Planning units in Tagalog sentence production: Evidence from eye tracking

Sebastian Sauppe, Elisabeth Norcliffe, Agnieszka E. Konopka, Robert D. Van Valin, Jr and Stephen C. Levinson

Introduction
To transform thoughts into speech, speakers must encode preverbal messages linguistically. What is the timescale of message and sentence formulation for sentences like “The child kicks the ball”? In English, this can happen one word at a time. Speakers can begin uttering sentences after having encoded only the sentence initial NP ([1]). How does formulation proceed in languages where the sentence initial element overtly marks a dependency with other elements of the sentence, such as Tagalog?

Tagalog
Tagalog is spoken by approx. 23 million speakers in the Philippines. It belongs to the Western Malayo-Polynesian branch of the Austronesian language family.

Task
- 53 native Tagalog speakers described drawings of transitive events ([2]).
- Their gaze and speech were recorded (Tobi T120 eye tracker, 120 Hz sampling rate).

Sentence structure in Tagalog
- Tagalog has a verb-initial word order.
- Transitive events can be described using different syntactic structures (see a–c below).
- The verb can carry actor marking (i.e., the verb agrees in semantic role with the actor) or patient marking (i.e., the verb agrees in semantic role with the patient).
- There are no syntactic constraints on post-verbal NP ordering ([3]).

Sentences differing in verb marking:
(a) actor marking with verb AM  actorSUBJ  patientOBJ
verb_{AM} s<um>isipa ng=bola ang=bata
<AM>kick OBJ=ball SUBJ=child
"The child kicks the ball."
(b) actor marking with verbPM  actorOBJ  patientSUBJ
verb_{PM} s<n>isipa ang=bata ng=bola
<PM>kick OBJ=child SUBJ=ball
"The child kicks the ball."
(c) patient marking with verb_{PM}  actorSUBJ  patientOBJ
verb_{PM} s<n>isipa ng=bola ang=bata
<PM>kick OBJ=ball SUBJ=child
"The child kicks the ball."

Analysis 1
- Sentences differing in verb marking and word order:
(a) actor marking with verb_{AM}  patientOBJ  actorSUBJ
verb_{AM} s<um>isipa ng=bola ang=bata
<AM>kick OBJ=ball SUBJ=child
"The child kicks the ball."
(b) actor marking with verb_{PM}  actorOBJ  patientSUBJ
verb_{PM} s<n>isipa ang=bata ng=bola
<PM>kick OBJ=child SUBJ=ball
"The child kicks the ball."
(c) patient marking with verb_{PM}  actorSUBJ  patientOBJ
verb_{PM} s<n>isipa ng=bola ang=bata
<PM>kick OBJ=ball SUBJ=child
"The child kicks the ball."

Analysis 2
- Sentences differing in verb marking:
(a) actor marking with verb_{AM}  patientOBJ  actorSUBJ
verb_{AM} s<um>isipa ng=bola ang=bata
<AM>kick OBJ=ball SUBJ=child
"The child kicks the ball."
(b) actor marking with verb_{PM}  actorOBJ  patientSUBJ
verb_{PM} s<n>isipa ang=bata ng=bola
<PM>kick OBJ=child SUBJ=ball
"The child kicks the ball."
(c) patient marking with verb_{PM}  actorSUBJ  patientOBJ
verb_{PM} s<n>isipa ng=bola ang=bata
<PM>kick OBJ=ball SUBJ=child
"The child kicks the ball."

Analysis 3
- Sentences differing in word order:
(a) actor marking with verb_{AM}  patientOBJ  actorSUBJ
verb_{AM} s<um>isipa ng=bola ang=bata
<AM>kick OBJ=ball SUBJ=child
"The child kicks the ball."
(b) actor marking with verb_{PM}  actorOBJ  patientSUBJ
verb_{PM} s<n>isipa ang=bata ng=bola
<PM>kick OBJ=child SUBJ=ball
"The child kicks the ball."

Questions
- To what extent do speakers encode the subject at the outset of sentence formulation?
- Is this influenced by the type of verb marking, i.e., actor marking vs. patient marking (Analyses 1 and 2)?
- Is this influenced by post-verbal NP order (Analyses 2 and 3)?

Conclusions
- Two observable phases in Tagalog sentence production:
  early phase involving planning of the dependency relation between the verb and the subject (i.e., the verb marking)
  later phase involving incremental encoding of characters in the order of mention, as in English
- Fixation patterns provide evidence for:
  - temporal dissociation of mapping of message-level concepts to syntactic functions and lexical encoding of these concepts
  - linguistic guidance in the earliest stages of sentence production in Tagalog

More information: sebastian.sauppe@mpi.nl

References