Dissertation Summaries

Kalliopi Katsika. Sentence processing strategies in children and adults: PP Attachment in corpora and psycholinguistic experiments. Aristotle University of Thessaloniki, 2009. [kkatsika@enl.auth.gr]

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1 Introduction

A very important goal of psycholinguistic research is to unravel the architecture and mechanisms of language comprehension. Sentence comprehension is a very rapid process which involves the immediate construction of incoming constituents into larger syntactic and semantic units. It is generally believed that sentence processing occurs incrementally, in a word-by-word fashion, and that the human sentence processor (parser) starts building constituent structures and interpretations the moment each word is heard or read (e.g. Marslen-Wilson 1973, 1975). The incremental nature of sentence comprehension may create brief ambiguity even to strings of spoken or written language that are unambiguous upon the completion of a sentence. Structural ambiguity thus provides a way to investigate the mechanisms that underlie the operation of the parser (Frazier 1979).

This thesis examines a specific type of structural ambiguity, namely the Prepositional Phrase (PP) attachment ambiguity. Even though a considerable amount of research has been conducted on PP attachment ambiguities in English (Altmann & Steedman 1988, Britt 1994, Clifton, Speer, & Abney 1991, Rayner, Carlson, & Frazier 1983, Schütze & Gibson 1999, Taraban & McClelland 1988, to name a few), little research can be found in languages other than English (French-Mestre & Pynte 1997, Konieczny, Hemforth, Scheepers, & Strube 1997, for French and German respectively) and no research on attachment preferences in V-NP-PP structures has been previously conducted in Greek.

The main aim of this thesis is to investigate the extent to which native Greek speakers’ parsing decisions for temporary ambiguous prepositional phrase
structures are influenced by lexical, language-specific grammatical and frequency factors.

2 PP attachment ambiguity

The PP attachment ambiguity involves the possible attachment of a PP either to the preceding VP or to the preceding NP, and can be illustrated in sentences such as:

(1) The girl hit the boy with the apple.

In verb-noun phrase-prepositional phrase (V-NP-PP) sequences such as (1), the ambiguity lies in the possibility of attaching the PP with the apple either to the preceding verb hit denoting the instrument of the action described by the verb, or to the preceding NP boy, as a modifier of the NP.

In order to explore the frequency of PP attachment in naturally produced sentences of written and spoken register and to be able to make valid claims about the role that prior exposure to comparable structures in Greek may have on parsing decisions, a corpus study was conducted. Sample sentences were extracted from two types of corpora: (i) a very large corpus which includes written texts in Modern Greek (Institute for Language and Speech Processing corpus), and (ii) a manually compiled corpus of spoken Greek. The corpus data were analysed on two levels (coarse-grained vs. fine-grained analysis). The coarse-grained analysis allowed testing the predictions of the Tuning Hypothesis (Mitchell, Cuetos, Corley & Brysbaert 1995), which posits that the parser is expected to be “tuned” only to syntactic category (coarse-grained) information during on-line sentence comprehension. Alternatively, constraint-based accounts of sentence comprehension assume that parsing preferences are reflected on corpus frequencies at more fine-grained levels of analysis (e.g. Spivey-Knowlton & Sedivy 1995), at which information such as the lexical choice of preposition and definiteness are taken into account. The results of the written and spoken corpus data analysis indicated that VP attachment is the most frequent type of attachment in Greek V-NP-PP structures and that attachment frequencies vary depending on the preposition that heads the PPs: VP attachment was more frequent than NP attachment for me, se and apo-PPs whereas the opposite pattern was found for ja-PPs.

In addition, the thesis explores native Greek speakers’ parsing preferences for temporary ambiguous PP structures by means of three psycholinguistic experiments (one off-line acceptability judgement and two on-line self-paced reading tasks). Two groups of adults and one group of 11- to 12-year old children participated in the study. All participants were native speakers of Greek.
and had never spent more than six months in a country other than Greece. The participants read sentences and made grammaticality decisions about items in which PPs were (pragmatically) forced towards either a VP attachment interpretation (2a) or an NP attachment one (2b).

(2) a. Ο κιπουρος εκοπή το κλαδι το/ενα μαξερι. (VP attachment)
   The-nom gardener-nom cut-perf.3sg the-acc branch-acc with the/a-acc
   knife-acc
   ‘The gardener cut the branch with the/a knife’

b. Ο κιπουρος εκοπή το κλαδι το/ενα λουλοδι. (NP attachment)
   The-nom gardener-nom cut-perf.3sg the-acc branch-acc with the/a-acc
   flower-acc
   ‘The gardener cut the branch with the/a flower’

The primary aim of the psycholinguistic tasks was to investigate which type of PP attachment (VP vs. NP) would be read faster or rated as more grammatical by the participants. The experimental materials included four Greek prepositions (me [with], se [in/into], apo [from/by], ja [for]) in order to examine the extent to which the lexical choice of P affects native Greek speakers’ attachment preferences. The data were also manipulated in terms of the definiteness of the NP complement of P (definite vs. indefinite) so as to examine the extent to which a language-specific grammatical phenomenon which involves the postulation of multiple determiners in instances of nominal and adjectival modification (Definiteness Agreement) extends to complex object DPs with prepositions me, se, apo and ja (see Stavrou 2003, Stavrou & Tsimpli 2009).

The results of the off-line and on-line tasks revealed a general VP attachment preference in both children and adults. The VP attachment preference was largely dependent on the lexical choice of preposition in the adult group whereas the insertion of different prepositions in the PP site affected children’s parsing decisions to a lesser extent. Although VP attachment sentences with apo-, ja- and me-PPs were initially read faster than NP attachment ones, there was no attachment preference for sentences with se-PPs. In addition, definite NP attachment sentences (to κλαδι me to λυλοδι) were read significantly faster than indefinite ones (to κλαδι me ena λυλοδ) by both children and adults in sentences with me- and se-PPs (but not with apo- and ja-PPs). These results show that Greek native speakers were strongly garden-pathed by the indefiniteness of the NP complement of P, and provide further support to the claim that Definiteness Agreement extends to complex DPs (DP+PP). The fact that this effect was only found in me- and se-PPs
indicates that the lexicality of P plays an important role in the licensing of the phenomenon (Stavrou & Tsimpli 2009). In addition, the investigation of children's online parsing preferences revealed that children at the age of 11 to 12 employ essentially the same parsing strategies as adults but are less sensitive to lexical information than adults. These results are consistent with accounts that postulate continuity of parsing strategies (see Felser, Marinis & Clahsen 2003).

3 Conclusion

This dissertation investigates the effect of frequency and the role of lexical and language specific grammatical factors on Greek native speakers’ (children and adults) processing of temporarily ambiguous PP structures. Taken together, the results of the corpus analyses and the psycholinguistic data indicate that there is a hierarchy of lexicality among prepositions me, se, apo and ja and that, although there is a degree of correspondence between frequency counts and parsing preferences (on a coarse-grained level), frequency alone cannot account for native Greek speakers’ parsing preferences.

References


