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ON THE WORD ORDER CONTROVERSY AND SYNTACTIC SIMPLIFICATION IN EXPRESSIVE AGRAMMATISM: EVIDENCE OF SELECTIVE IMPAIRMENT IN OBJECT CLITIC TRANSFORMATION, OBJECT MOVEMENT, AND BOTH

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Abstract. After being the most studied aphasia for more than a century, researchers have identified only two core features of agrammatic aphasia at the sentence level. The study aims to tackle the current controversy of whether word order difficulties can be a peripheral characterizing feature of agrammatic aphasia. We investigate the production of five Spanish brain damaged participants focusing on a set of four sentence conditions that, to the best of our knowledge, can only be tested in Russian or Spanish. The results show that it is difficult for agrammatic speakers to move the object whether it is a clitic or a full NP.

Keywords: clitic pronoun, agrammatism, DOP-H hypothesis, Spanish, Russian

Introduction

Defining agrammatism has been a challenge given the variety of deficits characterized as symptoms (Caramazza & Berndt, 1985; Menn & Opler, 1990). At the sentence level it has been demonstrated that both simplification of syntactic structures and difficulties with functional elements are core features of agrammatic aphasia. However, for modern aphasiologists there are other debated features that could be defining characteristics, namely, reduced sentence length, and “one of the most controversially discussed issues from classical aphasiology until now”: word order difficulties (De Bleser, Burchert, Holzinger & Weidlich, 2012). In agrammatic aphasia, production of clitics has been shown to be affected either by analyzing spontaneous speech (Nespoulous et al., 1988; Reznik et al., 1995; Stavrakaki and Kouvava, 2003; Chinellato, 2004; Rossi, 2007) or by testing clitic production in an experimental setting (Rossi, 2007; Gavarró, 2008, Nerantzini, 2008; Martínez-Ferreiro, 2010, Reyes & Bastiaanse, 2013). Clitics are a special type of personal pronouns that exhibit a number of specific syntactic properties, but that ‘lean’/are dependent on adjacent words. To characterize clitics it is useful to distinguish them from nouns (full NPs) and strong pronouns. According to Rossi, 2007, the characteristic which differentiates clitics from nouns and

strong pronouns are their inability to (a) bear contrastive stress, and (b) occupy the full NPs and strong pronouns' position in the clause:

Nouns (Full NPs)	Strong pronouns	Clitic pronouns
<i>Sam juega tenis no <u>futbol</u></i>	<i>Sam me ha invitado a <u>mi</u> no a ti</i>	<i>Sam <u>me</u> ha invitado no te ha invitado*</i>
(a) Sam plays tennis not <u>soccer</u>	Sam has invited <u>me</u> not you	Sam <u>me</u> has invited not you*
<i>Sam lee la revista</i>	<i>Sam saluda a Carlos y a Luis/todos</i>	<i>Sam saluda los*</i>
(b) Sam reads the magazine	Sam greets Carlos and Luis/everyone	Sam greets 'them'*

Interestingly, clitics in agrammatism have only been explored in Greek, Italian, French and Ibero-Romance (Spanish, Catalan and Galician). In Spanish, Reznik focused on the clitic production in aphasic spontaneous speech, while experimentally, Reyes & Bastiaanse tested clitic production and Martínez-Ferreiro also tested comprehension. This study focuses on the morpho-syntactic problems of Spanish agrammatic speakers with emphasis on (a) the production of sentence word order, adding evidence to the specific discussion of whether it is an agrammatic peripheral feature or not, and (b) looking further into the first core feature by testing postverbal syntactic complexity. Given the particular flexible word order in which Spanish can be grammatically produced and the predictions that can be made from the 'Derived Order Problem Hypothesis' (DOP-H) (Bastiaanse & van Zonneveld, 2005), the present study focuses on two movement operations, clitic and object scrambling in a way that, to our knowledge, can only be explored in Russian and Spanish. We hypothesize that syntactic complexity, in a linguistic sense, is a critical factor in agrammatic production, and predict that sentences with object movement and clitic movement will be more difficult than sentences with basic word order (SVO), regardless of the position in the syntactic tree.

Method

Participants	Age	Time Post-Onset (years)	Etiology	City
A1	34	8	Hematoma due to diffuse vasculitis	Barcelona
A2	59	3	CVA	Barcelona
A3	53	18	CVA	Barcelona
A4	68	5	CVA	Barcelona
A5	64	10	CVA	Barcelona

Stimuli

A set of 64 semantically reversible target sentences with transitive verbs and animate subjects and objects were used, the first 16 employed in the development of the Verb and Sentence Test (VAST) by Bastiaanse, Edwards and Rispens (2002), and another 48 sentences derived from them. The set included four target sentence types: (a) active declarative sentences with a transitive (finite) lexical verb, that is assumed to stay in its base-generated position in English and Spanish (the “full object in base position” condition; e.g., “The man kisses the woman - El hombre besa a la mujer”) (n = 16); (b) active declarative sentences with a clitic pronoun, assumed to move from post-verbal to preverbal position (e.g., “The man la kisses - El hombre la besa”) (n = 16); (c) active declarative sentences with a finite lexical verb in which the full object moves to preverbal position (e.g., “The man to the woman kisses - El hombre a la mujer besa”) (n = 16); and (d) imperative sentences with a clitic pronoun in the postverbal position (e.g., “Man kissesla - Hombre bésala”) (n = 16). This being said, a simpler way to characterize the sentences is: (a) –mov –clitic, (b) +mov +clitic, (c) +mov –clitic, (d) –mov +clitic. In all the sentences the subject and object differed in gender to avoid

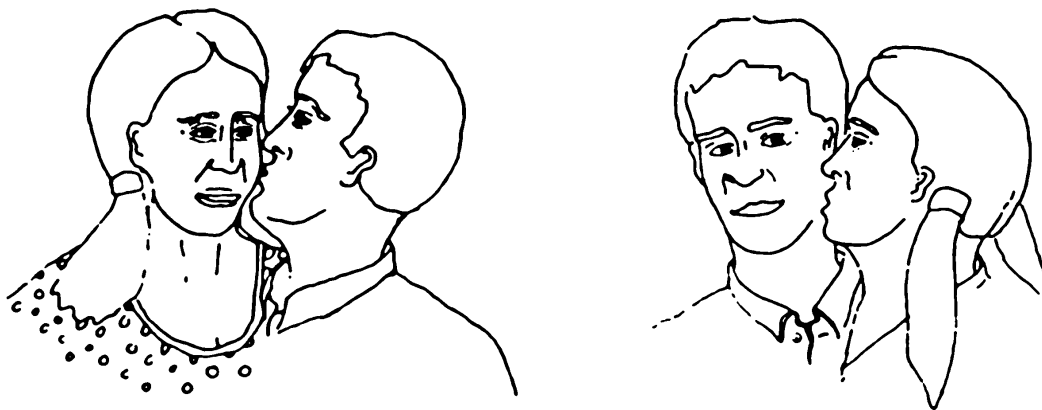


Figure 1. Taken from Bastiaanse et al. (2002), with permission.

correct answers in the second (clitic) condition due to repetition, as in Spanish the use of third person singular clitics depends on the gender they refer to (lo-la refer to male or female respectively). For testing each sentence or item, black-and-white picture pairs developed by Bastiaanse et al. (2002) were used: the first picture in the pair depicts the target sentence and the other depicts its semantically reversed counterpart, so the two types of clitics (lo, la) were tested equally as half of the items have a male subject performing the action in the second part of the phrases. A set of 64 picture pairs (16 original pairs and 3 copies of each) was used to elicit the three sentence conditions mentioned above. Therefore, the 16 original picture pairs can elicit the 64 types of target sentences. The picture on the right always depicted the first

sentence, and the picture on the left depicted the sentence which participants had to complete. Items were pseudo-randomly assigned (each picture occurred only once in the first 16 items, once in the second 16 items, etc.) but the order was the same for each participant.

Procedure

Using each pair, the 4 sentence conditions were elicited using a sentence production priming task in the following way: the experimenter pointed to the first picture of the pair reading aloud the prompt sentence, after which the experimenter pointed to the second one, reading only the subject of the sentence aloud. The participant was expected to complete the sentence depicted in the second picture using the same sentence structure the examiner used before (e.g., the examiner said: “Here the man kisses the woman, and here the woman...”, and according to the 4 sentence conditions, the participant responded: (a) “kisses the man”, (b) “lo (male Spanish clitic) kisses”, (c) “to the man kisses”), or (d) “bésalo”. The experiment was carried out in a quiet room. The participant sat in front of a computer screen and the experimenter sat next to him/her, and the experimental procedure was explained to the participant. There were three trial sentences (the last trial were be different from the first experimental sentence type). In case the task was not clear, any questions were allowed and additional trial sentences were added until the participant understood the task. All responses were transcribed for analysis.

Results

Correct sentence production per brain-damaged participant. Row percentages:

Condition	n	A1	A2	A3	A4	A5
(a) –mov –clitic	32	100	96.875	100	84.375	93.75
(b) +mov +clitic	32	15.625	6.25	100	0	0
(c) +mov –clitic	32	0	0	0	0	0
(d) –mov +clitic	32	59.375	3.125	46.875	0	0

The first sentence condition was easier to produce than the other three ($p < .0001$ Fisher's exact test at both overall and at the individual level, except among conditions (a) and (b) in the participant A2).

Discussion

The present study was carried out with the idea to test specific grammatical features to add evidence to the controversial question of whether word order

difficulties can be characterizing features of agrammatic aphasia. Using syntactic structures that can only be tested in Russian and Spanish to the best of our knowledge, partly due to the free word order that is allowed in these languages, the predictions that can be made from the DOP-H account for the results in the sense that the results support the hypothesis that it is difficult for agrammatic speakers to move the object whether it is a clitic or a full NP. It is also shown that movement and clitics can be affected selectively, which also give lights to the study of clitics in brain damaged individuals. In sum, this study favors the characterization of word order difficulties as an agrammatic peripheral feature.

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Трудности с порядком слов и синтаксическое упрощение при аграмматизме в порождении речи: данные об избирательном нарушении трансформации дополнений-клитик или передвижения дополнений, или и того и другого

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Аннотация. Несмотря на то, что аграмматизм в афазии является наиболее изучаемой темой вот уже больше века, ученым удалось выделить только два основных признака аграмматической афазии на уровне предложения. Цель данного исследования — выявить, являются ли трудности, связанные с порядком слов в предложении, периферическим характеризующим признаком аграмматической афазии или нет. Мы изучили речь пяти испаноговорящих пациентов с повреждениями головного мозга на предмет использования четырех типов конструкций, которые являются грамматически приемлемыми конструкциями в испанском и русском языках. Показано, что пациенты, страдающие аграмматизмом, испытывают трудности с передвижением дополнения независимо от того, является ли оно клитикой или частью именной группы.

Ключевые слова: местоимения-клитики, аграмматизм, гипотеза DOP-Н, испанский, русский