A novel argument for the Universality of Parsing principles

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ABSTRACT

Previous work on Relative Clause attachment has overlooked a crucial grammatical distinction across both the languages and structures tested: the selective availability of Pseudo Relatives. We reconsider the literature in light of this observation and argue that, all else being equal, local attachment is found with genuine Relative Clauses and that non-local attachment emerges when their surface identical imposters, Pseudo Relatives, are available. Hence, apparent cross-linguistic variation in parsing preferences is reducible to grammatical factors. The results from two novel experiments in Italian are presented in support of these conclusions.

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1. Introduction

In this paper we identify a confounding factor in the literature on Relative Clause (RC) attachment preferences originating with the findings of Cuetos and Mitchell (1988): the asymmetric availability of Pseudo Relative Small Clauses (PRs).

Analyzing previous attachment preference results both crosslinguistically and cross-structurally, we observe the following: everything else being equal (controlling prosody, referentiality, etc.) languages/structures that generate a Low Attachment preference contain genuine Relative Clauses (RCs), while those demonstrating a High Attachment preference have a string identical, but structurally

and interpretatively distinct, representation from the RC, the PR (1).

(1) a. Vi al [$_{DP}$ [$_{NP1}$ hijo del medico] [$_{CP}$ que corría]]. RC, HA

b. Vi al [$_{DP}$ hijo [del [medico [$_{CP}$ que corría]]]]. RC, LA
Saw.I the son of.the doctor that run.impf.
'I saw the son of the doctor that was running.'

c. Vi al [$_{SC}$ [$_{DP}$ hijo$_1$ del medico$_2$] [$_{CP}$ que EC$_{1/*2}$ corría]]. PR, obligatory HA
Saw.I the son of.the doctor that run.impf.
'I saw the son of the doctor running.'

RCs are NP-modifiers and denote properties of entities, PRs are either complement or adjuncts of VPs and denote events/situations. In the context of complex NPs, the most local NP is not grammatically available for attachment in the case of a PR interpretation, High Attachment is

mandatory. Critically, PRs are not crosslinguistically available: they exist in Spanish (French, Italian, Dutch among others) but not in English (Romanian, Basque, Chinese, among others). Thus, in Spanish there are certain contexts (clarified below) where an RC is open to at least one additional interpretation/structural parse that is unavailable in English. Furthermore, within a language (e.g., Spanish), PRs are not available in all syntactic and semantic environments, as they are selected by a relatively small set of predicates and subject to a number of syntactic and semantic constraints.

We propose an account, the *PR-first Hypothesis*, based on the structural and interpretive distinction between PRs and RCs, to explain (some of the) variability in the attachment preference literature. We then present a test of this Hypothesis across two studies in Italian through the manipulation of PR availability. The results of both experiments strongly support the predictions of the PR-first Hypothesis: a Low Attachment preference is observed in all conditions in which RC is the only available reading, while a significantly greater preference for High Attachment is observed when PRs are a grammatical option.

The conclusion we will draw is that locality is a universal principle governing the human language parser and the apparent exceptions can be reduced to the variation in PR-availability across languages and structures. This does not mean to say that locality does not interact with other principles when it comes to RC attachment. As, e.g. Gilboy, Sopena, Clifton, and Frazier (1995) show convincingly, *Referentiality* plays a major role in deciding RC attachment; the same is true of prosody (Fodor, 2002a). Importantly these interactions between principles of locality and referentiality/prosody (among others) generate the same outcome in all languages studied. What we set out to explain here is the residual asymmetry in attachment across both languages and structures that is left unexplained. We claim that when PR-availability is considered, much of this variation can receive a principled explanation that does not require postulating language specific parsing mechanisms.

The structure of the paper is the following: Section 1.1 introduces the relevant literature on variation in RC attachment across languages, structures and individual processing capacity. The ambiguity between Pseudo Relative Small Clauses (PR) and RCs is introduced in Section 2. After having presented some core properties distinguishing PRs from genuine RCs (Section 2.1), we will propose that the parser is more likely to resolve this ambiguity in favor of Pseudo Relatives over Relative Clauses, as the former are simpler on both structural and interpretive grounds 3.1. Sections 3.2 and 3.3 discuss the application of this distinction to previously observed attachment preference asymmetries across languages and structures respectively. Section 4 presents the results of two novel experiments on attachment preferences in Italian in which we manipulated PR availability. Section 5 sums up the findings and concludes with a research agenda to further investigate the role of PRs in attachment.

1.1. Asymmetries in attachment preferences

Principles of locality have been shown to regulate both structure building and filler-gap processes in language processing (*Right Association* Kimball, 1973; *Late Closure* Frazier, 1978; *Minimal Attachment* Frazier, 1978; Frazier & Fodor, 1978; *Minimal Chain Principle* De Vincenzi, 1991; *Recency* Gibson, 1991; *Merge Right* Phillips, 1996, among others).[1]

(2) details a typical case of ambiguity in which such principles have been shown to apply:

(2)   John said that Bill arrived yesterday

    a.   John [$_{VP}$ said [$_{CP}$ that [$_{IP}$ Bill [$_{VP}$ <u>arrived yesterday</u>]]]]

    b.   John [$_{VP}$ <u>said</u> [$_{CP}$ that [$_{IP}$ Bill [$_{VP}$ arrived]]] <u>yesterday</u>]

Principles of Locality, correctly predict (2-a), i.e. with the temporal modifier *yesterday* attaching to the most local potential host, to be the preferred interpretation.

Yet, this picture is not exempt from problems: Cuetos and Mitchell (1988) tested both English and Spanish speakers for their attachment preferences when RCs were embedded within complex NPs (3). They found that while English speakers had a preference for Low Attachment (LA), i.e. appear to obey locality principles akin to Late Closure (3-a), Spanish speakers preferred High Attachment (HA), apparently disobeying locality (3-b).

(3)   a.   Someone shot the maid$_1$ of the <u>actress$_2$</u> that$_2$ <u>was$_2$</u> standing on the balcony

    b.   Alguien disparó contra la <u>criada$_1$</u> de la actriz$_2$ que$_1$ <u>estaba$_1$</u> en el balcón

These findings are at odds with the otherwise uniform Local Attachment preferences found for other structures within that same language (Phillips & Gibson, 1997) This has led researchers to question the universality of locality principles in processing and, as a consequence, of the very existence of universal principles of parsing, grounded on syntactic structures or otherwise. This, in turn, posed important theoretical problems for language acquisition.[2]

The second issue is in many respects far more critical than the first: How to account for cross-linguistic variation in parsing preferences. While variation across structure can have a principled explanation, cross-linguistic variation in parsing preferences is much harder to capture under a principled account. For these reasons, the last two decades generated a large body of work aimed at explaining these problematic findings for parsing. These studies confirmed that speakers of additional languages differ in their RC attachment preference in complex DP

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[1] While it is a matter of debate whether these, and other, principles of syntactic parsing apply in isolation from, and prior to, other factors involved in deciding the meaning of a sentence, e.g. context, plausibility, lexical idiosyncrasy (see e.g. Altmann, van Nice, Garnham, & Henstra (1998) on the effects of contexts in late closure), there is substantial consensus that principles of locality play a major role in human language parsing.

[2] As Fodor (1998a)p. 285 puts it: *The whole explanatory project [...based on the hypothesis that the processing mechanism is fully innate and applies differently to different languages only to the extent that their grammars differ ...] is in peril because of the discovery that Late Closure is not universal.*