

Search for a Minimal Agent Predicate Link preference in Recursive Agent Distribution Strategy for Embedded Clauses.

Abhijit Debnath¹ & Gautam Sengupta²

^{1,2}Centre for Neural and Cognitive Sciences,
University of Hyderabad.

Email: ¹ discoveryabhijit@gmail.com, ² gsghyd@gmail.com

Keywords: *Experimental Syntax, Initial Control Preference, Agent-Predicate Links.*

Summary:

The current paper reports two reading experiments in Bangla, (also introducing an ongoing ERP experiment) carried out in order to ascertain whether a *Minimal Agent-Predicate Association* could be a the default preference that results in increase of processing complexity when the number of association links between any agent and the predicates of the sentence (which are the verbs either in matrix clause or embedded clause) increases. Bangla provides a more sensitized design for the tests by providing the location of the matrix verb (having control information) at the end of a sentence (like Japanese).

Introduction:

Studies in initial preference of control in Spanish show that the language processor seems to have a significant preference toward Object Control compared to Subject Control (Betancort et al. 2006) suggesting the preference for a structurally close antecedent for PRO. Japanese control sentences showed that in case of a retrieval task that followed stimulus control sentences, matrix clause objects rather than subjects are capable of being recalled and retrieved more easily and accurately as the antecedents for PRO (Sakamoto 2001) in both canonical as well as scrambled word order. The relevance of these inferences are tested in Bangla.

1. Experiment 1:

Processing difference of the two types of verb was measured, (for RT of button-press activity in a masked self-paced reading, in *msec*), for two types of sentences. One required a dropped *pro* at the subject position of the embedded clause and the other required a controlled PRO in the embedded clause.

- (1) arun_i ama-ke_j bole-ch-e [*pro*_{i/j/*k} kaal bikel-e gaRi bhaRa kor-e kolkata-y aS-be] ^(FINITE EMBEDDED CLAUSE)
Arun 1Sg-Dat/Acc tell-pst-3rd [*pro* tomorrow evening-loc car rent do-ppl kolkata-loc come-fut(3rd)]
Arun told me (that) *he* will come to Kolkata by car, tomorrow evening.
- (2) arun_i ama-ke_j bole-ch-e [PRO_{i/j/*k} kaal bikel-e gaRi bhaRa kor-e kolkata-y aS-_{te}] ^(EMBEDDED CONTROL CLAUSE)
Arun 1Sg-Dat/Acc tell-pst-3rd [PRO tomorrow evening-loc car rent do-ppl kolkata-loc come-inf]
Arun told me to come to Kolkata by car, tomorrow evening.

Comparison of RT at the last word showed a preference for V-_{te} (Mean-RT: V-_{te} (926.4 msec) < V-be (1118.0 msec), difference of mean = 191.6 msec, t-value > 2). The second experiment however was a pseudo-replication Sakamoto's experiment using both canonical and scrambled word orders and measuring on-line RT at the last word (which is the control verb).

2. Experiment 2:

Difference in RT was measured at the two types of verb (in *msec*) at the end, in object Control and subject control sentences. Both canonical as well as scrambled word order were used.

- (1) ami_i o-ke_j [PRO_{i/j/*k} boi-Ta di-te] baddho kor-l-am ^(OBJECT CONTROL)
1stSgNom 3rd-Dat/Acc [PRO book-Cl give-inf] compel do-pst-1st
I compelled him to give *someone* the book.
- (2) ami_i [PRO_{i/*j/*k} o-ke boi-Ta di-te] baddho ho-l-am ^(SUBJECT CONTROL)
1stSgNom [PRO 3rd-Dat/Acc book-Cl give-inf] compel be-pst-1st
I was compelled to give him the book.

Results showed a preference for object controlled PRO (Mean-RT: *kor-l-am* (1627 msec) < *ho-l-am* (2113 msec), difference of mean = 486 msec, t-value > 2) across both word orders.

Analysis and Discussion:

Findings seem to indicate that this consistent on-line processing preference is actually due to a preference towards a minimal number of agent-predicate links, required to be associated by the processor and not any distance factor or grammatical function of an antecedent. (1.1) requires the processor to associate the subject 'Arun' as an agent of two predicates, 'bole-ch-e' as well as the embedded 'aS-be'. Likewise in (2.2), the subject 'ami' has to be associated as an agent of 'baddho ho-l-am' as well as the embedded 'di-te'. Thus, diverging associations emerge from the matrix agent to both matrix as well as embedded predicates. (1.2) however requires the subject 'Arun' to be associated with only one predicate, 'bole-ch-e' and the object 'ama-ke' with only one predicate, 'aS-te'. Likewise in (2.1), the subject 'ami' is to be associated with 'baddho kor-l-am' and 'oke' to be associated with the embedded 'dite'. Increase in the number of agent-predicate links seems to in-turn increase the processing cost (which is less in case of object control in both the experiments due to lesser number of agent predicate links). This work argues for a *Minimal Agent Predicate Link* preference, discussing why neither structural factors nor grammatical function can be considered as the only criteria to explain the preference toward object control.

References

- Betancort, M., Carreiras, M. and Acuna-Farina, C (2006) "Processing controlled PROs in Spanish," *Cognition*, 100 217–282.
- Betancort, M., Meseguer, E. and Carreiras, M (2004) "The empty category PRO: Processing what can't be seen," *The on-line study of sentence comprehension: Eyetracking, ERP, and beyond*, eds. M. Carreiras, and C. Clifton (eds.), Brighton: Psychology Press.
- Sakamoto, T (2001) "Processing Filler-gap Constructions in Japanese: The Case of Empty Subject Sentences," *Sentence Processing in East Asian Languages*, ed. Mineharu Nakayama, 189-221. CSLI Publications.