Decomposing the focus effect: Evidence from reading*

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Author note

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Abstract

Investigations of linguistic focus in reading have found mixed results: Some report a decrease in reading times on focused material (Morris & Folk, 1998; Birch & Rayner, 2010), while others report an increase (Birch & Rayner, 1997; Benatar & Clifton, 2014; Lowder & Gordon, 2015; Sloggett, Rysling, & Staub, 2019). In three studies using the Maze task (Forster, Guerrera, & Elliot, 2009), newness was crossed with focus, and the context preceding a focused target manipulated whether or not alternatives to that target word were mentioned. A slowdown in response times on focused targets compared to non-focused targets was found, as well as a slowdown on new foci compared to given foci, suggesting a focus cost that does not reduce to newness. When alternatives to foci were contextually mentioned, the slowdown on new foci was significantly reduced, suggesting that presenting information about alternatives aids reading of foci, and providing converging evidence for the role of alternatives in focus processing (Braun & Tagliapietra, 2010; Fraundorf et al., 2010, 2013; Gotzner et al., 2016; Husband & Ferreira, 2015). Controlling for newness versus focus and contextual mention of alternatives clarifies earlier reading results: previous reading work only found a focus speed-up after contextual mention of alternatives with no newness contrast between foci and baselines, and only found a slowdown in the absence of alternatives.

Keywords: Linguistic focus, Givenness/Newness, Alternatives, Maze task, Reading

1 Introduction

Studies that have investigated the processing of linguistic focus—sometimes characterized as the most “prominent” or “important” information in an utterance—in reading have found mixed results. Some studies find a decrease in reading times on focused material (Morris & Folk, 1998; Birch & Rayner, 2010), while others find an increase in reading times (Birch & Rayner, 1997; Benatar & Clifton, 2014; Lowder & Gordon, 2015; Sloggett et al., 2019). The current paper shows that the inconsistencies in reading can be brought in line with independent results from cross-modal priming, memory, and lexical decision studies (Braun & Tagliapietra, 2010; Fraundorf, Watson & Benjamin, 2010; Fraundorf, Benjamin & Watson, 2013; Gotzner, Wartenburg & Spalek, 2016; Husband & Ferreira, 2015). These studies have demonstrated a crucial role in the comprehension
of focus for alternatives—linguistic expressions that contrast with the focused element—which in the theoretical semantics literature are implicated in the interpretation of focus. Altogether, we argue that evidence from both reading and non-reading psycholinguistic studies converge with theoretical semantics on this unified notion of focus.

This paper reports three experiments using the Maze task (Forster, Guerrera, & Elliot, 2009) that demonstrate the role of preceding linguistic context in the comprehension of foci. In line with Benatar and Clifton (2014), Birch and Rayner (1997), Lowder and Gordon (2015), and Sloggett, Rysling and Staub (2019), an overall slowdown in reading times was observed on foci compared to material that was not put into narrow focus. Crucially, however, this focus slowdown could be modulated by contextual factors. Even though previous work has explained slowdowns on foci by appealing to their status as discourse new, the results of our studies demonstrate that the effects of focus and newness on reading times are empirically separable. Focus had an inhibitory effect in reading independently of newness, and reading times were longer on new foci than on given foci. Moreover, when more contextual information was provided about possible alternative expressions to the one in focus, a significant reduction in the focus slowdown was observed.

The studies presented in this paper provide evidence that the inconsistencies among previous investigations of focus in reading may be explained by defining previous experimental factors with respect to a more nuanced view of focus than has yet been adopted. The paper is structured as follows. The next section first gives a brief overview of the literature on the role of focus in reading. Then, the notion of focus that is adopted here is discussed—a notion of focus that is crucially distinct from the simple givenness/newness opposition. Section 2 then discusses three reading studies using the Maze task in which newness was crucially orthogonal to focus, and the level of contextual information that was provided to readers was systematically varied. Section 3 concludes.

1.1 Previous work

This section reviews the previous literature on the effect of linguistic focus in reading. As already mentioned above, some of these studies showed a facilitatory effect of focus on reading times (Birch & Rayner, 2010; Morris & Folk, 1998), while others showed a inhibitory effect of
Among these two sets of findings, significant effects were found in both early and late measures, only in early measures, or only in late measures. We also note here that Fraundorf et al. (2013) found slowdowns on foci as well using self-paced reading, but we will address these results separately in the General Discussion (Section 3). To make this list of logical possibilities complete, Ward and Sturt (2007) argued that there is no effect of focus at all, as they did not find any significant differences in reading times for focused versus unfocused material.

These studies did not manipulate focus in the same way. In making sure that a target word was in focus in the relevant conditions, previous work adopted either of the following two strategies: either a specific syntactic construction, such as a (pseudo)cleft, was used to put the target region in focus, or the focus status of the target region was manipulated by varying its preceding context. In this section, the focus manipulations used in these studies are first discussed in more detail, in order to come to a better understanding of what the relevant differences among them might have been.

1.1.1 Focus by clefts

Clefts were used as a focusing device by Birch and Rayner (2010) and Morris and Folk (1998), and pseudoclefts were used by Lowder and Gordon (2015), all of which found facilitatory effects of focus. But clefts were also used by Birch and Rayner (1997), who found an inhibitory effect of focus. In fact, this earlier study used the exact same target sentences as Birch and Rayner’s (2010) more recent study. An example of their target sentences in the focus and defocus conditions is given in (1) below.

(1) a. It was the **landlady** who confronted the woman who lived there. focus
b. The **landlady** confronted the woman who lived there. defocus

In the earlier Birch and Rayner (1997) study, second-pass reading times were longer on the target word *landlady*, and this word was re-read more often in (1a) than in (1b). In the Birch and Rayner (2010) study, both early and late measures showed shorter reading times on *landlady* in (1a) compared to (1b). The only difference between these two experiments was that the later experiment
also included a context sentence before each target sentence, while the early experiment did not. An example of a context sentence that preceded the target sentence in the later Birch and Rayner (2010) study is shown in (2) below.

(2) The tenants at the complex were sick and tired of all the noise coming from #204.

Since this was the only systematic difference between the two item sets, it seems likely that this caused the diverging results between these studies. But without a notion of focus that is context-dependent beyond givenness/newness, it is hard to explain the nature of this minimal pair.

In Lowder and Gordon’s (2015) investigation, (pseudo)clefts were used to manipulate focus, and longer reading times were found for focused words compared to defocused words in both early and late measures. As in the Birch and Rayner studies, the target sentence varied in each condition, but an important difference from the Birch and Rayner studies was that the target word in Lowder and Gordon’s materials occurred at roughly the same position across the different target sentences, and with roughly the same preceding lexical items. An example of the different target sentences in each condition of their study is given in (3) below, again with the target word in bold.

(3)  a. What the secretary typed was the official **memo** about... focus
    b. Yesterday the secretary typed the official **memo** about... neutral
    c. It was the secretary that typed the official **memo** about... defocus

In contrast, Morris and Folk (1998) found a decrease in reading times for foci, using the following stimuli:

(4)  a. While the waiter watched, it was the **accountant** who balanced the ledger. focus
    b. It was the waiter who watched while the **accountant** balanced the ledger. defocus

In these materials, the target word **accountant** was part of a cleft construction in the focus conditions, but was outside of the cleft construction in the defocus conditions.

The experiments reported by Lowder and Gordon and by Morris and Folk thus seem to form an-
other near-minimal pair: although their materials seem quite similar, the results that were obtained were completely different. Again, however, it must be noted that an important difference between the material used in both studies is that in Morris and Folk’s study (as in Birch & Rayner, 2010) the clause which contained the cleft was preceded by another clause, while the target sentence in Lowder and Gordon’s study appeared without any preceding context (as in Birch & Rayner, 1997).

1.1.2 Focus by context

In the studies by Benatar and Clifton (2014), Birch and Rayner (1997), Sloggett et al. (2019), and Ward and Sturt (2007), focus was manipulated using a preceding context, usually in the form of a question. For instance, Sloggett et al. adopted materials originally used by Cutler and Fodor (1979), in which a target sentence was always preceded by either one of the wh-questions in (5).

(5) a. Which man was wearing the hat? early focus
   The man on the **corner** was wearing the blue hat.
   b. Which hat was the man wearing? late focus
   The man on the corner was wearing the **blue** hat.

Using two different wh-questions allowed them to place focus on different constituents (either early or late in the sentence) without changing the target sentence: the wh-question in (5a) would give rise to focus marking on **corner**, but not on **blue**, while the wh-question in (5b) would give rise to focus on **blue** but not on **corner**. When comparing reading times on **blue** in (5a) to **blue** in (5b), longer reading times were found for the latter, indicating a slowdown for focused phrases.

A similar method was adopted in another of Birch and Rayner’s (1997) studies, in which question/answer pairs of the following form were used.

(6) a. What was the danger from? early focus
   The danger from the **poisonous gases** was that the laboratory might catch fire.
   b. What might catch fire? late focus
   The danger from the poisonous gases was that the **laboratory** might catch fire.

Again, longer reading times were found for targets when the wh-question put them in focus, al-
though this slowdown for foci was only found for target phrases that consisted of multiple words (like poisonous gases), not for single-word targets (laboratory).

Benatar and Clifton (2014) also found slowdowns for foci in three experiments that all used question/answer pairs to manipulate focus. For example, in a first experiment, they found longer reading times on Natalie when it received narrow focus as in (7b–c), compared to (7a) in which it received broad focus (the distinction between narrow and broad focus is discussed in greater detail in the next section). This held for first fixations, gaze durations, and total reading times.

(7)  
a. A: I’m confused, does Kyle care about Natalie?  
B: Kyle cares about Natalie, but he doesn’t show it.  
given  
b. A: Natalie is confused, does Kyle care about someone?  
B: Kyle cares about Natalie, but he doesn’t show it.  
new, rep  
c. A: Isabella is confused, does Kyle care about someone?  
B: Kyle cares about Natalie, but he doesn’t show it.  
new, no rep

In contrast to preceding studies, Ward and Sturt (2007) did not find any effect of focus on reading times in their experiment. Unlike the other studies, however, they did not use matrix questions to manipulate focus, instead they used a preceding context sentence that contained an embedded question. An example is shown in (8):

(8)  
a. I couldn’t decide which seat to take at the theater.  
I hoped the seat by the exit would give me a good view.  
focus  
b. I couldn’t decide whether I liked the new theater layout.  
I hoped the seat by the exit would give me a good view.  
no focus

Table 1 summarizes this section by giving an overview of all the relevant findings in eye tracking while reading.

On the one hand, studies that used question/answer pairs quite consistently found a slowdown on foci. On the other hand, the nature of the effects for clefts is not as clear. It is therefore not possible to attribute the differences in these findings to their use of different focus constructions, since there are contradictory results even among studies that all use clefts.
One of the explanations put forward for the slowdowns on foci is that foci are always new (Benatar & Clifton, 2014; Lowder & Gordon, 2015). Indeed, in all the studies that manipulated focus using question/answer pairs, the focused material in the target sentence formed the answer to the preceding question and was therefore generally newly introduced.

However, an important problem with this explanation is that the appropriate predictive conceptualization of focus is not strictly tied to newness. This point is motivated further in Section 1.2 below, but for now it suffices to say that if the notion of focus is indeed separable from newness, the question arises whether focus itself is the source of these effects, or whether it is newness. In other words: are foci really that special, or is it just the case that the parts of the sentence that convey new information are processed differently from the parts of the sentence that are discourse given?

Concerning clefts, the following generalization still holds: The studies in which the cleft construction appeared without a preceding context (i.e., Birch & Rayner, 1997; Lowder & Gordon, 2015) yielded longer reading times on foci, while the studies in which the cleft was preceded by another clause (i.e., Morris & Folk, 1998; Birch & Rayner, 2010) yielded shorter reading times on

<table>
<thead>
<tr>
<th>Study/Experiment</th>
<th>Inhibition</th>
<th>Facilitation</th>
<th>Focus construction</th>
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<tbody>
<tr>
<td>Birch &amp; Rayner (2010)</td>
<td>×</td>
<td>×</td>
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<td>Morris &amp; Folk (1998)</td>
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<td>Ward &amp; Sturt (2007)</td>
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<tr>
<td>Birch &amp; Rayner (1997) Exp 1</td>
<td>×</td>
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<tr>
<td>Lowder &amp; Gordon (2015)</td>
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<tr>
<td>Birch &amp; Rayner (1997) Exp 2</td>
<td>✓</td>
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<td>×</td>
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<tr>
<td>Benatar &amp; Clifton (2014) Exp 1 &amp; 2</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>Benatar &amp; Clifton (2014) Exp 3</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
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<tr>
<td>Sloggett et al. (2019)</td>
<td>✓</td>
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Table 1: Overview of focus constructions used in previous work on the effect of focus in reading
foci. The next section argues that this is as expected, because the appropriate conceptualization of focus predicts that comprehension of focus should be highly context-dependent. The contextual material that was presented before the target sentence in each of the studies should therefore be more closely examined, in order to determine why the addition of contextual information had such a large impact on the reading times obtained on words in focus.

1.2 Focus as an abstract category

Many of the studies discussed above rely, implicitly or explicitly, on the assumption that focused material in an utterance is the most “prominent” or “important” element. Lowder and Gordon suggested that readers systematically encode foci more deeply because of their prominence. Similarly, Birch and Rayner (1997) argued that “readers engage in additional processing” because of the importance of foci. The speed-up in reading times found in the later Birch and Rayner (2010) study was also explained in terms of prominence: because of the special status of foci, readers allocated more attention to them, and could therefore integrate them more easily than non-foci. An explanation along similar lines was put forward by Morris and Folk.

It is also often assumed that focused material is invariably new. For instance, Benatar and Clifton (2014) argued that longer reading times for foci are due to their newness. They suggested that because question/answer foci have not already been mentioned in the previous question, it takes more time for the comprehender to incorporate them into their discourse representation as compared to material that has been mentioned before.

While prominence and newness may matter for sentence comprehension, these lines of reasoning confront an important problem. In fact, foci are not always most prominent in their sentence, nor are they always new, as the formal semantics and phonology literatures have shown. Although it is empirically true that focus is tightly linked to prosodic prominence and interacts with newness, it cannot simply be reduced to either of these categories. This section surveys results from the literatures that argue explicitly against both these reductions. In particular, (i) focus cannot just be understood solely in terms of prominence, because there is no one-to-one mapping between prosodic prominence and focus (Selkirk [1984, 1995]), and (ii) focus cannot be understood solely in terms of newness, because focused material need not be new (Rooth [1996]; Beaver et al. [2007]).
Instead, the formal semantics literature (starting at least with [Jackendoff 1972]) takes focus to be part of the abstract representation of a sentence, much as other syntactic categories, such as phrases, gaps, and features, are part of the abstract make-up of a sentence. Under this view, there is only an indirect link between the prosodic and interpretational effects of focus, which is mediated by this abstract representation. Focus marking thus comes with prosodic and semantic consequences, though neither of these aspects determines the other. One focus can have more than one possible realization and can convey either new or old information.

As discussed above, linguistic material can be focused in different ways. A focus whose presence is mandated merely by context is called a free focus, whereas foci that are associated with a particular focus device, such as a cleft or focus particle, are called associated foci. The formal semantics literature takes these types of focus to have a shared interpretive core, but it is important to keep them analytically distinct for two reasons. First, since associated foci come with an explicit focusing device, their locations in sentences are marked more explicitly than those of free foci; this might give rise to different processing profiles for associated and free foci. Second, focus particles themselves (words like only, even or also) come with their own lexical semantics, though their interpretive contributions to sentences can only be computed if it is also known which elements are in focus. For this reason, upon encountering an associated focus, readers will not only have to process this focus itself, but might also start incorporating the contribution of the focus particle.

As demonstrated below, for both free and associated foci, however, focus is neither perfectly coincidental with prosodic prominence, nor is it perfectly coincidental with givenness/newness. This demonstration will also illustrate what different realizations of focus have in common and how they share an abstract underlying representation. Section [1.2.5] then shows how assuming such an abstract representation of focus appropriately captures the previous literature on focus in reading.

### 1.2.1 Focus is independent of prominence

**One prosodic realization, multiple free foci** In an answer to a wh-question, the constituent corresponding to the wh-phrase is in focus. For example, in the question/answer pair in (9), dinosaurs substitutes for what, and therefore is in focus (here and elsewhere indicated with square brackets and a subscript \( F \)).
(9)  
   a. A: What did Sarah read an article about?
   b. B: Sarah read an article about [DINOSAURS]$_F$.

In this case, the focused constituent also bears sentence-level stress and a pitch accent, and thus is the most prominent element in this sentence. This prosodic prominence is indicated throughout using small caps.

   Changing the form of a question, by definition, changes what the focus in the answer is. This is apparent in (10b), where now the subject Sarah is in focus because it corresponds to who in the question. Here, under a felicitous pronunciation of the sentence, the focus is again the most prominent element in the sentence.

(10)  
   a. A: Who read an article about dinosaurs?
   b. B: [SARAH]$_F$ read an article about dinosaurs.

Importantly, the form of a question affects not just the location of the focus in its answer, but also the size of the focused phrase. For example, in (11), the whole phrase an article about dinosaurs is in focus, because the question asks about what Sarah read.

(11)  
   a. A: What did Sarah read?
   b. B: Sarah read [an article about DINOSAURS]$_F$.

For free foci, their location within a sentence and their extent are, in principle, unrestricted. Depending on the question, larger and larger parts of an answer can be put in focus.

(12)  
   a. A: What did Sarah do?
   b. B: Sarah [read an article about DINOSAURS]$_F$.

(13)  
   a. A: What happened?
   b. B: [Sarah read an article about DINOSAURS]$_F$.

Note that, in the psycholinguistic literature, answers like (13) have been taken to be unfocused. However, under the conceptualization of focus in the formal semantics literature, it is possible to understand a sentence like (13) as either lacking a focus altogether or as in fact being focused, just
with a focus that extends over the entire clause (since the resulting prosody would be the same as in an out-of-the-blue context). It is not clear that this formal distinction has any discoverable processing consequences, since a sufficiently broad focus may distribute the effects of focus so generally that they would not be discernable via measurements on individual words. Nonetheless, following the formal semantics literature, the term narrow focus will be used to describe the configurations in (9)–(12), in which focus is on smaller, sub-clausal constituents, and the term broad focus for the configuration in (13).

The examples above also illustrate another crucial property of focus: not all material inside a focus is prosodically prominent. The material in focus can be, and often is, larger than the element that is prominent, a phenomenon called “focus projection” (Chomsky 1971; Selkirk 1984, 1995). The edges of a focused phrase thus do not necessarily align with the edges of the most prominent element in an utterance. In many (but not all) cases, this prominence falls somewhere within the focused phrase; in English, this is usually on the final element contained inside a focus, due to the language’s prosodic system. As a result, the narrow foci in (9), (11), and (12) and the broad focus in (13) are all pronounced in the same way, with a prominence on the last word of the sentence, *dinosaurs*. While prosody indicates the location of focused materials in these examples, it does not mark its full extent. Since one prominence pattern can correspond to more than one focus structure, free focus cannot simply be identified with prominence.

Before showing that the same holds for associated foci, it can already be noted here that this property of focus may have important consequences for the online comprehension of focus. If it turns out that foci in general give rise to a processing cost, this perhaps should not be surprising: because the boundaries of a focus-marked phrase are not always explicitly demarcated by the prosody or syntax of a sentence, a hearer or reader can face a parsing ambiguity problem when encountering a focus. In cases without restrictive preceding contexts, a comprehender has to determine which material is focused based on several sources of evidence, because even a complete acoustic signal may not be enough for them to determine where the boundaries of the focus-marked phrase lie.

**One prosodic realization, multiple associated foci** Unlike free foci, the location and size of associated foci can be discerned independently of any preceding question(s). The meaning of a
sentence containing a focus particle such as *only* varies with what is in focus [Jackendoff 1972]. In (14a) and (14b), moving the focus produces distinct meanings regarding what Sarah did not do: (14a) conveys that Sarah did not perform any other actions involving an article about dinosaurs, besides reading such an article; (14b) conveys that Sarah did not read anything else about dinosaurs than just an article.

(14)  
   a. Sarah only [read]$_F$ an article about dinosaurs. (...she did not write one)  
   b. Sarah only read an [article]$_F$ about dinosaurs. (...not a book about dinosaurs)

The interpretation of a sentence with a focus particle is directly dependent on the location and size of the associated focus. In (14a), since just the verb is focused, any actions other than reading are excluded, such as writing or reviewing. Similarly, in (14b), just the noun *article* is focused, so that the sentence conveys that Sarah did not read any other kinds of things about dinosaurs, such as books or dissertations.

Just as with free foci, while prominence marks the location of an associated focus in these examples, it does not obligatorily indicate its full extent. While the sentence in (15) is pronounced with a prominence on *dinosaurs* in all cases, the phrases in focus again can have different sizes, as shown in (15a–c).

(15)  
   a. Sarah only read an article about [dinosaurs]$_F$ (...not about penguins)  
   b. Sarah only read [an article about dinosaurs]$_F$ (...not a book about Antarctica)  
   c. Sarah only [read an article about dinosaurs]$_F$. (...she did not go fishing)

In (15a), it is articles about, say, penguins that are excluded by *only*, while in (15b) and (15c), it is other things that she might have read or done that are excluded. In other words, (15b) conveys that Sarah did not read anything besides an article about dinosaurs, and (15c) conveys that Sarah did not do anything other than read an article about dinosaurs. In all these cases, *dinosaurs* is prosodically prominent, even though three interpretations can clearly be distinguished. Thus, associated focus also cannot be equated with prominence.
One focus, several pronunciations: Effects of givenness  The above has demonstrated that focus, whether free or associated, cannot be reduced to prominence. The most prominent element in an utterance can correspond to multiple possible focus structures, differing in their size. In these cases the focus still contains the most prominent element, but even this is not necessary.

Because foci vary in size, an utterance can contain more than one focus. These can be nested, where one focused phrase occurs inside another focused phrase, as in (16b) below.

(16) a. What happened?
    b. [Sarah only read an article about [dinosaurs]$_F$.]

The simple fact that narrow foci can occur inside broad foci illustrates again that it is difficult to speak of linguistic material as either “focused” or “unfocused” without adopting the notions of broad and narrow focus. In (16b), the whole sentence receives broad focus, but intuitively, only dinosaurs is in focus—or at least, more focus-marked than a phrase like Sarah. In the remainder of this paper, only narrow foci will be considered to be real foci, while broad foci will be treated on a par with sentences that lack focus marking. This is consistent with the previous literature on the reading of focus.

An utterance can also contain multiple narrow foci that are disjoint. In (17b), there is a narrow focus on Sarah, since it corresponds to the wh-phrase in the question, and there is also a narrow focus on dinosaurs, due to the intended meaning of this sentence (Sarah read an article exclusively about dinosaurs, not penguins or walruses).

(17) a. Who only read an article about dinosaurs?
    b. [Sarah]$_F$ only read an article about [dinosaurs]$_F$.

However, the associated focus in (17b) is not the most prominent element. Rather, it is the free focus on Sarah that is most prominent and bears a pitch accent.

There is thus a many-to-one mapping between prominence and focus: the same focus might be realized with or without sentence-level prominence, depending on context. The associated focus in (17) can be most prominent in a different context, like the one in (18).

(18) a. What did Sarah read an article about?
b. Sarah only read an article about $[\text{dinosaurs}]_F$.

How the associated focus in this pair of examples is pronounced depends on whether it has already been mentioned. In (17), dinosaurs is given in the preceding question, while in (18), it is not. As discussed further below, it is generally true (though not without exception) that given foci are pronounced differently than other foci. Taken together with the results from the preceding section, this entails that there is no one-to-one mapping between focus and prominence. Thus, no reduction of one to the other is possible.

1.2.2 Focus is independent of newness

As discussed further below, it is generally true (though not without exception) that given foci are pronounced differently than other foci. Taken together with the results from the preceding section, this entails that there is no one-to-one mapping between focus and prominence. Thus, no reduction of one to the other is possible.

As early as Chafe (1976), it was observed that not all foci convey discourse new information. Roughly speaking, a linguistic expression is given when it has been mentioned in the preceding context; otherwise it is new. This treatment of newness as the complement of givenness follows the theoretical literature, which defines givenness in terms of literal previous mention or semantic entailment (Schwarzschild 1999). There is a tight connection between newness and sentence-level prominence: given material cannot be more prominent than non-given material (Féry & Samek-Lodovici 2006; Kratzer & Selkirk 2020).

While many foci are new, there are foci that are given. The associated focus in (17b) above is a “second-occurrence focus (SOF)” (Partee 1991). The presence of the focus is discernable because of the particle only, and the focused material is given. The associated focus dinosaurs had already been mentioned once, in the preceding question (hence why it is a second occurrence). Like other given material, it is less prominent than new material in the same utterance. As a consequence, in (17b), it is the earlier focus on Sarah, which had not been mentioned before, that is most prominent.

There are also free foci that are given, as in the question/answer pair in (19).

(19)  A: What did Sarah read an article about? Did Sarah read an article about penguins or walruses?
    B: Sarah read an article about $[\text{penguins}]_F$.

In B’s answer, penguins is focused, because it corresponds to the wh-phrase of the question. At the same time, it has been mentioned before and is therefore given. In fact, the entire sentence
is given, because it introduces no new material relative to the preceding discourse. Since every
utterance must have at least one sentence-level prominence, this is assigned according to prosodic
defaults (Selkirk, 1984, 1995). In other words, given material can only be prominent if there is no
new information in an utterance.

At the same time, while many new phrases are indeed in focus, new material also does not have
to constitute a focus on its own. For instance, in (20), an article itself does not bear a narrow focus;
it does not receive any prosodic prominence, nor does this phrase itself provide an answer to the
question on its own. Instead, if anything is focused, it is B’s whole utterance, which would bear
broad focus. While it would thus be accurate to say that the phrase an article here is inside the
focus in (20b), it would be misleading to say that this phrase is the focus or just in focus, because
both of these phrases are understood to describe the entire extent of the focus of a sentence. Perhaps
this point has been the source of some confusion.

(20)  a. A: What happened?
     b. B: [Sarah read an article about dinosaurs]_F.

Summing up, then, foci can be either given or new, and new material is not necessarily in focus.
Thus, focus is independent of newness.

1.2.3 An alternative notion of focus: one based on alternatives

Since focus cannot be reduced to prominence or newness, how can it be characterized indepen-
dently? In the standard theory of associated foci, they are understood as introducing alternatives, a
set of expressions that contrast with the focused element (Rooth, 1985). Alternatives also provide
a useful way of more precisely characterizing free foci, unifying the two different types of focus
(Rooth, 1992).

It easy to see why a notion of alternatives is needed for associated foci. The reader can verify
that the meanings of focus particles refer to alternate versions of the sentence that differ solely
in the position of focus. For only, all of these alternatives are negated, except for the one that is
identical to the sentence in which it appears. Thus, (21) entails that Sarah read an article about
dinosaurs and that she read nothing else.
Sarah read only [an article about dinosaurs]$_F$.

$\sim$ Sarah read an article about dinosaurs

$\sim$ $\sim$(Sarah read a book about vacuum cleaners)

$\sim$ $\sim$(Sarah read a magazine about Antarctica)

Such alternatives to foci are also involved in the interpretation of free foci, where these alternatives govern the well-formedness of question-answer pairs (what is called question-answer congruence). A focus that occurs without a particle still evokes alternatives, as shown in (22), though only the alternative corresponding to the actual sentence is entailed.

(22) a. What did Sarah read?
    b. Sarah read [an article about dinosaurs]$_F$

    $\sim$ Sarah read an article about dinosaurs

    $\triangleright$ Sarah read a book about vacuum cleaners

    $\triangleright$ Sarah read a magazine about Antarctica

In the absence of a focus particle, other alternatives to a focus do not factor directly into the meaning of the utterance (represented with $\triangleright$). Instead, in (22), the set of alternatives of the focus matches the question, since each alternative constitutes a congruent answer to the question. By contrast, in (23), this is not the case with the focus structure as it is indicated, and the result is infelicity.

(23) a. Who read an article about dinosaurs?
    b. #Sarah read [an article about dinosaurs]$_F$

    $\sim$ Sarah read an article about dinosaurs

    $\triangleright$ Sarah read a book about vacuum cleaners

    $\triangleright$ Sarah read a magazine about Antarctica

Neither Sarah read a book about vacuum cleaners nor Sarah read a magazine about Antarctica is an answer to the question.

A type of free focus not discussed thus far is contrastive focus, in which a particular phrase stands in clear contrast to a contextually mentioned phrase, i.e., an alternative. For example, in
Like associated focus, this type of focus is generally pronounced with prosodic prominence and a pitch accent on the focused phrase, indicating that it contrasts with one of its contextually mentioned alternatives (though see Katz & Selkirk, 2011, who argue that contrastive focus is realized with a slightly different intonational contour than free focus).

With alternatives, then, it is possible to precisely characterize focus as an abstract category. While alternatives were initially motivated by looking at associated foci, the examples above show that they are also involved in the interpretation of free foci. It should be clear how this notion of focus is independent of prosodic prominence. The prosodic realization of an utterance does not uniquely determine where focus is located or how large it is, and therefore what alternatives are evoked for the purposes of interpreting a focus particle or enforcing question-answer congruence.

Understanding focus as an abstract category also makes it conceptually distinct from newness: although newness (or rather, givenness) might affect prosody independently, the presence or absence of focus on a certain phrase has nothing necessarily to do with the novel information status of that phrase. The semantic effects that are generally assumed to be central to focus are conceptually distinct from givenness: the relevance of alternative expressions to the one in focus is independent of whether that expression has been mentioned in the discourse or not.

In what follows, this conception of focus as an abstract category will be helpful not only for understanding the previous literature, but also for accurately guiding the design of novel experiments that can disentangle the effects of newness, focus, and contextual information more generally.

1.2.4 Prominence and newness in previous work

With the above understanding of focus in place, this section discusses how the previous literature can be viewed in a clearer way. All the studies that used question/answer pairs to investigate the profile of focus in reading found longer reading times for foci compared to non-focused material.
In all of these studies, focused material was new while non-focused material was given. The comparison was therefore not only one between focused and unfocused material, but also between new and given material. The newness comparison made by these studies is summarized in Table 2 below.

Because focused material in the question/answer pair studies always aligned with new material, it might be that the focus slowdowns observed in all these studies was due to newness, as suggested by Benatar and Clifton. However, these slowdowns might also be due to inhibitory effects of focus processing itself, or due to a combination of newness and focus.

In the studies that used clefts (Birch & Rayner, 1997; 2010; Lowder & Gordon, 2015; Morris & Folk, 1998), target conditions involving focus marking were always new, because the target word was never mentioned in the previous context. In many of these studies, the non-focused baseline consisted of material outside of the cleft construction. Since the whole target sentence was new, this baseline was just as new as the material inside the cleft. In terms of newness and focus, these studies therefore always made a comparison between new foci and new non-foci. This is shown in Table 2 as well.

But Table 2 already shows that newness cannot be the whole story: if slowdowns only occurred because of newness of the target material, similar slowdowns would not be expected for studies that compared new focus targets to new non-focused baselines. Concretely, in the Birch and Rayner (1997) and the Lowder and Gordon (2015) studies, which used clefts, all material was new, and the observed slowdowns in these studies therefore cannot be attributed to newness alone.

More generally, looking at all studies in Table 2, it is also easy to see that the previous literature never fully crossed newness with focus: a condition with given foci was never tested. To disentangle the effects of newness and focus in reading, newness was therefore always crossed with focus in the studies presented below.

1.2.5 Alternatives in previous work

The focus slowdown in the all-new cleft studies (e.g., Birch & Rayner, 1997; Lowder & Gordon, 2015) already suggest that it is not just newness that slows readers down. Instead, focus itself might have an inhibitory effect. If this is indeed true, then why is it that processing focus is more costly? We advance an hypothesis below, which relies on the notion of alternatives.
Although many formal approaches to focus make reference to the alternative-generating potential of foci, none of the existing studies on focus in reading explicitly take this aspect of focus into account. However, in a separate line of psycholinguistic research, it has been demonstrated that sentences with a narrow focus lead to the access of alternatives to the accented/focused constituent (e.g., Braun & Tagliapietra, 2010; Fraundorf et al., 2010, 2013; Gotzner et al., 2016; i.a.). Evidence from several priming, lexical decision and memory studies has suggested that such alternatives are accessed during online language comprehension, indicating that the processing of focus is at least accompanied by the processing of alternatives. Therefore, if it turns out that there is indeed a cost associated with focus, a sensible hypothesis would be that this is exactly because of the function of focus as an alternative-accessing structure.

As outlined above, sentences containing associated foci come with a set of additional inferences. In order to derive these additional inferences, readers must perform some additional tasks. Concretely, the difference between interpreting a sentence with a broad focus and a sentence with a particle and a focus is that in the latter case readers also need to determine which phrase is focused, and they need to derive the additional inferences triggered by the focus particle. In any sentence containing a cleft or particle, readers will have to engage in at least three additional processes. First, they need to determine which phrase is associated with the cleft/particle. Second, they need

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<th></th>
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<th>Facilitation</th>
<th>Alternatives</th>
<th>Newness</th>
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<td>Late</td>
<td>Early</td>
<td>Late</td>
</tr>
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</tr>
<tr>
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<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
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<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
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<td>✓</td>
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<td>x</td>
</tr>
<tr>
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<tr>
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</table>

Table 2: Overview of previous context manipulations in previous work on focus in reading
to identify the relevant alternatives to this focused expression. And third, they need to determine what effect the presence of such a focusing device together with the focus itself has on the meaning of the sentence as a whole. Even if the location and identity of a focus are fully specified, readers still need to identify which alternative expressions are relevant and they have to incorporate this derived alternative set with the meaning of the particle/cleft. General slowdowns on foci are then perhaps expected if it is assumed that these additional processes are launched immediately when these foci are recognized.

The alternative set that is necessary for the interpretation of a focus depends on its context. In establishing which alternatives are members of the contextually relevant set of alternatives, readers depend on (linguistic) context and world knowledge (Rooth, 1992). Like the interpretation of other context-dependent expressions, such as anaphoric pronouns or presupposition triggers, it might therefore be that interpreting a focus in the absence of a suitable context is what requires some amount of effort and thus slows readers down. Put differently, perhaps readers are able to complete the process of establishing an alternative set faster if a sufficiently rich context is provided that aids them in doing so. Thus, the presence of explicit alternatives in the preceding context may aid the comprehender in interpreting the focus itself, exactly because foci are context-dependent expressions. Based on this, it is possible to formulate the following general hypothesis:

\[ \text{(25) \ Hypothesis: The presence of explicit contextual alternatives aids the parser in comprehending focus, because interpreting foci involves deriving a context-dependent alternative set and explicit mention of (some of these) alternatives allows the parser to identify this set more quickly.} \]

Before outlining the specific ways in which one could think of this context effect in more mechanistic terms, it is perhaps worthwhile to first point out that such effects of context may already be visible in the existing literature on reading. Recall that Morris and Folk (1998) and Lowder and Gordon (2015) found contradictory results, even though both studies used (pseudo)clefts. Similar to the effect of only, both clefts and pseudoclefts are often taken to come with an exhaustivity inference: in both constructions, alternatives to the expression inside of the cleft seems to be negated (Halvorsen, 1977; Horn, 1981; É. Kiss, 1998; Krifka, 2006; Velleman et al., 2012). That is, note that the sentences in (26a) and (26b) are very similar in meaning, namely, that the secretary did not
type anything besides the official memo:

(26)  
   a. What the secretary typed was the official \textbf{memo} about...
   b. The secretary typed only the official \textbf{memo} about...

Recall that one crucial difference between these two studies was that Morris and Folk’s items contained explicit contrastive alternatives that were already mentioned when the focused material was encountered. In contrast, Lowder and Gordon’s materials did not contain any context at all. Contextually mentioned alternatives were therefore present in the first case, where reading times were not slowed, but absent in the latter. This is summarized for these, and all other relevant studies, in Table 2 as well.

If comprehenders incorporate the information that a phrase is focused as soon as possible, in the absence of any contextual information in light of which a focus phrase should be interpreted, readers might be expected to slow down when they have trouble finding the right alternatives. Concretely, when reading the items in Lowder and Gordon’s focus conditions, like in the sentence in (26a), a comprehender might wonder: What is it that the secretary did \textit{not} type? In contrast, in Morris and Folk’s focus condition, an example of which is repeated in (27) below, it is clear that it is the waiter who did not balance the ledger.

(27) While the waiter watched, it was the \textbf{accountant} who balanced the ledger.

Indeed, a slowdown was observed by Lowder and Gordon (2015), but not by Morris and Folk, (1998).

The contrast between the early Birch and Rayner (1997) study and the later Birch and Rayner (2010) study seems to provide support for this hypothesis as well. The additional context sentence in Birch and Rayner (2010) might have helped their readers in establishing an alternative set, whereas the lack of contextual information in Birch and Rayner (1997) may have caused a slowdown. In fact, all of the studies that found facilitation in Table 2 were ones in which alternatives were present before the focused material.

Based on this—and as is often done in the formal literature—it might be possible to draw a parallel between focus and the way in which the interpretation of anaphoric expressions depends
on previous context. In processing terms, this would mean suggesting that readers revisit memory representations of previously encountered words and phrases upon encountering such an expression. Similar to what has been proposed for anaphora, readers might therefore perform a search in memory in order to retrieve salient alternatives upon encountering a focused phrase. If alternatives are made salient in the preceding linguistic context, comprehenders may be able to terminate this search relatively quickly. However, if the context lacks any mention of alternatives, readers may not be able to retrieve the alternatives from memory and they may have to accommodate a novel context that allows them to derive the alternative set. It may then take a longer time before the search for the relevant alternative set is terminated. This may result in slowdowns on foci when they occur in an out-of-the-blue context.

But alternatives to an expression in focus do not necessarily have to be derived via a retrieval mechanism. Note that alternatives are usually semantically associated with focus and they should also be able to replace the expression in focus. It might therefore also be conceivable that alternatives are derived by a forward-looking mechanism that allows comprehenders to activate words and phrases beyond the unfolding sentence. Perhaps readers generally pre-activate a cohort of associated continuations whenever a sentence unfolds. Upon identifying the focus, readers may therefore select from this initial pre-activated cohort a smaller set of expressions that can function as the relevant alternative set. See, e.g., Fox and Katzir (2011) for specific restrictive grammatical mechanisms, as well as Husband and Ferreira (2015) and Gotzner et al. (2016) for a psycholinguistic account of how the processing of focus proceeds via the processing of alternatives.

In this latter scenario, it may follow naturally that providing explicit information about contextual alternatives aids a reader in arriving at these alternatives more quickly. Explicit alternatives might help pre-activate alternate continuations in a more targeted and therefore more efficient way, such that the process of establishing an alternative set is only costly in the absence of contextual alternatives. The more contextual information a reader already has, the more relevant this cohort of associated future continuations may be, and so the less additional effort needs to be expended to arrive at the proper set of alternatives.

These are only two of the possible scenarios in which the context-dependence of foci and their alternative sets might be implemented by an actual human parser, and of course these two scenarios are not the only ones. Although future work will have to determine the exact implementation,
this review of the previous literature already suggests that the comprehender is aided in reading focus by the presence of explicit alternatives. In converging with other psycholinguistic methods indicating that focus comprehension crucially is a context-dependent process, this prior literature strongly suggests that the alternatives-based hypothesis for focus in reading is on the right track.

Note, however, that the presence of contextual information might not be enough to explain that these studies in fact observed a significant speed-up, not just the lack of a slowdown. It seems that focus marking itself actually gives rise to speed-up compared to non-focused material when enough contextual information is present. If the speed-up on such foci is indeed replicable, this may suggest that processing of a focused target is already partially initiated before the target itself is encountered, but only when it is preceded by contextual alternatives. This may be the case, for instance, because the presence of these alternatives allows readers to anticipate which expression is in focus already when they reach the associated particle.

However, looking more closely at Morris and Folk’s (1998) materials may provide a clue for an alternative explanation about why such a speed-up may have arisen. In their analysis (an example item is repeated in (28) below), the focused phrase was always compared to the phrase which formed the alternative to the expression in focus, i.e., waiter in (28).

(28)  a. While the waiter watched, it was the accountant who balanced the ledger.  

       focus

   b. It was the waiter who watched while the accountant balanced the ledger.  

       defocus

It may be that this baseline expression was ultimately also understood as focused by the readers of these sentences, because waiter itself stands in clear contrast with accountant. In other words, the target word in the defocus condition might have received contrastive focus as well. In that case, the comparison made in this study would have been one between contrastive focus without a preceding alternative and a focus inside a cleft with a preceding alternative, where the latter type of focus gave rise to shorter reading times than the first.

To explicitly test the hypothesis in (25), the interaction between newness/givenness and focus was investigated more systematically. The role of contextual information was also tested more broadly, by directly investigating whether the presence of explicitly mentioned alternatives has an
effect on the reading times of associated foci. Together, these experiments also compared free with associated focus, demonstrating a consistent effect of focus across all of the constructions that the previous literature has so far manipulated with different results.

2 Online reading studies

This section discusses three Maze task experiments, which provide response time data that demonstrate the effect of context on the online comprehension of focus. More specifically, in Experiment 1, an effect of narrow focus was found which was independent of newness. In Experiment 2 and Experiment 3, it was shown that the effect of focus can be modulated by providing more contextual information. These online measures thus provide converging evidence for the relevance of contextual factors in the processing of focus.

2.1 Experiment 1

In Experiment 1, two factors were manipulated: focus and newness. Response times to new versus given target words were compared, as well as response times to narrow focused target words versus words that were part of a broadly focused phrase. This means that focus was manipulated orthogonally to newness, allowing us to determine whether focus has an effect on response times independently of newness.

2.1.1 Method

Participants 51 participants were recruited via Prolific and were paid $12 hourly rate for their participation. All participants were native speakers of English and gave explicit consent to participate. Participants that had an accuracy of less than 80% on the comprehension questions or that did not complete more than 70% of the Maze sentences were excluded from analysis. Data from 48 participants were included in the analysis; 3 participants were excluded because they failed to complete more than 70% of the Maze sentences.

Materials In all the experiments presented here, every item took the form of a short dialogue between two speakers, Speaker A and Speaker B. Speaker A first introduced a short premise,
followed by a question. Speaker B’s utterance formed a response to the question from Speaker A. Speaker B’s utterance was considered the target sentence and was presented using the Maze task. Within one item, the same sentence was the target for every condition, in order to ensure that differences across conditions would only be due to preceding context sentences. Within each target sentence, measurements on a single target word were expected to particularly reflect the effects of preceding contexts.

Preceding context questions determined whether a target word was new or given by either mentioning that target word in the question or not. Orthogonal to this manipulation of newness, preceding questions determined whether target words received narrow focus (NF) or broad focus (BF) by asking for differently specific information. NF questions were ones to which a following target word on its own would provide a complete answer; BF questions were ones to which a target word alone would not seem a complete answer. An example of one experimental item in all four conditions is given in (29) below. For comparability with both the previous literature and with the later experiments presented in this paper, the presence or absence of a contextual alternative (alt vs. no alt, respectively) to the target word is also noted. In (29), the target word is lawyer.

(29) Speaker A: This company often makes bad decisions, but...

a. Did they hire a lawyer last fall, or an accountant?  
   NF (alt), given
b. Did they hire a lawyer last fall?  
   BF (no alt), given

c. Did they hire an accountant last fall?  
   NF (alt), new

Speaker B: I think they announced they hired a lawyer last fall, but I’m not sure.

To NF questions, as in (29a) and (29c), lawyer would have been a complete answer. Across all items, for creating narrow focus and givenness on the target word, alternative questions (i.e., questions in which two alternatives are given in the form of a disjunction) were used. Since the answer to such a question is always expected to be one of the mentioned alternatives, the answer was either accountant or lawyer in the case of (29a). Therefore, these questions put only the target word lawyer in focus in the target sentence.
The NF new items always employed polar questions (i.e. questions whose expected answers are either confirmative or negative) that mentioned a different alternative from the one mentioned in the target sentence. The target sentence would therefore be unambiguously interpreted with corrective narrow focus on the target word.

After BF questions, lawyer in the target sentence would be part of a larger broadly focused phrase. The BF given condition always used polar questions as well, but in these questions the alternative was the same as in the target sentence. This puts the target sentence as a whole in broad focus, as is the case in (29b). That is, both the wh-question in (29d) and the polar question in (29b) put the whole phrase they hired a lawyer last fall in focus, because this is the phrase that forms a congruent answer to each of these questions. Although it would be less natural, it is still technically possible that (29b) could be interpreted with narrow focus on the target word. It is true that there is nothing that prevents a reader from interpreting this as a narrowly focused phrase. However, comprehenders default to the broadest possible focus that is supported by the context (Harris & Carlson, 2014, 2017), and this accords with theoretical semantic assumptions as well. Assuming that narrow focus is more costly than broad focus, and that a narrow focus parse was maintained in at least some of our items’ BF given conditions, the estimated effect of focus would be, if anything, slightly diminished.

In each item, the target word was always followed by an adverbial phrase (last fall) which served as a spillover region. This spillover region was also always followed by a second clause (but I’m not sure), to ensure naturalness of the target sentence in the BF given condition.

In total, 48 items were constructed, each with the four conditions illustrated in (28). All items for Experiment 1 can be found in Appendix II; these were normed in an acceptability judgment study, the results of which can be found in Appendix I, Section 4.1. 96 filler items were added which also consisted of multi-line discourses. Using a Latin Square design, all 48 base items were divided over 4 lists, and each participant only saw one such list.

**Procedure** Experiment 1 employed the Maze task (Forster et al., 2009). This task is similar to more commonly used self-paced reading in that response times are measured using button presses. However, instead of simply pressing a button to advance to a following word each time a participant has read the current word, participants in the Maze task see each word in the target sentence
presented alongside a distractor word (or foil). Participants must at every new word choose the correct continuation between the intended item and its foil, which would not make a sensible continuation.

Foils were automatically generated using the AutoMaze software developed by Boyce, Futrell, and Levy (2020). This algorithm selects distractor words that are of the same length as the target word, and that are predicted by NLP language models to have a poor fit to the given context. For each upcoming word, a conditional probability distribution is determined for potential foils of the same length given the preceding sentence context. The words with a predicted probability below a certain threshold (or, above a certain surprisal threshold) are then selected by the AutoMaze algorithm as the distractor. Word frequencies that form the input to these models are obtained from the Google Books Ngrams corpus (Michel et al., 2011).

An example of the output for one target sentences is given in (30) below. On the second line, the distractor word is presented below its corresponding word of the target sentence.

(30) I think Sarah said she wanted cake for dessert, but I am not sure.
    x-x-x goods Runes blue sum bottom knee sum classed, tax Sin far sat send.

In this way, sentences were presented incrementally, and the response time required to make and execute a decision about which word should continue a sentence was measured.

On every trial, participants first read a context sentence on one screen. On a subsequent screen, participants were presented with the start of the target sentence in the format of the Maze task. That is, only the utterance of Speaker B was presented incrementally; the utterance of Speaker A was presented all at once for normal reading. All experimental trials were followed by a comprehension question, which made sure that participants had read the context preceding the target sentence. This was because there was more cause for concern that participants might not read the contexts than that they might not read the target sentences. Participants had to read the beginning and all subsequent material of a target sentence in order to even make a decision about which word could form a potential continuation as the sentence went on. If they chose the wrong word in the Maze task, they were directed to the next item and their responses on the rest of the words in the target sentence were not recorded. But participants could successfully go through a whole target sentence in the Maze without having read its preceding question, and so comprehension questions...
Table 3: Experiment 1: mean RT and standard error of the mean in each condition two words before, at, and two words after the target word.

were included after each trial that encouraged careful reading of the preceding context.

Before being presented with the target stimuli and fillers, participants read a short description of the task, followed by five practice items. Practice items were similar to experimental items in that they involved a short context sentence, followed by a sentence presented in Maze format and a comprehension question. After the short practice phase, the experimental items were presented along with the fillers in a pseudo-randomized order.

Transparency & Openness All materials, data and analysis code of this and subsequent experiments are made available via the Open Science Framework and can be accessed at https://osf.io/k6tbw/?view_only=71d86431090046929d56f1ba94dccc8b. Data were analyzed using R, version 3.6.3 [R Core Team, 2007] and the package ggp1ot, version 3.3.3 [Wickham et al., 2016]. This study’s design and its analysis were not pre-registered.

2.1.2 Results

Mean response times for the target word and its surrounding regions in all conditions are given in Table 3. They are plotted with 95% confidence intervals in Figure 1.

Linear mixed effects models were fitted to response times on target words using the lme4 package (Bates & Sarkar, 2007) for mixed effects models in R [R Core Team, 2007]. Models included fixed effects of focus and newness, each with two levels. Random slopes and intercepts were in-
Figure 1: Experiment 1: mean RT in each region in each condition. Error bars represent the 95% confidence interval.

Included for both subjects and items (Baayen et al., 2008). Separate models with log-transformed response times and untransformed response times as a dependent measures were fitted. Fixed effects estimates for the model fitted to log-transformed responses are reported in Table 4, while estimates for the model fitted to untransformed responses are reported in Table 5. Due to the fact that multiple comparisons were performed on the same response time data, a $t$-value of 2.25 was considered to be the critical value for significance. The broad focus and given conditions were treated as baselines throughout.

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Table 4: Parameter values for fixed effects in mixed linear regression model of LogRTs in Experiment 1.

For response times on the target word, both models found two significant effects. First, sig-
<table>
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Table 5: Parameter values for fixed effects in mixed linear regression model of raw RTs in Experiment 1.

Significantly positive estimates of focus indicate that targets in narrow focus were responded to more slowly than targets that were part of a broad focused phrase. Second, significantly positive estimates of newness indicate that responses were slower in the new conditions compared to the given conditions. The interaction estimates did not reach significance in either model. But a pairwise comparison on untransformed response times revealed that the effect of focus did not reach significance in the new conditions (t = .92), indicating that the significant estimate for focus is mainly driven by the effect of focus in the given conditions.

### 2.1.3 Discussion

In addition to being affected by newness, response times on the target word in Experiment 1 also depended on whether the target word was in narrow or broad focus. Even when targets words were given, response times were longer when these targets were also narrowly focused compared to when they were part of a broad focused phrase.

Since Experiment 1 showed an effect of focus on response times even when the target word was given, this focus effect cannot be explained in terms of newness alone. Such explanations of the focus effect in reading therefore will not do: an explanation of the focus effect in terms of properties that are inherent to foci needs to be sought. Experiment 2 makes a first attempt to do so by testing the hypothesis that what is costly about focus is the need for alternative set generation.

### 2.2 Experiment 2

The difference between Experiment 1 and Experiment 2 is that in the latter, the focus particle *only* was added to the same target sentences. This particle was unambiguously associated with the target
word and served two purposes. First, it allowed us to make a direct comparison between free and associated focus, by comparing the results from Experiment 1 to those of Experiment 2. Second, the particle put the target word in focus in all of the conditions of Experiment 2. It therefore allowed assessment of the effect of providing an alternative to a target word in a preceding context on the reading of the target independently of differences in focus status.

2.2.1 Method

Participants 58 native speakers of English were recruited via Prolific. All participants were compensated at a $12 hourly rate. Completion of the experiment took roughly 50 minutes including the practice phase. Data from 48 participants were included in the analysis; 10 participants were excluded because they failed to complete more than 70% of the Maze sentences.

Materials The stimuli of Experiment 2 were exactly the same as in Experiment 1, except for the presence of the particle only immediately before the target word in each target sentence. An example of an item is shown in (31) below.

(31) Speaker A: This company often makes bad decisions, but...
   a. Did they hire a lawyer last fall, or an accountant? (NF) alt, given
   b. Did they hire a lawyer last fall? (NF) no alt, given
   c. Did they hire an accountant last fall? (NF) alt, new
   d. What did they announce last time? (NF) no alt, new

Speaker B: I think they announced they hired only a lawyer last fall, but I’m not sure.

As in Experiment 1, a newness manipulation determined whether the target word was new or given by the time participants read it. Crucially differently from Experiment 1, the target word of every item in Experiment 2 was always narrow focused. In (31), lawyer is associated with only, which puts it in narrow focus. This position of only immediately before the target word prevented it from being interpreted as associated with any other word or phrase in the sentence. In order to facilitate comparison of these conditions with the ones from Experiment 1, the label “NF” is shown

32
next to all the conditions of Experiment 2 in (31).

In order to interpret the meaning of *only* in a target sentence, participants had to generate a set of contextually relevant alternatives to the target word. As noted above, the preceding context questions used in both Experiment 1 and Experiment 2 manipulated the presence versus absence of an alternative to the target word. In Experiment 2, where all target words are focused by their association to *only*, this manipulation thus assessed the effect of explicitly provided alternatives in processing focus. Since an alternative question like that in (31a) presupposes that the mentioned alternatives are the only possible hires, *accountant* formed a salient alternative to the target *lawyer*. Similarly, the polar question in (31c) explicitly mentioned an alternative to the target word *accountant*, but did not mention the target word itself. Thus, (31a) and (31c) are labeled “alt,” while (31b) and (31d) are labeled “no alt.”

All materials of Experiment 2 were assessed in an acceptability judgment study, the results of which can be found in Appendix I, Section 4.2.

**Procedure**  As in Experiment 1, the target sentences in Experiment 2 were implemented in the Maze task, in which response times were measured as the time it took for participants to choose between the actual continuation word and a foil.

Since the materials for Experiment 1 and Experiment 2 were the same except for the word *only* in the target sentence, the foils generated for Experiment 1 were used to create the foils for Experiment 2. To do so, the target sentences of Experiment 2 were used as the input to the AutoMaze algorithm to generate the appropriate foils for the word *only* in each item. Then, these foils for *only* were inserted into the foils that were already generated for Experiment 1. In this way, the differences between Experiment 1 and Experiment 2 were kept as minimal as possible, to ensure maximal comparability between the two experiments.

Fillers and practice items, as well as comprehension questions, were the same as in Experiment 1.

**2.2.2 Results**

Mean response times for the target word and its surrounding regions in all conditions are given in Table 6. They are plotted with 95% confidence intervals in Figure 2.
### Table 6: Experiment 2: mean RT and standard error of the mean in each condition two words before, at, and two words after the target word.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Previous -1</th>
<th>Previous</th>
<th>Critical region</th>
<th>Spillover</th>
<th>Spillover +1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NF) alt, given</td>
<td>776.95 (17.49)</td>
<td>676.20 (10.40)</td>
<td>799.06 (11.58)</td>
<td>758.62 (10.83)</td>
<td>735.89 (17.40)</td>
</tr>
<tr>
<td>(NF) no alt, given</td>
<td>793.35 (16.33)</td>
<td>683.25 (9.66)</td>
<td>791.93 (14.13)</td>
<td>782.73 (13.58)</td>
<td>747.24 (13.06)</td>
</tr>
<tr>
<td>(NF) alt, new</td>
<td>811.27 (16.95)</td>
<td>711.83 (12.45)</td>
<td>901.01 (13.32)</td>
<td>793.31 (12.19)</td>
<td>713.45 (11.16)</td>
</tr>
<tr>
<td>(NF) no alt, new</td>
<td>909.15 (17.25)</td>
<td>772.62 (16.40)</td>
<td>968.70 (17.32)</td>
<td>876.82 (15.27)</td>
<td>835.61 (18.91)</td>
</tr>
</tbody>
</table>

As with Experiment 1, linear mixed effects regression models were fitted to both log-transformed and untransformed response times to target words. Models included fixed effects of newness and the presence or absence of alternatives, and random slopes and intercepts by both subjects and items. The absence of an alternative to the focused target word was treated as the baseline of this factor. Fixed effects estimates for the model fitted to log-transformed responses are reported in Table 7; those for the model fitted to untransformed responses are reported in Table 8.

### Table 7: Parameter values for fixed effects in mixed linear regression model of LogRTs in Experiment 2

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Std. Error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>6.64594</td>
<td>0.02132</td>
</tr>
<tr>
<td>Alternative</td>
<td>-0.02849</td>
<td>0.02232</td>
</tr>
<tr>
<td>Newness</td>
<td>0.10723</td>
<td>0.02257</td>
</tr>
<tr>
<td>Alternative:Newness</td>
<td>0.09016</td>
<td>0.02820</td>
</tr>
</tbody>
</table>

As in Experiment 1, the significant positive estimates for newness indicate that new targets were responded to more slowly than targets that were mentioned in the preceding question. Novel to Experiment 2, a significant interaction between newness and the presence of alternatives indicated that the difference in response times between the two new conditions was larger than the difference between the two given conditions. Pairwise comparisons on untransformed response times confirm...
that the effect of presence of alternatives does not reach significance in the given conditions ($t = .31$), while the difference between the new conditions with and without previously mentioned alternatives was significant ($t = -3.60$). Responses were thus slower in conditions without an alternative compared to those with an alternative only when the target was also new.

### 2.3 Discussion

Experiment 2 replicated the effect of newness found in Experiment 1: responses were slower when a target word was new compared to when it was given. This finding also replicated the results of eye-tracking while reading studies in which new information focus was found to cause significant slowdowns.

Experiment 2 also demonstrated that the effect of focus can be modulated by preceding contextual information. The slowdown for narrow foci was smaller when a preceding context mentioned an alternative expression to the target word. But this effect of explicitly providing an alternative in the context was only significant when the target itself was new. This suggests that either previously encountering the exact expression in focus or previously encountering an alternative to the focus
<table>
<thead>
<tr>
<th>Estimate</th>
<th>Std. Error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>803.153</td>
<td>19.503</td>
</tr>
<tr>
<td>Alternative</td>
<td>-3.699</td>
<td>24.699</td>
</tr>
<tr>
<td>Newness</td>
<td>94.717</td>
<td>22.865</td>
</tr>
<tr>
<td>Alternative:Newness</td>
<td>86.692</td>
<td>34.821</td>
</tr>
</tbody>
</table>

Table 8: Parameter values for fixed effects in mixed linear regression model of untransformed RTs in Experiment 2

Experiment 2 aids in comprehending the focus itself.

Experiment 2 made use of the focus particle *only* as a focusing device, but much of the previous literature has used clefts (see Table 1). To make a more direct comparison with those previous findings, Experiment 3 employed the same manipulations as Experiment 2, except that the target sentence of Experiment 3 contained a cleft instead of a focus particle.

### 2.4 Experiment 3

The crucial difference between Experiment 2 and Experiment 3 is that in the latter, an *it*-cleft was used to put the target word in focus, instead of the focus particle *only*.

#### 2.4.1 Method

**Participants** 53 native speakers of English were recruited via Prolific. Data from 48 participants were included in the analysis; 5 participants were excluded because they failed to complete more than 70% of the Maze sentences.

**Materials** The items of Experiment 3 consisted of modified versions of those of Experiment 2. An example of an item is in (32), below.

(32) **Speaker A:** This company often makes bad decisions, but...

   a. Did they hire a [lawyer] last fall, or an [accountant]? (NF) alt, given
   b. Did they hire a [lawyer] last fall? (NF) no alt, given
   c. Did they hire an [accountant] last fall? (NF) alt, new
d. What did they announce last time?  

Speaker B: I think they announced it was a lawyer that they hired, but I’m not sure.

As in Experiment 2, the preceding context questions of Experiment 3 manipulated whether an alternative to the expression in focus was either mentioned or not (alt vs. no alt) and whether the focus itself was previously mentioned or not (given vs. new). Like the focus particle only, the cleft structure (it was a...) caused all target words in all conditions of Experiment 3 to be unambiguously narrow focused.

Besides replacing only with a cleft, another difference in the target sentences between Experiment 3 and Experiment 2 was that the phrase that previously functioned as a short spill-over region (last fall in Experiment 1 and Experiment 2) was removed from the target sentence in Experiment 3 to make the target sentence slightly shorter and more natural.

All materials of Experiment 3 were first assessed in an acceptability judgment study. The results of this norming study can be found in Appendix I, Section 4.3.

Fillers, practice items, and comprehension questions were the same as in the previous two studies.

Procedure  As in Experiment 2 and Experiment 1, target sentences were implemented in the Maze task. Maze materials for Experiment 3 were independently generated using the AutoMaze algorithm, with the result that the foils in this experiment were not directly based on those generated for Experiment 1 and Experiment 2. This was necessary, because the target sentences in Experiment 3 are of a different structure from the target sentences in Experiment 1 and Experiment 2. For this same reason, a direct comparison between response times obtained in these experiments and those from Experiment 3 would not have been possible regardless of the way in which the foils are generated.

2.4.2 Results

Mean response times for the target word and its surrounding regions in all conditions are presented in Table 9. They are plotted with 95% confidence intervals in Figure 3.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Previous -1</th>
<th>Previous</th>
<th>Critical region</th>
<th>Spillover</th>
<th>Spillover +1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NF) alt, given</td>
<td>691.65 (10.52)</td>
<td>681.21 (9.19)</td>
<td>823.68 (9.19)</td>
<td>680.58 (8.42)</td>
<td>670.26 (11.46)</td>
</tr>
<tr>
<td>(NF) no alt, given</td>
<td>697.15 (10.78)</td>
<td>693.09 (9.84)</td>
<td>877.81 (16.87)</td>
<td>683.79 (9.84)</td>
<td>678.52 (11.91)</td>
</tr>
<tr>
<td>(NF) alt, new</td>
<td>701.00 (11.80)</td>
<td>707.76 (10.44)</td>
<td>977.80 (16.66)</td>
<td>698.56 (9.43)</td>
<td>673.30 (10.68)</td>
</tr>
<tr>
<td>(NF) no alt, new</td>
<td>710.78 (11.44)</td>
<td>724.57 (10.59)</td>
<td>1160.42 (22.56)</td>
<td>736.85 (9.96)</td>
<td>736.54 (12.81)</td>
</tr>
</tbody>
</table>

Table 9: Experiment 3: mean RT and standard error of the mean in each condition two words before, at, and two words after the target word.

Model structures were identical to those fitted for Experiment 2. Fixed effects estimates for the model fitted to log-transformed response times are reported in Table 10; those for the model fitted to untransformed response times are reported in Table 11.

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Std. Error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>6.65769</td>
<td>0.03370</td>
</tr>
<tr>
<td>Alternative</td>
<td>0.04607</td>
<td>0.02272</td>
</tr>
<tr>
<td>Newness</td>
<td>0.17234</td>
<td>0.02103</td>
</tr>
<tr>
<td>Alternative:Newness</td>
<td>0.11022</td>
<td>0.03919</td>
</tr>
</tbody>
</table>

Table 10: Parameter values for fixed effects in mixed linear regression model of LogRTs in Experiment 3.

Significantly positive estimates for newness again indicate a slowdown on new targets compared to targets that were mentioned in the previous question. Unlike Experiment 2, however, the models fitted to Experiment 3 find a small but significant effect of the presence of alternatives, indicating that foci were read faster in the presence of a contextual alternative than in the absence of one. Finally, a significant interaction between newness and the presence of alternatives was also found, suggesting that the difference in response times between the two new conditions was larger than the difference between the two given conditions. Again as in Experiment 2, pairwise comparisons on untransformed response times revealed that the effect of the presence of alternatives only...
reaches significance in the new conditions ($t = -4.72$), but not in the given conditions ($t = 2.03$).

### 2.4.3 Discussion

Experiment 3 replicated the newness effects reported above for both Experiment 1 and Experiment 2: In all experiments, responses were slower to new foci than given foci. Experiment 3 also replicated Experiment 2 in finding that the slowdown for new foci was smaller when a context mentioned an alternative expression to the target word. This suggests that for clefts, too, either previously encountering the expression in focus or previously encountering an alternative to the focus significantly helps in comprehending the focus itself.

### 3 General discussion

The results reported in this paper are in line with the findings reported by Benatar and Clifton (2014), Birch and Rayner (1997), Lowder and Gordon (2015), and Sloggett et al. (2019), which all found a processing cost for foci compared to non-foci. The results of Experiment 1, in particular, support this general conclusion, because longer response times were found on narrow focused...
words compared to words that were part of broad focused phrases.

However, unlike these previous studies, in the present experiments, focus was not confounded with newness. In Section 1.2, the newness/givenness opposition was explained as crucially orthogonal to the broad focus/narrow focus opposition, because foci do not have to be new and not all new material has to be put into narrow focus. The response time data reported in Experiment 1 showed that newness and focus are not only conceptually distinct, but also empirically separable in response times. That is, there was a positive effect on responses for new material, independently of a positive effect on responses for foci. In particular, Experiment 1 showed a focus slowdown even for foci that are given. This means that the focus slowdown itself cannot be explained in terms of newness alone.

Previous studies have also reported significant speed-ups for foci (Birch & Rayner, 2010; Morris & Folk, 1998). Crucially, however, the present results do not go against those reported by Morris and Folk (1998) and Birch and Rayner (2010), because the focus slowdown can be modulated by preceding linguistic context in two ways. First, Experiments 1-3 showed that the processing cost for foci is smaller when foci are previously mentioned compared to when they are completely new. Second, Experiment 2 and Experiment 3 showed that for new associated foci (as marked by focus particles and clefts), the focus effect is also significantly reduced if an alternative expression to the one in focus is mentioned in the preceding question. As outlined in Section 1.2, this finding is expected under the view adopted from the formal semantics literature in which the interpretation of focus is understood to be dependent on a contextually relevant set of alternatives.

The finding that it is information about alternatives to a focus that reduces the focus slowdown is also potentially compatible with the speed-ups reported by Birch and Rayner (2010) and Morris

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>826.99</td>
<td>31.93</td>
<td>25.901</td>
</tr>
<tr>
<td>Alternative</td>
<td>55.48</td>
<td>24.13</td>
<td>2.299</td>
</tr>
<tr>
<td>Newness</td>
<td>157.85</td>
<td>23.82</td>
<td>6.627</td>
</tr>
<tr>
<td>Alternative:Newness</td>
<td>128.39</td>
<td>44.78</td>
<td>2.867</td>
</tr>
</tbody>
</table>

Table 11: Parameter values for fixed effects in mixed linear regression model of untransformed RTs in Experiment 3.
and Folk (1998). Both Birch and Rayner (2010) and Morris and Folk made use of materials which explicitly mentioned an alternative to the expression in focus, just as in the “alt” conditions of the present studies. Since the target region for both of Morris and Folk’s and Birch and Rayner’s (2010) studies was never previously mentioned, the conditions that they used are comparable to the NF new and BF new conditions of the present Experiment 1, which also contained and did not contain a previously mentioned alternative to the target word, respectively. In the present Experiment 2, the (NF) alternative-mentioned new conditions showed a significant reduction in response times compared to the (NF) no-alternative-mentioned new conditions, such that response times in the (NF) alternative-mentioned new condition of Experiment 2 even became numerically lower than in the BF (no-alternative-mentioned) new condition of Experiment 1. It is conceivable that the focus speed-up found by Birch and Rayner (2010) and Morris and Folk was similar to this one. It may thus be the case that such a speed-up can only be observed if alternatives to a focused expression are explicitly mentioned, which was not the case in any of the other studies on focus in reading. Such a speed-up could occur if the presence of alternatives to a focus allows readers to better anticipate which expression will eventually be in focus from earlier on during the course of reading a sentence. Successful anticipation of this kind could then perhaps lead to speed-ups on foci themselves.

However, the present studies found that previous mention of an alternative did not have the same effect on given foci as observed for new foci: when the focus itself was given, there was no difference between the alternative-mentioned and the no-alternative-mentioned conditions. In other words, either encountering the target word itself, or encountering an alternative to the target word, was apparently enough to obviate the focus effect. If this effect is indeed due to the fact that participants had to accommodate information about the set of relevant alternatives during the interpretation of a focus, this would mean that encountering the target word itself helps the reader in establishing the alternative set, too.

One reason for this might be that the first encounter of a target word already semantically primes words that are semantically associated (that is, in the conceptual sense, not in the sense of associated foci) with that target. If a set of contextually relevant alternatives is found by performing a search through memory, the process of establishing such a set might be completed faster if potential members of this set are still activated by being primed by the target word itself. Alterna-
tively, priming of semantic associates by the target could also lead to a faster identification of the alternative set if pre-activation on semantic associates is generally used to establish the alternative set.

Turning to a different issue, the attenuation of the focus slowdown when alternatives were explicitly mentioned was only observed for associated foci. In Experiment 1, the narrow foci necessarily occurred in a context in which an explicit alternative was mentioned, but a significant slowdown nonetheless occurred on these compared to words that were part of a broad-focused phrase. This may indicate an important difference between the ways in which free and associated foci are processed. For free foci, there is no explicit focus construction that comes with its own additional inferences. Free and associated foci may therefore be processed differently, because free foci do not induce the same additional tasks as were discussed for associated foci in the introduction.

The apparent difference between free and associated foci does mean, however, that the results of Experiment 2 and Experiment 3 do not necessarily provide any conclusive evidence as to why the focus slowdown occurs for free foci, as well, because the mechanisms responsible for this might be different than the ones at work in associated foci. One potential explanation for the free focus slowdown is that it is due to the fact that free focus itself needs to be located and identified on the basis of far less informative cues than associated foci. This may be particularly costly in the case of free foci, because unlike the associated foci used in Experiment 2 and Experiment 3, the location of the foci in Experiment 1 was not explicitly marked by a specific construction such as a particle or cleft.

As mentioned in Section 1, self-paced reading studies reported by Fraundorf et al. (2013) also showed slowdowns on foci that occurred in the presence of explicit contextual alternatives. However, in Fraundorf et al.’s materials foci were marked using font emphasis and there crucially was no explicit focusing device that signalled the presence of the upcoming focus. These studies may therefore have yielded diverging results from ours because of this difference between free and associated foci. Moreover, the use of font emphasis to mark focus may have yielded different reading profiles than the current ones independently of the presence of a particle or cleft.

Much is still unknown about the process of focus comprehension. How and when in incremental parsing do readers determine which material is put into focus by a focusing device like a
particle or cleft? And how exactly do readers arrive at the relevant alternative set for such associated foci? How is this information incorporated into the sentence as a whole? Future work is needed to establish what mechanism is used by readers to perform any of these tasks.

In short, although the present studies demonstrated an overall slowdown in response times for foci compared to non-foci—in line with the focus slowdown reported by [Benatar & Clifton, 2014; Birch & Rayner, 1997; Lowder & Gordon, 2015; Sloggett et al., 2019]—this focus slowdown was modulated by context. The explanation for the focus slowdown cannot be found in the role of newness alone. Most importantly, when alternatives to foci were contextually mentioned, the slowdown on new foci was significantly reduced. This suggests that presenting information about alternatives aids reading of foci, thus providing converging evidence for the role of alternatives in focus processing with work from other methods ([Fraundorf et al., 2013, 2010; Gotzner et al., 2016; Husband & Ferreira, 2015]. Controlling for newness versus focus and contextual mention of alternatives also clarifies the earlier eye-tracking while reading results: previous work only found a focus speed-up after contextual mention of alternatives with no newness contrast between foci and baselines, and only found a slowdown in the absence of alternatives. This relied on a conceptualization of focus as an abstract category that assumes that the interpretation of a focus is dependent on its context, but not on newness of the expression in focus itself.

References


4 Appendix I: Offline acceptability ratings

The offline acceptability judgment studies discussed in this section aimed to establish the extent to which the materials used in the Maze task online reading studies were considered natural by native speakers of English. To that end, Experiments A.1-3 use the same stimulus and filler materials as Experiments 1-3. Since reduced acceptability ratings have been shown repeatedly to provide an indication of a significant processing cost, these offline studies also provided preliminary and convergent evidence for potential focus costs.

Participants were from the same population as Experiments 1-3 and recruited in the same way. Sentences were presented using the Ibex Farm platform for web-based experiments (Drummond, 2013).

In each trial, participants read a full dialogue on a single screen and were asked to judge the naturalness of the full discourse on a 4-point Likert scale. The practice items provided guided feedback to make sure participants were familiar with the use of the scale.

All of the studies reported here were analyzed with mixed effects ordinal regression models fitted to the rating data using the clmm function of the ordinal package in R (R Core Team, 2007; Christensen, 2019). All fixed and random effects structures parallel those used for the Maze studies, unless otherwise noted.
4.1 Experiment A.1

(33) **Speaker A:** This company often makes bad decisions, but...

a. Did they hire a [lawyer] last fall, or an [accountant]?  
   NF (alt), given

b. Did they hire a [lawyer] last fall?  
   BF (no alt), given

c. Did they hire an [accountant] last fall?  
   NF (alt), new

d. What did they announce last time?  
   BF (no alt), new

**Speaker B:** I think they announced they hired a [lawyer] last fall, but I’m not sure.

This acceptability rating study also aimed to establish whether, in the NF given condition as in (33a), the eventual target word was considered a natural alternative expression to the alternative mentioned the preceding question and vice versa. If the target and the alternative expression were indeed proper alternatives to each other, it would be expected that it would not matter which one was mentioned in the question and which one was mentioned in the target sentence. In Experiment A.1, both the intended question/answer pairs and the question/answer pair in which the position of the target and the alternative expression were switched were tested.

The identity of target and alternative expression was treated as a between-subjects manipulation: one group of participants (n=48) were presented with the set of items that were be used in our reading studies, while a second group of participants (n=48) were presented with the version of all the items that had the target and the contextual alternatives switched.

In a separate model, the identity of the target word, again with two levels, was added as a between-subjects fixed effect. A t-value of 2 will be considered to be the critical value for significance. The broad focus and given conditions were treated as baselines throughout.

4.2 Experiment A.2

(34) **Speaker A:** This company often makes bad decisions, but...

a. Did they hire a [lawyer] last fall, or an [accountant]?  
   (NF) alt, given

b. Did they hire a [lawyer] last fall?  
   (NF) no alt, given

c. Did they hire an [accountant] last fall?  
   (NF) alt, new
Table 12: Experiment A.1: mean rating and standard error of the mean by condition and by target and contextual alternatives.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target Identity</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>z value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NF (alt), given</td>
<td>alt1</td>
<td>3.34</td>
<td>0.043</td>
<td></td>
</tr>
<tr>
<td></td>
<td>alt2</td>
<td>3.30</td>
<td>0.055</td>
<td></td>
</tr>
<tr>
<td>BF (no alt), given</td>
<td>alt1</td>
<td>3.29</td>
<td>0.035</td>
<td></td>
</tr>
<tr>
<td></td>
<td>alt2</td>
<td>3.27</td>
<td>0.050</td>
<td></td>
</tr>
<tr>
<td>NF (alt), new</td>
<td>alt1</td>
<td>3.10</td>
<td>0.039</td>
<td></td>
</tr>
<tr>
<td></td>
<td>alt2</td>
<td>3.03</td>
<td>0.059</td>
<td></td>
</tr>
<tr>
<td>BF (no alt), new</td>
<td>alt1</td>
<td>3.10</td>
<td>0.038</td>
<td></td>
</tr>
<tr>
<td></td>
<td>alt2</td>
<td>2.81</td>
<td>0.70</td>
<td></td>
</tr>
</tbody>
</table>

Table 13: Parameter values for fixed effects in mixed ordinal regression model of acceptability judgments in Experiment A.1

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>z value</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>-0.8658</td>
<td>0.1515</td>
<td>-5.716</td>
</tr>
<tr>
<td>Focus</td>
<td>-0.3615</td>
<td>0.1707</td>
<td>-2.118</td>
</tr>
<tr>
<td>New:Focus</td>
<td>0.5338</td>
<td>0.2539</td>
<td>2.102</td>
</tr>
</tbody>
</table>

d. What did they announce last time? (NF) no alt, new

Speaker B: I think they announced they hired only a lawyer last fall, but I’m not sure.

The same between-subjects manipulation of target identity was used as in Experiment A.1 to investigate the effect of the specific lexical material making up the target and the alternative expressions.

In the model including the between-subjects manipulation of target identity, the main effect of target identity did not reach significance ($z = 0.65$). However, this model revealed a significant three-way interaction between target identity, presence of an alternative and newness ($z = -2.55, p < 0.05$). Again, this indicates that acceptability judgments for items with alt2 as
the target were only significantly lower than items with alt1 as the target in the (NF) no alt, new condition ($z = -2.989$, $p < 0.05$ after Bonferroni correction for multiple comparisons).

4.3 Experiment A.3

(35) Speaker A: This company often makes bad decisions, but...

a. Did they hire a [lawyer] last fall, or an [accountant]? (NF) alt, given
b. Did they hire a [lawyer] last fall? (NF) no alt, given
c. Did they hire an [accountant] last fall? (NF) alt, new
d. What did they announce last time? (NF) no alt, new

Speaker B: I think they announced it was a [lawyer] that they hired, but I’m not sure.

The data analysis was again analogous to that of Experiment A.2, except that it did not include a between-subjects fixed effects for target identity.
Figure 5: Experiment A.1: mean rating by alternative in each condition. Error bars represent the 95% confidence interval.

5 Appendix II: Materials

Materials for Experiment A.1 and Experiment 1 are given below. These materials were then adapted to create materials for the other experiments.

(1) **Context:** Abbie is a very picky eater.
   a. Did she want chocolate cake for dessert, or apple pie?  
   b. Did she want chocolate cake for dessert?  
   c. Did she want apple pie for dessert?  
   d. Do you remember what she said?

**Target:** I think Abbie said she wanted chocolate cake for dessert, but I’m not sure.

(2) **Context:** Ben is feeling very sick and we’re trying to figure out why.
   a. Did he eat pasta at the restaurant, or pizza?  
   b. Did he eat pasta at the restaurant?  
   c. Did he eat pizza at the restaurant?

**Target:**
Table 14: Experiment A.2: mean rating and standard error of the mean by condition and by target and contextual alternatives.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target Identity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(NF) alt, given</td>
<td>alt1 3.30 (0.033)</td>
<td>alt2 3.27 (0.047)</td>
</tr>
<tr>
<td></td>
<td>alt1 3.34 (0.048)</td>
<td>alt2 3.34 (0.048)</td>
</tr>
<tr>
<td>(NF) no alt, given</td>
<td>alt1 2.77 (0.039)</td>
<td>alt2 2.73 (0.056)</td>
</tr>
<tr>
<td></td>
<td>alt1 2.82 (0.053)</td>
<td>alt2 2.82 (0.053)</td>
</tr>
<tr>
<td>(NF) alt, new</td>
<td>alt1 3.19 (0.034)</td>
<td>alt2 3.12 (0.051)</td>
</tr>
<tr>
<td></td>
<td>alt1 3.26 (0.046)</td>
<td>alt2 3.26 (0.046)</td>
</tr>
<tr>
<td>(NF) no alt, new</td>
<td>alt1 3.04 (0.040)</td>
<td>alt2 2.89 (0.060)</td>
</tr>
</tbody>
</table>

Table 15: Parameter values for fixed effects in mixed ordinal regression model of acceptability judgments in Experiment A.2.

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>z value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newness</td>
<td>-0.3194</td>
<td>0.1460</td>
<td>-2.188</td>
</tr>
<tr>
<td>Alternative</td>
<td>-1.4143</td>
<td>0.1661</td>
<td>-8.516</td>
</tr>
<tr>
<td>Newness:Alternative</td>
<td>0.9407</td>
<td>0.2306</td>
<td>4.079</td>
</tr>
</tbody>
</table>

Target: I think I saw him eating pasta at the restaurant, but it could have been something else.

(3) **Context:** We need a few computers for the lab.

a. Did Charlie buy a desktop at the store, or a laptop? **NF (alt), given**

b. Did Charlie buy a desktop at the store? **BF (no alt), given**

c. Did Charlie buy a laptop at the store? **NF (alt), new**

d. What did Charlie tell you again? **BF (no alt), new**

Target: I think Charlie told me he bought a desktop at the store, although I could be wrong.
Figure 6: Experiment A.2: mean rating in each condition. Error bars represent the 95% confidence interval.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean Rating</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NF) alt, given</td>
<td>3.38</td>
<td>0.03</td>
</tr>
<tr>
<td>(NF) no alt, given</td>
<td>3.05</td>
<td>0.03</td>
</tr>
<tr>
<td>(NF) alt, new</td>
<td>3.27</td>
<td>0.03</td>
</tr>
<tr>
<td>(NF) no alt, new</td>
<td>2.86</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 16: Experiment A.3: mean rating and standard error of the mean by condition.

(4) **Context:** Dave had to get rid of a lot of his stuff.

a. Did he sell his washing machine when he moved out, or his dryer? NF (alt), given
b. Did he sell his washing machine when he moved out? BF (no alt), given
c. Did he sell his dryer when he moved out? NF (alt), new
d. What did he say about it? BF (no alt), new

**Target:** I believe he said he sold his washing machine when he moved out, but he didn’t tell his roommates.
Figure 7: Experiment A.2: mean rating by alternative in each condition. Error bars represent the 95% confidence interval.

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>z value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newness</td>
<td>-0.3790</td>
<td>0.1485</td>
<td>-2.552</td>
</tr>
<tr>
<td>Alternative</td>
<td>-0.9406</td>
<td>0.1503</td>
<td>-6.257</td>
</tr>
<tr>
<td>Newness:Alternative</td>
<td>-0.2012</td>
<td>0.2471</td>
<td>-0.815</td>
</tr>
</tbody>
</table>

Table 17: Parameter values for fixed effects in mixed ordinal regression model of acceptability judgments in Experiment A.3

(5) **Context:** I wonder how Erik is doing these days.

a. Does he have regrets from his previous marriage, or fond memories? NF (alt), given
b. Does he have regrets from his previous marriage? BF (no alt), given

c. Does he have fond memories from his previous marriage? NF (alt), new

d. What did he say the other day? BF (no alt), new

**Target:** I believe he said he has regrets from his previous marriage, but I’m not sure.

(6) **Context:** I’m looking for someone who can drop this off at work.
Figure 8: Experiment A.3: mean rating in each condition. Error bars represent the 95% confidence interval.

a. Are you going to the store today, or to the office? NF (alt), given
b. Are you going to the store today? BF (no alt), given
c. Are you going to the office today? NF (alt), new
d. What did you decide to do? BF (no alt), new

Target: I decided that I am going to the store today, but I might change my mind.

Context: I’m just trying to figure out the logistics for this weekend.

a. Are you dropping people off at the train station tomorrow afternoon, or at the bus stop? NF (alt), given
b. Are you dropping people off at the train station tomorrow afternoon? BF (no alt), given
c. Are you dropping people off at the bus stop tomorrow afternoon? NF (alt), new
d. What do you think? BF (no alt), new

Target: I think I will be dropping people off at the train station tomorrow afternoon, but I can pick
you up wherever.

1200 (8) **Context:** I don’t know what I should get.

a. Are you drinking beer tonight, or wine?      NF (alt), given
b. Are you drinking beer tonight?      BF (no alt), given
c. Are you drinking wine tonight?      NF (alt), new
d. What do you think?      BF (no alt), new

1205 **Target:** I think I will be drinking beer tonight, but I don’t know about the others.

1210 (9) **Context:** I wonder how the reimbursement process works.

a. Would it be better to pay with cash tomorrow, or with card?      NF (alt), given
b. Would it be better to pay with cash tomorrow?      BF (no alt), given
c. Would it be better to pay with card tomorrow?      NF (alt), new
d. What did Andrew say?      BF (no alt), new

**Target:** Andrew said it would be better to pay with cash tomorrow, although it doesn’t really matter.

1215 (10) **Context:** Do you remember,

a. did Faye order rice with her meal, or fries?      NF (alt), given
b. did Faye order rice with her meal?      BF (no alt), given
c. did Faye order fries with her meal?      NF (alt), new
d. what did Faye say just now?      BF (no alt), new

**Target:** I believe she said she ordered rice with her meal, but we should ask her when she’s back.

1220 (11) **Context:** Greg offered to help me move my stuff next weekend, but

a. does he drive a car these days, or a van?      NF (alt), given
b. does he drive a car these days?      BF (no alt), given
c. does he drive a van these days?      NF (alt), new
d. what did he say exactly?  BF (no alt), new

**Target:** I believe he said he drives a car these days, but I would give him a call.

(12) **Context:** I’m thinking of buying Hana a birthday present.

a. Has she been a fan of fantasy since her teenage years, or of science fiction?  
   NF (alt), given

b. Has she been a fan of fantasy since her teenage years?  
   BF (no alt), given

b. Has she been a fan of fantasy since her teenage years?  
   NF (alt), new

d. What did she say again?  
   BF (no alt), new

**Target:** I think she said she has been a fan of fantasy since her teenage years, but I’m not sure.

(13) **Context:** I’m not sure what to get at the supermarket.

a. Does Jonathan like vanilla as an ice cream flavor, or strawberry?  
   NF (alt), given

b. Does Jonathan like vanilla as an ice cream flavor?  
   BF (no alt), given

c. Does Jonathan like strawberry as an ice cream flavor?  
   NF (alt), new

d. What did Jonathan say before he left?  
   BF (no alt), new

**Target:** I remember that he said he likes vanilla as an ice cream flavor, although I could be wrong.

(14) **Context:** I might have left my stuff at Kate’s place after the event yesterday.

a. Did she find a jacket last night, or a sweater?  
   NF (alt), given

b. Did she find a jacket last night?  
   BF (no alt), given

c. Did she find a sweater last night?  
   NF (alt), new

d. What did she say again?  
   BF (no alt), new

**Target:** I think she said she found a jacket last night, but I would give her a call.
(15) **Context:** I’m trying to find out about the dietary restrictions of our guests.

a. Has Logan been allergic to peanuts ever since she was little, or to seafood?  
   NF (alt), given

b. Has Logan been allergic to peanuts ever since she was little?  
   BF (no alt), given

c. Has Logan been allergic to seafood ever since she was little?  
   NF (alt), new

d. What did Logan say last time?  
   BF (no alt), new

**Target:** I believe she said she has been allergic to peanuts ever since she was little, but I will double check.

(16) **Context:** We have to update your immunization record before we can proceed.

a. Were you vaccinated for tetanus recently, or for chicken pox?  
   NF (alt), given

b. Were you vaccinated for tetanus recently?  
   BF (no alt), given

c. Were you vaccinated for chicken pox recently?  
   NF (alt), new

d. What did your doctor say?  
   BF (no alt), new

**Target:** I think my doctor said I was vaccinated for tetanus recently, although I could be wrong.

(17) **Context:** I’m just wondering who made such a mess on this table.

a. Did Maria read a newspaper this morning, or a magazine?  
   NF (alt), given

b. Did Maria read a newspaper this morning?  
   BF (no alt), given

c. Did Maria read a magazine this morning?  
   NF (alt), new

d. What did Maria say?  
   BF (no alt), new

**Target:** I think she said she was reading a newspaper this morning, but I’m not sure.

(18) **Context:** I’m looking for some recommendations.
a. Does Tony like to listen to music while driving to work, or to a podcast?  
   NF (alt), given
b. Does Tony like to listen to music while driving to work?  
   BF (no alt), given
c. Does Tony like to listen to a podcast while driving to work?  
   NF (alt), new
d. What did Tony say again?  
   BF (no alt), new

**Target:** He said he usually likes to listen to music while driving to work, but he has horrible taste.

(19) **Context:** I’m trying to gauge his background knowledge.

a. Did he study biology in high school, or chemistry?  
   NF (alt), given
b. Did he study biology in high school?  
   BF (no alt), given
c. Did he study chemistry in high school?  
   NF (alt), new
d. What did he tell you?  
   BF (no alt), new

**Target:** I remember that he said he studied biology in high school, but you should ask him yourself.

(20) **Context:** Oliver really was an annoying kid.

a. Did he always make fun of his mother when he was younger, or of his sister?  
   NF (alt), given
b. Did he always make fun of his mother when he was younger?  
   BF (no alt), given
c. Did he always make fun of his sister when he was younger?  
   NF (alt), new
d. What did his dad say again?  
   BF (no alt), new

**Target:** I think his dad said he always made fun of his mother when he was younger, but it wasn’t too bad.
(21) **Context:** I wonder how your mom got the information.

a. Did she talk to a nurse at the hospital, or to a doctor? NF (alt), given
b. Did she talk to a nurse at the hospital? BF (no alt), given
c. Did she talk to a doctor at the hospital? NF (alt), new
d. What did she tell you? BF (no alt), new

**Target:** I believe she said she talked to a nurse at the hospital, but I might be mistaken.

(22) **Context:** I’m not sure what to bring tomorrow night.

a. Are you making a main dish for the dinner party, or a dessert? NF (alt), given
b. Are you making a main dish for the dinner party? BF (no alt), given
c. Are you making a dessert for the dinner party? NF (alt), new
d. What did you decide? BF (no alt), new

**Target:** I think I decided to make a main dish for the dinner party, but I’m not really a good cook.

(23) **Context:** What is your plan for tomorrow?

a. Is your dad coming over for lunch tomorrow, or for dinner? NF (alt), given
b. Is your dad coming over for lunch tomorrow? BF (no alt), given
c. Is your dad coming over for dinner tomorrow? NF (alt), new
d. What did your dad say? BF (no alt), new

**Target:** I think he said he is coming over for lunch tomorrow, but I will check.

(24) **Context:** I was thinking of buying some wool for Liz.

a. Is she knitting a scarf for her granddaughter, or socks? NF (alt), given
b. Is she knitting a scarf for her granddaughter? BF (no alt), given
c. Is she knitting socks for her granddaughter? NF (alt), new
d. What did she say yesterday? BF (no alt), new
Target: I think she said she is knitting a scarf for her granddaughter, but I will ask her again.

(25) Context: This road has been closed for quite a while now.

a. Are they building a bridge here, or a tunnel? NF (alt), given
b. Are they building a bridge here? BF (no alt), given
c. Are they building a tunnel here? NF (alt), new
d. What do you know about the situation? BF (no alt), new

Target: I think they are building a bridge here, but they will be done very soon.

(26) Context: I wonder if Rachel already knows about the recent divorce in her family.

a. Did she call her aunt last week, or her uncle? NF (alt), given
b. Did she call her aunt last week? BF (no alt), given
c. Did she call her uncle last week? NF (alt), new
d. What did she tell you last night? BF (no alt), new

Target: I think she said she called her aunt last week, but I don’t think she knows anything.

(27) Context: I’m not sure what is appropriate in this case.

a. Are you giving them money for their wedding, or a giftcard? NF (alt), given
b. Are you giving them money for their wedding? BF (no alt), given
c. Are you giving them a giftcard for their wedding? NF (alt), new
d. What do you think? BF (no alt), new

Target: I think I am giving them money for their wedding, but I might change my mind.

(28) Context: There was an accident on the highway.

a. Does Stephanie take the bus to school every day, or the train? NF (alt), given
b. Does Stephanie take the bus to school every day? BF (no alt), given
(29) **Context:** I haven’t heard anything yet.

| a. Did Dan receive a letter last month, or an email? | NF (alt), given |
| b. Did Dan receive a letter last month? | BF (no alt), given |
| c. Did Dan receive an email last month? | NF (alt), new |
| d. What did Dan tell you? | BF (no alt), new |

**Target:** He told me he received a letter last month, but you should just give them a call.

(30) **Context:** I’m not sure when we should have our new furniture delivered.

| a. Did you paint the walls this week, or the ceiling? | NF (alt), given |
| b. Did you paint the walls this week? | BF (no alt), given |
| c. Did you paint the ceiling this week? | NF (alt), new |
| d. What did you decide? | BF (no alt), new |

**Target:** I decided to paint the walls this week, and I hope to be done with the first floor next week.

(31) **Context:** I must be going deaf!

| a. Did you hear the door bell just now, or the microwave? | NF (alt), given |
| b. Did you hear the door bell just now? | BF (no alt), given |
| c. Did you hear the microwave just now? | NF (alt), new |
| d. What did you say? | BF (no alt), new |

**Target:** I said I heard the door bell just now, but I might be wrong.

(32) **Context:** I’m updating the roster.

| a. Did Tom choose to write a paper for this class, or to take the exam? | NF (alt), given |
b. Did Tom choose to write a paper for this class? BF (no alt), given

c. Did Tom choose to take the exam for this class? NF (alt), new

d. What did Tom say? BF (no alt), new

Target: I think Tom said he chose to write a paper for this class, but he could change his mind.

(33) Context: We should find a place to stay for next weekend.

a. Is Caroline renting a house in the city, or an apartment? NF (alt), given

b. Is Caroline renting a house in the city? BF (no alt), given

c. Is Caroline renting an apartment in the city? NF (alt), new

d. Do you remember what Caroline said? BF (no alt), new

Target: I remember Caroline said she is renting a house in the city, but we should ask her again.

(34) Context: We’re almost done with the side dishes, but

a. did Vera cut up cucumbers for the salad, or tomatoes? NF (alt), given

b. did Vera cut up cucumbers for the salad? BF (no alt), given

c. did Vera cut up tomatoes for the salad? NF (alt), new

d. what did Vera say? BF (no alt), new

Target: I think Vera said she cut up cucumbers for the salad, although it doesn’t really matter.

(35) Context: Wendy is not allowed to watch everything.

a. Did she watch a sitcom yesterday, or a documentary? NF (alt), given

b. Did she watch a sitcom yesterday? BF (no alt), given

c. Did she watch a documentary yesterday? NF (alt), new

d. What did she tell you? BF (no alt), new

Target: I believe she said she watched a sitcom yesterday, but I’m not sure.

(36) Context: Something is different here!

a. Did Saul move the table to the other side of the room, or the sofa?
b. Did Saul move the table to the other side of the room? BF (no alt), given

c. Did Saul move the sofa to the other side of the room? NF (alt), new

d. What did Saul say? BF (no alt), new

**Target:** He said he moved the table to the other side of the room, although I’m not sure if I like it.

(37) **Context:** This company often makes the wrong decisions.

a. Did they hire a lawyer last fall, or an accountant? NF (alt), given

b. Did they hire a lawyer last fall? BF (no alt), given

c. Did they hire an accountant last fall? NF (alt), new

d. What did they announce this time? BF (no alt), new

**Target:** I think they announced that they hired a lawyer last fall, but I might be wrong.

(38) **Context:** What are you doing for the holidays?

a. Are you celebrating new year’s with family this year, or with friends? NF (alt), given

b. Are you celebrating new year’s with family this year? BF (no alt), given

c. Are you celebrating new year’s with friends this year? NF (alt), new

d. What did you decide? BF (no alt), new

**Target:** I decided I will celebrate new year’s with family this year, but I might change my mind.

(39) **Context:** I’m making the same recipe as Zara did last time.

a. Did she use basil for the sauce, or parsley? NF (alt), given

b. Did she use basil for the sauce? BF (no alt), given

c. Did she use parsley for the sauce? NF (alt), new

d. What did she say? BF (no alt), new

**Target:** She said she used basil for the sauce, although I could be wrong.
40) **Context:** The police are trying to find out how the burglar got in.
   a. Did Amanda close the door when it got cold, or the window?  
      NF (alt), given
   b. Did Amanda close the door when it got cold?  
      BF (no alt), given
   c. Did Amanda close the window when it got cold?  
      NF (alt), new
   d. What did Amanda tell them?  
      BF (no alt), new

**Target:** I think she said she closed the door when it got cold, but she didn’t lock it.

41) **Context:** I’m making Bill’s schedule right now.
   a. Is he teaching on Tuesdays this quarter, or on Wednesdays?  
      NF (alt), given
   b. Is he teaching on Tuesdays this quarter?  
      BF (no alt), given
   c. Is he teaching on Wednesdays this quarter?  
      NF (alt), new
   d. What did he tell you?  
      BF (no alt), new

**Target:** I believe he said he will be teaching on Tuesdays this quarter, but I’m not sure.

42) **Context:** I don’t know what the weather will be like.
   a. Should I wear shorts today, or jeans?  
      NF (alt), given
   b. Should I wear shorts today?  
      BF (no alt), given
   c. Should I wear jeans today?  
      NF (alt), new
   d. What do you think?  
      BF (no alt), new

**Target:** I think you should wear shorts today, but you should decide for yourself.

43) **Context:** I wonder if we have all the ingredients already.
   a. Do you still need milk for this recipe, or eggs?  
      NF (alt), given
   b. Do you still need milk for this recipe?  
      BF (no alt), given
   c. Do you still need eggs for this recipe?  
      NF (alt), new
   d. What do you think?  
      BF (no alt), new
Target: I think we still need milk for this recipe, but I will check the fridge.

(44)  

Context: I’m trying to decide if I should make a reservation.

a. Would you like to sit in the back during the show, or in the front?  
   NF (alt), given

b. Would you like to sit in the back during the show?  
   BF (no alt), given

c. Would you like to sit in the front during the show?  
   NF (alt), new

d. What do you think?  
   BF (no alt), new

Target: I think I would like to sit in the back during the show, but you don’t have to make a reservation.

(45)  

Context: What was going on?

a. Was Jack looking for his wallet in the car, or for his keys?  
   NF (alt), given

b. Was Jack looking for his wallet in the car?  
   BF (no alt), given

c. Was Jack looking for his keys in the car?  
   NF (alt), new

d. What did Jack tell you?  
   BF (no alt), new

Target: I think he said he was looking for his wallet in the car, but he didn’t find anything.

(46)  

Context: We’re trying to give away the leftovers.

a. Did Claire bring the roasted vegetables to the potluck, or the fruit salad?  
   NF (alt), given

b. Did Claire bring the roasted vegetables to the potluck?  
   BF (no alt), given

c. Did Claire bring the fruit salad to the potluck?  
   NF (alt), new

d. What did Claire say?  
   BF (no alt), new

Target: I believe she said she brought the roasted vegetables to the potluck, but we should ask her again.

(47)  

Context: Yesterday the jewelry store was held up.
a. Did the thief steal a bracelet from the store, or a necklace?  
   NF (alt), given

b. Did the thief steal a bracelet from the store?  
   BF (no alt), given

c. Did the thief steal a necklace from the store?  
   NF (alt), new

d. What did your hear about it?  
   BF (no alt), new

**Target:** I heard that they stole a bracelet from the store, and it wasn’t a very expensive one.

(48)  **Context:** We already did a lot of chores today!

a. Did Dean do the dishes this morning, or the laundry?  
   NF (alt), given

b. Did Dean do the dishes this morning?  
   BF (no alt), given

c. Did Dean do the laundry this morning?  
   NF (alt), new

d. What did Dean tell you?  
   BF (no alt), new

**Target:** He said he did the dishes this morning, but I’m not sure.