

Effects of structural prominence on anaphora: The case of relative clauses

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Abstract

In this paper we present a corpus study and a sentence completion experiment de-signed to evaluate the discourse prominence of entities evoked in relative clauses. The corpus study shows a preference for referring expressions after a sentence final relative clause to select a matrix clause entity as their antecedents. In the sentence completion experiment, we evaluated the potential effect of head type (restrictive relative clauses are contrasted with non-restrictives and restrictives with an indefi-nite head). The experimental data show that the matrix clause subject referent is strongly preferred as an antecedent, thus strengthening the conclusion that entities evoked in relative clauses are less salient than their main clause counterparts. Some remaining issues are discussed.

Introduction

With the exception of a limited set of pronouns which are interpreted according to grammatical rules (e.g., Reinhart 1997), referential pronouns refer to contextually salient antecedents. Prior work on the relationship between discourse salience and the choice of referring expression has evaluated several factors. Most notably, structural focusing accounts such as Centering, a model of local coherence in discourse, argue that pronouns select antecedents which are highly accessible with discourse topics being the most prominent of all (Ariel 1990, Grosz et al 1995). At least for English, subjects rank high on salience. Semantic and pragmatic focusing accounts have examined the effect of thematic roles and the semantics of connectives in determining entity salience. Stevenson et al (2000), for example, argue that the focusing properties of action verbs make ‘patients’ more salient than ‘agents’ independently of grammatical role.

Note that most of the related work in this area has examined sequences of simple sentences. The aim of the present study is to advance our understanding of the factors determining the salience status of individual entities in discourse by examining entities in complex sentences. Specifically, we designed a corpus study and a sentence completion task to compare the salience status of entities evoked in main and relative clauses.

Previous work on Relative Clauses

The syntax and semantics of relative clauses have been the subject of a huge literature (e.g., McCawley (1981)). To-date the debate is still on regarding the appropriate syntactic analysis of relative clauses.

Relative clauses with resumptive pronouns have also been the source of several syntactic puzzles. Prince (1990) investigated the discourse functions of relative clauses containing a resumptive pronoun in English and Yiddish. Based on a corpus of naturally occurring relative clauses with resumptive pronouns, she argues that there is a set of data which cannot be explained based on previous accounts. Specifically, she finds that, for these data, resumptive pronouns are licensed in the case of non-restrictive and restrictive relative clauses with an indefinite head but not in the case of restrictives with a definite head. She argues that this phenomenon can be explained with Heim's file card metaphor. Resumptive pronouns are licensed when an entity has already been evoked in the discourse and is therefore available for pronominal reference.

Fox and Thompson (1990) avoided the distinction between restrictive and non-restrictive relative clauses. In their corpus analysis, they looked at discourse properties of relative clauses and argued that the attested discourse functions of relative clauses accounts for the grammatical properties of relative clauses.

Note that no claims have been made yet regarding the discourse salience of the entities evoked in relative clauses. Miltsakaki (2005) compared the salience of entities in main and relative clauses of the English and Greek language. Based on a centering analysis of the data, she concludes that in contrast with main clause subjects, subjects of relative clauses do not always warrant pronominal reference.

The Corpus Study

The dataset of our corpus study was constructed from a corpus of ten literary works available from the Project Gutenberg Literary Archive. We extracted 100 tokens of relative clauses according to the following criteria: a) the relative clause was in a sentence final-position, b) at least two animate entities were evoked in the main clause, and c) the sentence following the relative clause included reference to at least one entity evoked in the sentence containing the relative clause—either in the main or in the relative clause. For each token, we annotated the grammatical role of the relativised entity in the main clause, the relativised entity in the relative clause and the type of referring expression in the following clause.

The analysis of our data reveals the following patterns of reference. In 64% the antecedent was evoked in the matrix clause only, shown in (1) and (2). In an additional 31%, the antecedent was evoked in both clauses, and only in 5% the antecedent was evoked exclusively in the relative clause, shown in (3).

- (1) Has no letter been left here for me since we went out? said **she** to the footman who then entered with the parcels. **She** was answered in the negative.
- (2) Then **Huck** told his entire adventure in confidence to Tom, who had only heard of the Welshman's part of it before. "Well," said **Huck**...
- (3) The Queen used to ask me about the English noble who was always quarrelling with **the cabmen** about their fares. **They** made...

With respect to the 64% of our tokens in which the antecedent was evoked in the main clause only, in the 75% of cases, the antecedent of the referring expression was evoked in the subject position of the main clause and 9% the antecedent was evoked in the object position of the main clause. As for the grammatical role of the relativised entity in the relative clause itself, in the 85% of our tokens it was the subject of the relative clause, in the 8% the object, whereas in the 7% a PP complement.

The experiment

In this study, we tested the potential effect of the information status of the entity evoked in the head noun of the relative clause (see discussion of Prince (1990) in Section 2). To test the hypothesis that non-restrictives and restrictives with an indefinite head pattern alike and are processed as autonomous discourse units on a par with main clauses, we designed a sentence completion study with three conditions, sampled below:

1. Non-restrictive, Head=Proper noun (PN)

Samantha met Jennifer who played in Friends. She...

2. Restrictive, Head=Indefinite noun (IN)

Matthew adopted a boy who lost his family in civil war. He...

3. Restrictive, Head=Definite noun (DN)

The professor collaborated with the guy who was hired last month. He...

A total of 15 native speakers of English were asked to write a natural continuation for 12 critical items each (and 36 fillers). We counted how many times the ambiguous pronoun was interpreted as the main clause subject. An ANOVA analysis of the results did not show any significant effect of the head type, as in the majority of the data the pronoun was interpreted as the main clause subject (76% with PN head, 73% with IN head and 81% with a DN head). So, in the absence of a larger context, main clause subjects appear to be more salient than relative clause subjects, but looking closer at the data we see that IN restrictives pattern more closely with PN non-restrictives.

Conclusions

The results of both the corpus and the sentence completion study reveal that main clause referents make better antecedents for subsequent referring expressions, including pronouns. It is therefore clear that discourse salience is sensitive to structural prominence, i.e., main clause entities are more salient than relative clause entities. However, scrutinizing the data we observe that in some cases other discourse factors might be interacting with structural prominence. In the sentence completion study, we saw some variation in the three conditions which is not significant but gives some hints for further study. Also, when we look closer at the 31% of cases in the corpus study in which the antecedent of the referring expression was present in both the main and the relative clause, we observe that in most of these cases the antecedent was the object of the main clause and the subject of the relative clause, shown in (5).

(5) she carried me to **the king**, who was then retired to his cabinet. **His majesty**, a prince of much gravity and austere countenance, not well observing my shape at first view, asked the queen,...

Further study is clearly required to understand what the conditions are under which the otherwise strong effect of structural prominence is overridden. We suspect that a promising avenue of research would take into account the effects of the hierarchical organization of the discourse.

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