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### Logophors: Looking Outside of Syntax

I present evidence for the extra-syntactic nature of logophoric reflexives in English, based on sentence processing experimentation. To this end, I investigate the distinction between reflexive pronouns that require only syntactic information to select their antecedent, and reflexive pronouns that require additional non-syntactic processes in order to establish their proper antecedent (i.e. logophoric reflexives). My research shows that these two types of reflexives are processed differently during sentence comprehension in real time, which directly supports the notion that, representationally, they obey different syntactic constraints.

To better understand the contrast between logophors and non-logophoric reflexives, consider the following examples respectively:

- (1) The therapist rolled a ball around himself.
- (2) The driver blamed himself.

In (2), the anaphor *himself* selects *the driver* as its antecedent in accordance with Principle A of the standard Binding Theory. In contrast to this, the antecedent of *himself* in (1) is outside the anaphor binding domain (i.e. the PP) and thus violates Principle A, in spite of the fact that (1) is a grammatical sentence of English. How is this explained? One representational description of logophoric reflexives comes from Reinhart & Reuland (1991; 1993) Reflexivity theory which claims that logophors (such as (1)) differ from other anaphora (2) in that they rely on more than mere syntactic binding (see also Clements 1975).

That is, logophoric reflexives cannot be interpreted simply by applying the purely syntactically defined Principle A of Chomsky (1986) Binding Theory; rather they require a non-syntactic level of interpretation. This level of interpretation might be discourse-related, as Reinhart & Reuland observe (1993:689). Along the same lines, Sell (1987) introduces the level of discourse representation as a level at which certain discourse functions are accessed, specifically the *Source*, the *Self* and the *Pivot*. The antecedent of a logophoric reflexive is conceived as the intentional agent or source of a report, or the person whose state of mind and attitude is discussed and whose point of view determines the interpretation of the anaphor. In sentence (1) above, the reflexive is thus interpreted as a logophor with respect to the antecedent's spatial and temporal location (Sells 1987:457). This information is not provided by syntax, but must be accessed outside of syntax, in the discourse.

However, there are accounts that attempt to explain logophoricity on syntactic grounds alone, for instance by extending the standard Binding Theory (e.g., Hestvik 1991). The availability of two opposing analyses of the same phenomenon opens the door for psycholinguistic evidence to establish support for one or the other.

Comparative studies of the processing demands of syntactic and non-syntactically based phenomena have received attention in the psycholinguistic literature. In particular, evidence shows that there is indeed a difference between syntactic and extra-syntactic operations (Avrutin 1999, de Vincenzi 1991, Piango, Zurif and Jackendoff 1999, et al.). Non-syntactic information places demands on the processor that go beyond those exerted by syntactically based operations.

Here, I put these two ideas together, on the one hand, that the interpretation of logophors may be non-syntactic, and on the other, that non-syntactic operations pose a higher burden on the language processor, and present the results of the experiment that investigates them. My hypothesis is that if logophors relate

to non-syntactic information (in addition to observing syntactic requirements), while anaphors as in (2) do not, a contrast between sentences such as (1) and (2) should be perceived in sentence comprehension data.

A study was conducted that investigates this hypothesis. Twenty-four native speakers of English were presented with sentences containing logophoric reflexives (such as (1)) as well as sentences containing fully syntactically motivated anaphora (such as (2)). A cross-modal lexical decision interference paradigm was applied to measure the amount of processing resources required by a native speaker in determining the antecedent for the two distinct anaphora. In this paradigm, the subjects were presented auditorily with the material and were asked to listen carefully and understand each sentence. At a certain point during the presentation of a given sentence (i.e. immediately after hearing the reflexive), a letter string appeared on a monitor in front of the subjects, upon which they had to decide (i.e., make a lexical decision) whether or not the letter string represented a word of English. Subjects indicated their decision by pressing a QesO button. Since the two tasks (understanding a sentence and performing a lexical decision) compete for the same processing resources, reaction time (RT) to the lexical decision task represents the crucial indicator for the processing resources required during sentence comprehension. Under the hypothesis that logophoric reflexives involve non-syntactic operations and therefore call for a higher processing effort in the task of listening to and understanding the sentence, processing logophors should reduce the amount of resources available for the secondary lexical decision task. A larger RT is then taken as an indication that a more complex operation is performed and that additional linguistic levels are accessed during the establishment of the antecedent.

The results show a higher RT for logophors over non-logophors (Mean  $RT_{\text{logophors}}=704.07$ ; Mean  $RT_{\text{non-logophors}}=680.06$ ;  $t(24)=1.7138$ ,  $p<.015$ ). This difference suggests that the interpretation of logophors poses a higher burden on the processor. Such a burden is in turn compatible with the view that the interpretation of logophors requires accessing non-syntactic information. It is this extra process which is measured in the higher RT. For a logophoric reflexive to determine its antecedent, more (i.e. extra-syntactic) information needs to be retrieved than for a non-logophoric reflexive. While in the latter case, syntactic information alone is sufficient for the establishment of the relationship between anaphor and antecedent, the data show that logophors require information beyond syntax.

The study presented here furthers our understanding of anaphora by showing that logophors must be distinguished from reflexives not only representationally but also in terms of their processing demands. This evidence thus supports the notion that logophors must receive their reference outside of syntax, a claim that is consistent with discourse-based proposals such as Reinhart & Reuland (2002) and Sell (2002).

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