Research Question
To predict the memory load of sentence-initial NPs in Japanese sentence comprehension, should models use:
• linear dependencies only (e.g., Dependency Locality Theory or DLT; Nakatani & Gibson, 2010; Gibson, 1998, 2000)?
• or also include detailed syntactic structures? (based on a left-corner parser; e.g., Abney & Johnson, 1991)

Parsing models for Japanese
• People process sentences incrementally, that is, they build representations without delay as each word is read or heard (Marslen-Wilson, 1975).
• Dependency Locality Theory for Japanese (Nakatani & Gibson, 2010): 
  - working-memory load: determined by dependency relations alone 
  - Memory load: contingent on the number of constituents needed to complete the sentence.

Sentence-initial NPs and working memory load
NP (nom) → Both predict Verb to complete sentence
The same Memory load to keep the prediction active until it is satisfied

Predictions
Left-corner parsing model:
RTs to the critical region (locative adjunct) longer in (b) the Dative NP condition.
DLT (Nakatani & Gibson, 2010):
No difference between the two conditions. (Both costly)

Results
Longer Reading Times in (b) the Dative NP condition
Support left-corner parsing model, against DLT.

Caveat
The load observed in the critical region might be due to the non-canonical word order of the locative adjunct.
• In the canonical order, locative adjuncts precede objects in the VP.
(Ogawa & Niimura, 2012)
⇒ This possibility is addressed in Experiment 2.

Discussion
• Greater memory load at intervening phrase in the Dative NP condition only.
• Sentence-initial Dative NPs lead to the prediction of the verb, but sentence-initial Nominative NPs do not.
• Models that consider dependency relations alone cannot explain the result.
• Results are compatible with a model that uses detailed syntactic structures to predict memory load.