N4/(P6)
Fred eet in een restaurant...	—	—	—	—	—	—	—
Fred eet in een boterham...	N4	N4	P6	N4	??	N4	N4/(P6)
Nieuwland and van Berkum (2005)							
Prior context...	—	—	—	—	—	—	—
Next, the woman told the tourist...	—	—	—	—	—	—	—
Next, the woman told the suitcase...	P6	N4	N4	N4	N4/P6	N4	P6

^aStroud (2009) found a biphasic N400-P600 in response to this condition.

The MRC hypothesis

Brouwer et al. (2012)
Brain Res.

P600 is construction or updating of a Mental Representation of what is Communicated (MRC)

P600 amplitude (MRC construction effort) is sensitive to referent introduction, thematic role assignment, garden-paths, agreement-errors, irony, and world-knowledge violations

Predictions: P600 amplitude correlates with behavioral measures, is strongly task-dependent, and increases at phrase and sentence boundaries (including prosodic boundaries)