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Newness, givenness and discourse updating: Evidence from eye movements

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ABSTRACT

Three experiments examined the effect of contextual givenness on eye movements in reading, following Schwarzschild's (1999) analysis of givenness and focus-marking in which relations among entities as well as the entities themselves can be given. In each study, a context question was followed by an answer in which a critical word was either given, new, or contrastively (correctively) focused. Target words were read faster when the critical word provided given information than when it provided new information, and faster when it provided new information than when it corrected prior information. Repetition of target words was controlled in two ways: by mentioning a non-given target word in the context in a relation other than that in which it occurred as a target, and by using a synonym or subordinate of a given target to refer to it in the context question. Verbatim repetition was not responsible for the observed effects of givenness and contrastiveness. Besides clarifying previous inconsistent results of the effects of focus and givenness on reading speed, these results indicate that reading speed can be influenced essentially immediately by a reader's discourse representation, and that the extent of the influence is graded, with corrections to a representation having a larger effect than simple additions

Introduction

The most informative parts of a sentence receive 'focus,' which can be signaled by prosody or by syntax or both. In English (and in many other languages), focus influences rhythm, stress and intonation (Beaver & Brady, 2008; Büring, 2012; Selkirk, 1984, 1995). In spoken English, focused words in (1a) and (1b), marked by the F subscript, must receive pitch accents to be felicitous. English focus can also be signaled syntactically, e.g., by clefting, as in (1c) or by focus particles like *only* (1d). Phrases syntactically marked as focused also receive pitch accents in English.

(1) a. Who talked to Mary? $[John]_F$ talked to Mary.
b. Did John or Bill talk to Mary? $[John]_F$ talked to Mary.
c. It was $[John]_F$ that talked to Mary.
d. Only $[John]_F$ talked to Mary.

Focus has semantic and pragmatic consequences, including the fact that focus evokes alternatives (Rooth, 1992). The meaning of a question (as in (1a) and (1b)) is generally analyzed as the set of alternative (possibly true) answers (Karttunen, 1977); the existence of these alternatives licenses focus marking in the answer. Similarly, the focused words in (1c) and (1d) presuppose the existence of possible (if not actual) alternatives.

The psycholinguistic literature has addressed focus in various ways. Most salient for the present work is the question of whether focused material is processed and comprehended more quickly or more slowly than non-focused material. As we review below, the literature contains inconsistent answers to this question, very likely because 'focus' has been defined and manipulated in inconsistent ways.

Focus is one (or more) of a collection of concepts used to analyze 'information structure' (Büring, 2007; Roberts, 1996/2012; Vallduvi, 1992). These concepts include the contrasts between background and focus, given and new, theme and rheme, and topic and comment. We submit that

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the variety of contrasts that the term 'focus' covers may engage a variety of distinct psychological mechanisms, and that as a result the literature contains inconsistent claims about how focus affects language processing. We first review a selection of this literature, illustrating the different effects that different 'flavors' of focus seem to have, and then propose a resolution based on a widely-cited semantic analysis of one of the core concepts covered by focus, the given/new distinction (Schwarzschild, 1999).

One way that focus has been manipulated in the psycholinguistic literature is to treat the answer to a wh-question as focused (as in (1a), above). Early research (e.g., Cutler & Fodor, 1979) showed that words that answered a wh-question received more attention, as reflected in faster times to detect a phoneme in a sentence. A similar conclusion was supported by Ward and Sturt (2007), who found that changes made to a word between readings of a passage were detected more frequently when the word answered a wh-question, and by Blutner and Sommer (1988), who found enhanced priming of the multiple meanings of an ambiguous word that answered a wh-question. Other ways of manipulating focus have also led to the conclusion that extra attention is paid to focused material. Birch and Garnsey (1995) showed that using clefting to place a word in focus led to enhanced memory for the word form, and McKoon, Ward, Ratcliff, and Sproat (1993) used various manipulations of syntactic prominence (some of which could support focus-marking and be viewed as manipulations of focus) to show that prominent material supported faster resolution of anaphoric reference.

While there is substantial evidence that various ways of placing a word or phrase in focus increase the attention paid to it, it is far from clear whether this extra attention speeds or slows comprehension of the focused material. The results that have been reported appear to be inconsistent. Birch and Rayner (1997) reported that eye movements were slowed while reading focused information, but Birch and Rayner (2010) reported that they were speeded. To add to the uncertainty, Ward and Sturt (2007) found no effect of focus on reading speed in a change-detection task, and Morris and Folk (1998) found no effect of focus on early reading times, but shorter re-reading times and fewer regressions back into focused elements than non-focused ones.

The reason for this lack of consistency may lie in the various ways that focus (or more generally, prominence) was manipulated in these experiments. Some of the experiments focused a word or phrase by making it the answer to a wh-question, while others focused a word by clefting it (*It was the X that. . ..*) or even by placing words in different syntactic positions, e.g., direct vs. oblique object, or predicate vs. prenominal adjective (which are probably better thought of as manipulations of prominence, not focus per se). However, even a single way of manipulating focus had different effects on reading speed in different experiments. In some cases (e.g. Ward & Sturt, 2007), focusing a word was confounded with repeating it in the prior context (which speeds reading; Raney, 2003; Raney & Rayner, 1995). In other cases (e.g., Birch & Rayner, 1997) focus was placed on a relatively large phrase, not a single word, potentially diluting its effects. Manipulating focus via clefting brings multiple factors to bear on processing: clefting a phrase introduces various exhaustiveness and existence presuppositions, and in some cases (Birch & Rayner, 1997; Morris & Folk, 1998) the manipulation of clefting a word or phrase was confounded with varying the prominence of other phrases in the sentence. All these factors could have contributed to the varying effects focus has been reported to have on reading time.

We thus suggest that these findings are inconsistent because they represent a variety of different manipulations of focus. We further suggest that this is the case because the manipulations were not based on clear theories of what focus is (and even because focus per se may not be a simple or coherent theoretical concept). In the present paper, we follow one widely-cited semantic analysis of the concepts that underlie focus (Schwarzschild, 1999). Schwarzschild's starting point is that linguistic prominence, or focus-marking, is an observable linguistic property (appearing, e.g., in English by a pitch accent – lengthening and pitch movement – or by syntactic devices such as clefting) (cf. Selkirk, 1984), and that lack of prominence indicates givenness. That is, while a word or phrase that is already given in a discourse may or may not receive focus-marking, a word or phrase that is not given must be prominent. Schwarzschild's novel contribution was a development of the idea (Halliday, 1967) that a word or phrase is given (and thus noninformative) if it is entailed by previous context. This analysis makes 'givenness' distinct from sheer prior occurrence in a discourse: Words and phrases that haven't appeared already can be given, if they are entailed; phrases that contain words that have appeared before can be non-given (which we will sometimes refer to as 'new') if they are not entailed by the context. For example, in the discourse *Mary thought about ordering duck, chicken, or beef. In the end, she ordered beef* the second occurrence of the word *beef* is given, but the phrase *ordered beef* is not, since it can't be inferred from prior context. This phrase must therefore receive focus-marking, which will fall on *beef* as the argument of the phrase's head (Selkirk, 1984). From this perspective, givenness is the fundamental concept, and focus is derivative, possibly but not necessarily reflecting lack of givenness.

Schwarzschild's (1999) analysis is extensive and detailed, and only a superficial description of it can be given here. As indicated above, the discourse status of a phrase is determined by what is entailed by the context. Roughly speaking, a part of a discourse is given if it corefers with, or is entailed by, an earlier part of a discourse. Givenness involves an entailment relationship from the prior discourse, e.g., *collie* entails *dog*, *golden retriever* entails *dog*, and *A golden retriever barked* entails *A dog barked*.[1]

[1] In Schwarzschild's terms, an utterance U is defined as being given if it has a "salient antecedent A and (a) if U is type e, then A and U corefer; (b) otherwise: modulo ∃-type-shifting, A entails the existential F-closure of U" (Schwarzschild, 1999, p. 151). This formulation requires that phrases larger than a single referring word but smaller than propositions be existentially type-shifted to the status of a proposition, since only propositions, not referring terms, can be entailed. Thus, the occurrence of *big dog* entails an existential type-shifted mention of dog as well as of canine. Further, the formulation describes the 'existential closure' of utterances in which focused (F-marked) terms are replaced by variables that are then existentially quantified over. We refer the reader to Schwarzschild (1999) for the detailed argument.