

Comprehension of wh-questions and declarative sentences in agrammatic aphasia: The set partition hypothesis

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Abstract

Problematic trace-antecedent relations between deep and surface structure have been a dominant theme in sentence comprehension in agrammatism. We challenge this view and propose that the comprehension in agrammatism in declarative sentences and wh-questions stems from impaired processing in logical form. We present new data from wh-questions and declarative sentences and advance a new hypothesis which we call the set partition hypothesis. We argue that elements that signal set partition operations influence sentence comprehension while trace-antecedent relations remain intact.

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1. Introduction

Agrammatic aphasia is an interesting and controversial condition. Its hallmarks are the fragmented and often ungrammatical sentences and difficulties understanding complex declarative sentences (Burchert, De Bleser, & Sonntag, 2003; Dickey & Thompson, 2004; Grodzinsky, 2000). In this paper we focus solely on the comprehension deficit. We start with a broad overview which serves as a background to our study. It has repeatedly been shown that reversible declarative sentences with canonical thematic role order

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(actives, subject clefts and relatives) are understood better than non-canonical declarative sentences (passives, object clefts and relatives; Bastiaanse & Edwards, 2004; Edwards, 2005; Grodzinsky, 2000; Lee & Thompson, 2004). Nonetheless, non-reversible declarative sentences are understood well despite order of thematic roles (Ansell & Flowers, 1982; Brookshire & Nicholas, 1980; Caramazza & Zurif, 1976). The frequently reported pattern of comprehension differences between canonical and non-canonical reversible sentences is sometimes referred to as the “standard” profile of agrammatic comprehension (Grodzinsky, 1998, p. 179). Other less studied phenomena include comprehension of sentences with psychological predicates (Balogh & Grodzinsky, 1996; Nickels, Byng, & Black, 1991; Piñango, 2000, 2006), sentences with prepositions (Kolk & Friederici, 1985; O’ Grady & Lee, 2005), aspectual and complement coercion (Piñango & Zurif, 2001), sentences with dative alternations (Piñango, 2006), sentences with quantifiers (Balogh & Grodzinsky, 2000; Saddy, 1995) and wh-questions that begin with *who*, *what* and *which*, the focus of this paper.

In comparison with declarative sentences little is known about comprehension of wh-questions in aphasia, Gallagher and Guilford (1977) and Riley (1988) highlighted deficits in understanding wh-questions in aphasia. More recently, comprehension of wh-questions with canonical and non-canonical thematic role order has attracted attention in agrammatism (Hickok & Avrutin, 1996; Neuhaus & Penke, *in press*; Thompson, Tait, Ballard, & Fix, 1999; Van der Meulen, Bastiaanse, & Rooryck, 2002). The wh-questions under study are syntactically similar to canonical and non-canonical declarative sentences in that the order of thematic roles is a shared characteristic. In canonical sentences (declarative sentences and wh-questions alike) the order of thematic roles is *agent–patient* whereas in non-canonical the order of thematic roles is *patient–agent*. So, these sentences are ideal to test theoretical accounts in order to gain a more detailed insight into the underlying nature of aphasia and the architecture of the grammatical system.

In this paper our aims are: To critically evaluate claims about comprehension of wh-questions in agrammatism; to present new data from five agrammatic speakers on different types of wh-questions; to explore, for the first time, the influence of raising and sentence length on wh-questions; to consider a range of possible explanations for our and other published data. Finally, we advance a new explanatory hypothesis about the comprehension deficit of declarative sentences and wh-questions in agrammatism. We are calling this the set partition hypothesis.

1.1. *Accounts of agrammatic comprehension*

The aphasia field is crowded with competing accounts of agrammatic comprehension. These can be divided broadly into two main categories which reflect key theoretical orientations and debates. First, the government and binding framework (Chomsky, 1981, 1986; Haegeman, 1994) has motivated the trace deletion hypothesis (Grodzinsky, 1986, 2000) which explains the agrammatic comprehension deficit in terms of problematic trace-antecedent representations. Second, reduction in processing capacity has been interpreted in a number of ways. These include:

- i. An inability to map thematic roles onto sentence constituents (Linebarger, 1995; O’ Grady & Lee, 2005; Saffran & Schwartz, 1988).

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