Pronoun ambiguity resolution in Greek: Evidence from monolingual adults and children

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Abstract

A large body of psycholinguistic research has revealed that during sentence interpretation adults coordinate multiple sources of information. Particularly, they draw both on linguistic properties of the message and on information from the context to constrain their interpretations. Relatively little however is known about how this *integrative* processor develops through language acquisition and about how children process language. In this study, two on-line picture verification tasks were used to examine how 1st, 2nd and 4th/5th grade monolingual Greek children resolve pronoun ambiguities during sentence interpretation and how their performance compares to that of adults on the same tasks. Specifically, we manipulated the type of subject pronoun, i.e. null or overt, and examined how this affected participants' preferences for competing antecedents, i.e. in the subject or object position. The results revealed both similarities and differences in how adults and the various child groups comprehended ambiguous pronominal forms. Particularly, although adults and children alike showed sensitivity to the distribution of overt and null subject pronouns, this did not always lead to convergent interpretation preferences.
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1. Introduction

Over the past 20 years an accumulating body of evidence on sentence processing has shown that a wide range of syntactic and non-syntactic sources of information mediates sentence interpretation. For example, semantic plausibility, syntactic information, relevant contextual information, statistical regularities, and frequency of lexical co-occurrence have all been found to inform adults' parsing commitments (Altmann and Steedman, 1988; Pearlmutter and MacDonald, 1995; Taraban and McClelland, 1988; Tanenhaus and Trueswell, 1995; Trueswell, 1996; Trueswell and Tanenhaus, 1994; Trueswell et al., 1994).

Although there is plenty of evidence that adults are capable of coordinating these types of information, it is unclear whether the same applies to children. Recent research on the nature of children's sentence processing abilities has attempted to unify theories of language processing and language development and to examine how the processing system develops in children (e.g., Clahsen and Felser, 2006; Felser et al., 2003b; Goodluck, 1990; Goodluck and Tavakolian, 1982; McKee et al., 1993; Papadopoulou and Tsimpli, 2005; Trueswell et al., 1999; Tyler and Marslen-Wilson, 1981).

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One phenomenon that requires the coordination of different types of information is pronoun resolution in null subject languages, where the choice of subject pronoun form (overt or null) is regulated by discourse factors. In this paper, we present the results of two experiments that are designed to examine how Greek children and adults coordinate grammatical and discourse pragmatic information in order to resolve pronoun ambiguities during sentence interpretation. The focus is on the resolution of overt and null subject pronouns whose distribution in Greek is regulated by discourse factors. If children have acquired the grammatical and discourse pragmatic principles of pronoun distribution, then we would expect their interpretation preferences to be the same as those of adults and to vary as a function of pronoun form. To explore this research question we employed a self-paced listening picture verification task in which we investigated both the participants' pronoun resolution preferences and processing patterns as revealed from listening times on particular words/zones of the critical stimuli. Our findings indicate that, whereas adults have an established subject preference for null pronominal forms and an object preference for overt pronouns, children show a distinct developmental pattern for null and overt pronouns. In particular, the resolution of overt pronouns is adult-like in 10-to-11-year-old children, but not steady in younger child groups, although they too seem to be sensitive to the appropriate discourse feature during sentence processing. On the other hand, null pronouns reveal a U-shaped development with no clear resolution pattern even at the age of 10-to-11 years.

In section 2, we first give a brief overview of pronominal subjects in Greek, while current accounts as well as empirical data on the interpretation of null and overt pronouns are outlined in section 3. In section 4 we review studies on the acquisition of null and overt subjects in null-subject languages. In section 5 we describe the experiments that we conducted and report on their results; first, we describe the experiment investigating null (section 5.1) and secondly the one testing overt subject pronouns (section 5.2). In section 6 we discuss the results from both experiments and their implications for current theories of language processing in children. In section 7 we draw a number of conclusions from the evidence provided.

2. Distribution of null and overt subject pronouns in Greek

Greek is a null-subject language, that is, it allows null subjects in finite clauses as shown by the example in (1):

(1)   Xtes   *pro* íδa   to   Jáni.
        yesterday   *pro* saw-PERF-1SG   the-ACC   Jani-ACC
        ''Yesterday I saw John.''

However, the repertoire of pronominal forms in Greek consists of both null and overt pronouns. The null pronominal option is a weak pronoun and is considered to be the default form, whereas the overt pronominal form is a strong pronoun and constitutes the ''marked'' option (Cardinaletti and Starke, 2001; Montalbetti, 1984). For example, the null and overt pronouns in (2a) and (2b) respectively, though ambiguous, exhibit specific preferences with respect to their reference. Namely, the null pronoun in (2a), being the default pronominal form in Greek, is preferably anchored to the most salient/ prominent referent, i.e. the sentential subject/topic, and hence leads to a non-shifted interpretation for the subject. On the other hand, the overt pronoun in (2b), when pronounced as unstressed, marks topic shift and is preferably associated with less salient/prominent entities of the discourse, i.e. non-topic referents. Notice that such a referent could be either the complement of the main clause, *tin kopéla*, or a third referent not mentioned in the main clause[1]:

(2a)   O   papús   milúse   δinatá   ston   egonó   tu   ótan   pro   δjávaze   éna   vivlío.
        the   old-man   spoke-IMP-3SG   loudly   to-the   grandson his   when   pro   read-PAST-IMP-3SG   a   book
        ''The old-man was speaking loudly to his grandson when he was reading a book.''
(2b)   I   jajá   xerétise   tin   kopéla   ótan   aftí   pernúse   to   δrómo.
        the   old-lady   greeted-PERF-3SG   the   girl   when   she   crossed-IMP-3SG   the   street
        ''The old-lady greeted the girl when SHE was crossing the street.''

Consider further the interpretation of null and overt subject pronouns in (3). The null pronoun in (3b) is straightforwardly anchored to the topic of the previous utterance, *o Pétros*, introduced in (3a). Notice, however, that the use of an unstressed overt pronoun in (3c) to refer to the previous topic makes the sentence sound awkward. However, (3c) becomes easily acceptable and acquires additional readings, if the overt pronoun is stressed as in (3d). Namely, the presence of a stressed overt pronoun with a high pitch accent associated with contrastive focus in (3d) implies that Peter

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[1] The third referent option is indeed highly marked, as an anonymous reviewer mentions, and requires contextual (discourse or visual) supporting cues. In our experimental tasks we included pictures with a third referent as a possible antecedent.