Indexing the N400 and the P600 in a Computational Model of Sentence Comprehension

Harm Brouwer (brouwer@coli.uni-sb.de), Noortje J. Venhuizen, and Matthew W. Crocker
Saarland University

Semantic Anomaly and Expectancy

George had been fired, but he couldn’t tell his fog/family/wife

"Semantic P600"-effects

The hearty meal was devouring/devoured [...]

Retrieval-Integration account

P600 = Δ activity from t-1 to t

N400 estimates

integration_context (250)

integration_output (300)

retrieval_output (100)

retrieval (150)

input (48)

Surprisal = -log P(DSS_t | DSS_{t-1})

utterance interpretation (DSS)

context established at timestep t-1

word perceived at timestep t

Syntactic Violations

The famous dancer were/was [...

Garden-paths

The lawyer charged [that] the defendant was [...

Frank et al. (2003)

Molinaro et al. (2008)

Kutas et al. (1984)

Kim & Osterhout (2005)

Brouwer et al. (2012)

Venhuizen et al. (in press)