

# Operationalizing focus-sensitivity in a cross-linguistic context

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## Abstract

A number of analyses of clause-embedding predicates make crucial reference to the notion of *focus-sensitivity* (e.g., Villalta, 2008; Romero, 2015; Uegaki and Sudo, 2019; Wehbe and Flor, 2022). However, there are challenges associated with the construction of a concrete empirical test for focus-sensitivity which can be applied to any arbitrary predicate in a cross-linguistic setting. In this paper, we critically examine the generality and cross-linguistic applicability of three types of empirical tests for focus-sensitivity: a truth-based test, a coherence-based test, and an entailment-based test. We conclude that the entailment-based test is the most suitable one as a general diagnostic for focus-sensitivity in a cross-linguistic investigation. We also discuss the results of applying the entailment-based test to a small sample of predicates in English and Spanish, highlighting in particular that more predicates are focus-sensitive according to the test than has been assumed in previous work.

## 1 Introduction

It has been long known that certain lexical items and constructions, such as *only*, adverbs of quantification, *because*-clauses and counterfactuals, are focus-sensitive, in that the position of the prosodic focal accent—marked in capitals—affects the truth-conditions of the sentences that host them (Jackendoff, 1972; Rooth, 1985, a.o.). Leaving aside whether these focus-sensitive items associate conventionally or non-conventionally with focus (Beaver and Clark, 2007), one can easily construct a truth value judgment (TVJ) test to detect a focus-driven meaning difference in these cases: In scenario (1), sentence (1a) is judged true whereas sentence (1b) is not; similarly, scenario (2) makes sentence (2a) true but not sentence (2b) (Rooth, 1996):

- (1) Scenario: John introduced Bill and Tom to Sue (and did nothing else).
  - a. John only introduced Bill to SUE<sub>F</sub>. TRUE
  - b. John only introduced BILL<sub>F</sub> to Sue. NOT TRUE
- (2) Scenario: In Saint Petersburg, if an officer escorted somebody, it was a ballerina. Ballerinas could be escorted by officers or by opera employees.
  - a. In Saint Petersburg, officers always escorted BALLERINAS<sub>F</sub>. TRUE
  - b. In Saint Petersburg, OFFICERS<sub>F</sub> always escorted ballerinas. NOT TRUE

The present paper is concerned with a class of expressions whose potential focus-sensitivity has been much less explored, namely the class of attitude verbs. Dretske (1972) noted that the truth of a sentence with an attitude verb like *advise* depends on the exact location of the focal accent within its complement clause, as in (3):

- (3) a. Alex advised Clyde to sell his car to Schulz [for \$30000]<sub>F</sub>.  
b. Alex advised Clyde to sell his car to [SCHULZ]<sub>F</sub> [for \$30000].

For certain attitude verbs, it is relatively easy to see what ingredients of the context need to be manipulated to obtain a focus-based meaning contrast. However, as we will see, this proves to be a difficult task for some other attitude verbs. Recent developments in the study of attitude verbs make it highly desirable to define a focus-sensitivity test that is easily constructed and broadly applicable. These developments concern, on the

one hand, the investigation of the meaning of attitude verbs per se and, on the other, correlations between semantic properties of attitude verbs and their selectional restrictions.

In terms of the semantics of attitude verbs per se, recent efforts strive to uncover the core meaning components of these verbs in order to offer more refined and adequate lexical entries (e.g., Djärv (to appear) on *know* and *believe*, Özyıldız (2021) on *think*, White and Rawlins (2018a) on *decide*, among others). Focus is one such meaning component, claimed to play a crucial role in the inherent semantics of certain attitude verbs (Dretske (1972), Villalta (2008), Romero (2015), Uegaki and Sudo (2019), Wehbe and Flor (2022), a.o.). We will briefly examine this and other potential cases of focus affecting the literal meaning of attitude verbs in section 4.

In terms of semantic properties and selectional restrictions, a growing body of research investigates correlations between inherent semantic properties of attitude verbs and restrictions on the clause types and sub-types they select (e.g., Saebø 2007 and Egré 2008 on declarative/interrogative clause selection and veridicality in cognitive verbs, Zuber 1982, Theiler et al. 2019 and Mayr 2019 on neg-raising and lack of interrogative clause selection). Again, some of these generalizations and their concomitant analyses crucially involve focus-sensitivity of the attitude predicate. Here we mention the following three.

A first generalization, due to Villalta (2008), concerns subjunctive mood in complement clauses:

- (4) In Spanish, all attitude verbs that select subjunctive mood in their complement clause are focus-sensitive. (Villalta, 2008, 495)

Having a test that is widely applicable over languages allow us to test this generalization for other languages, e.g., in the Romance family and beyond. Additionally, note that Villalta’s generalization is uni-directional: While all subjunctive-selecting predicates are said to be focus-sensitive, it leaves open whether *all* focus-sensitive verbs select subjunctive or *only some*. Having a test that is widely applicable over predicates allows to identify different sub-classes of focus-sensitivity verbs that can then be tested for mood selection.

A second generalization concerns factive emotive verbs like *surprise* and *disappoint*, given in (5). Romero (2015) proposes to derive this ban from the interaction of focus-sensitivity and certain presupposition concerning the comparison class C:

- (5) Factive emotive verbs allow wh-questions but disallow alternative questions and polar questions as their complements. (Grimshaw, 1979; Lahiri, 1991; Guerzoni, 2007)

Again, a general focus-sensitivity test is necessary to test whether generalization (5) and focus-sensitivity go hand-in-hand cross-linguistically.

A third hypothesized generalization concerns non-factive preferential predicates like *hope*, in (6). Using the notion of L-analyticity (Gajewski, 2002), Uegaki and Sudo (2019) derive the ungrammaticality of e.g. *\*John hopes who jumped* from the combination of focus-sensitivity, certain presuppositions on the comparison class C and the non-factive semantics of the predicate.

- (6) All non-factive preferential predicates are anti-rogative, i.e., they do not take interrogative complements. (Uegaki and Sudo, 2019)

Once again, we need to have a general test for focus sensitivity in order to evaluate this generalization at the scale of the lexicon.<sup>1</sup>

All in all, we see that, in order to correctly carve the meaning of a given attitude verb in a given language and in order to test the soundness of selectional generalizations crosslinguistically, a broadly applicable focus-sensitivity is needed.<sup>2</sup>

The aim of the present paper is twofold.

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<sup>1</sup>White (2021) uses large-scale experimental data and corpus examples to challenge the validity of several existing generalizations concerning the relation between the semantic and selectional properties of a clause-embedding predicate. In the case of Uegaki and Sudo’s generalization, White only provides several putative counterexamples from corpora as there is no large-scale dataset measuring focus sensitivity (presumably due to the lack of a general test for focus sensitivity).

<sup>2</sup>To test for focus sensitivity in a given language, one must independently know how focus is marked in that language. We rely on prosodic marking of focus, but the tests that we survey here, including the one that we propose, should be applicable regardless of how focus is marked, so long as potential confounds (like additional inferences triggered by clefts) are controlled for.

Our first, main goal is to find an optimal focus-sensitivity test that can be broadly applied to arbitrary attitude predicates in arbitrary languages. To this end, we consider three different ways of testing for focus-sensitivity. Two of these come from Villalta (2008) and have been used elsewhere in the literature: One relies on truth value judgments (TVJ) and the other on judgments of coherence and contradiction. The third one, inspired by an observation in Dretske (1972), is the main contribution of this paper and is based on judgments of entailment. We highlight potential confounds that any test for focus sensitivity might face and the difficulties that arise when they are extended to different kinds of predicates across different languages, and argue that our entailment-based test emerges as the best candidate.

A second goal is to report on the results of applying our entailment based test to a selection of attitude predicates in English and Spanish. In doing so, we find that, while all non-focus-sensitive predicates in the literature remain non-focus-sensitive, more attitude verbs turn out to be focus-sensitive than previously noted. Furthermore, the detected focus-sensitive predicates cluster into (at least) three categories: gradable verbs like *want*, QUD sensitive verbs like *answer*, and change of state verbs like *decide*. We sketch out ways of building focus sensitivity into the meaning of the latter two classes of predicates.

The paper is structured as follows. Section 2 presents the TVJ test and the coherence test from the literature and discusses their practical shortcomings. Section 3 introduces the proposed entailment-based test. In section 4, we turn to our preliminary results of applying the entailment-based tests to English and Spanish. Section 5 concludes.

## 2 Different tests for focus sensitivity and their issues

### 2.1 Truth-based test

**The original formulation of the truth value judgment test** Our starting point is a truth value judgment task used as a focus sensitivity test by Villalta (2008: sec. 7.1) as well as Romero (2015) and Uegaki and Sudo (2019). To test whether a given predicate is focus sensitive, two string identical sentences are constructed, which differ in the position of a narrow focused constituent in an embedded clause. Example (7) illustrates two target sentences for ‘want.’<sup>3</sup>

- (7) a. Lisa wants John to teach syntax ON TUESDAYS AND THURSDAYS.  
 b. Lisa wants JOHN to teach syntax on Tuesdays and Thursdays.

The truth of these sentences is judged in a context that constrains their relevant focus alternatives such as (8a), and that specifies relevant aspects of the attitude that the matrix subject bears to the embedded proposition, e.g., their preferences and beliefs, in (8b). The context in (8a) and (8b) is the one given by Villalta for the non-veridical preferential ‘want,’ which we separate into ‘broad’ and ‘immediate’ for expository purposes.<sup>4</sup>

- (8) a. **Broad context**

In the linguistics department, at the faculty meeting, the teaching schedules of the different faculty members for the upcoming semester are discussed. There is only one syntactician in the department (John), one phonologist (Lisa), and two semanticists (Lara and Frank). John can only teach syntax. Lara can teach syntax and semantics. There is some controversy on which days John should teach his syntax classes. There are two options: he may teach syntax on Tuesdays and Thursdays, or he may teach syntax on Mondays, Wednesdays and Fridays.

<sup>3</sup>The constituent “on Tuesdays and Thursdays” is also where main sentential stress projects from, and where it is expected to fall in broad(er) focus contexts (Selkirk 1996, a.o.). This might make it difficult to tell exactly when this particular constituent is in narrow focus. Villalta does not address this confound, and neither will we. But, to the best of our ability to tell, placing narrow focus on a constituent where it cannot project from (like “syntax”), does not affect the results that we report on here.

<sup>4</sup>A veridical predicate entails, and a factive predicate presupposes its propositional complement. We subscribe to the view that emotive predicates like ‘be glad’ presuppose their complement in ordinary contexts, as opposed to merely presupposing that their subject believes the complement (Klein 1975, a.o.). This is relevant because it affects whether the embedded proposition should be made true by the context given or not. This original context does not explicitly state that it is decided that John will teach syntax and that Lisa knows this, but this is implicit in “But given that John has to teach syntax, she prefers it if. . .” In other words, the context is such that Lisa truthfully believes that John will teach syntax. It is not required that the belief be truthful for ‘want,’ but for factive predicates like ‘be glad,’ it is.

b. **Immediate context**

Lisa’s preferences are the following: she would prefer it if Lara would teach syntax rather than John. But given that John has to teach syntax, she prefers it if he teaches on Tuesdays and Thursdays rather than on Mondays, Wednesdays and Fridays (because she wants the teaching slot on Mondays, Wednesdays and Fridays for her own phonology class, which cannot conflict with the syntax class).

c. **Target sentences**

- (i) Lisa wants John to teach syntax ON TUESDAYS AND THURSDAYS. TRUE
- (ii) Lisa wants JOHN to teach syntax on Tuesdays and Thursdays. NOT TRUE

In the context given, (8ci) is judged true, while (8cii) is judged not to be true.<sup>5</sup> This suggests that the position of focus under the scope of ‘want’ gives rise to truth conditional differences, which motivates the conclusion that ‘want’ is a focus sensitive predicate. (We will shortly see predicates under which the position of focus does *not* give rise to truth conditional differences.)

Predicates with different properties will require that the context be modified in different ways. For example, for the factive preferential ‘be glad,’ we have to assume, citing Villalta, that “at the end of the faculty meeting, *it is decided that* John is indeed going to teach syntax on Tuesdays and Thursdays” (compare with “There is some controversy...” above). This is to satisfy the requirement that the complement of ‘be glad’ is presupposed.

- (9) a. Lisa is glad that John teaches syntax ON TUESDAYS AND THURSDAYS.
- b. Lisa is glad that JOHN teaches syntax on Tuesdays and Thursdays.

Given Lisa’s preferences as specified in (8b), here too, (9a) is judged true and (9b) not true, motivating the conclusion that ‘be glad’ is a focus-sensitive predicate.

Villalta contrasts the situation with ‘want’ and ‘be glad’ with the factive doxastic predicate ‘know.’ About the pair of sentences in (10), she writes that “[they] are both true under the same circumstances: all contexts that make one of them true make the other true as well.” (That is, each sentence entails the other, which amounts to saying that the sentences are truth conditionally equivalent.)

- (10) a. Lisa knows that John teaches syntax ON TUESDAYS AND THURSDAYS.
- b. Lisa knows that JOHN teaches syntax on Tuesdays and Thursdays.

Because the position of focus under the scope of ‘know’ is not perceived to give rise to a truth conditional difference, the predicate is classified as non-focus-sensitive. A larger list of predicates, classified in terms of whether they are focus sensitive or not according to Villalta’s judgment, is found in the appendix of her paper. However, no sample context is provided by Villalta (2008) for any of the verbs that were judged non-focus-sensitive. In the remainder of this subsection, we will explore how such a context may be constructed. To this end, we will first dissect Villalta’s original context for *want* into its crucial ingredients. Then, we will seek parallel ingredients for *believe/know* and build the corresponding, extended Villalta-style contexts. Finally, we will return to *want* and show that, if we employ here the extension recipe we used for *believe/know*, *want* will incorrectly be judged non-focus-sensitive. The lack of general applicability of this TVJ test will lead us to disfavor the test.

**Key characteristic properties of the truth value judgment based test** Our main goal in this paper is to provide a general recipe for constructing a focus sensitivity test that can be applied to arbitrary predicates in any given language. To probe whether Villalta’s truth value judgment task is a candidate for such a test, we would like to know whether it is possible and what it would take to construct contexts for

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<sup>5</sup>For these examples, Villalta does not say “false” but rather “not true,” presumably in order to leave room for the possibility that the non-true sentences could come out as undefined. Romero (2015) proceeds similarly for “surprise” and “be happy.” In a refinement, Harner (2016) draws a distinction between semantic and pragmatic focus sensitivity, where the position of focus makes a difference between true and false in the former, and between felicitous and infelicitous in the latter. Relying on this distinction, Uegaki and Sudo (2019) explain the anti-roгатivity of non-veridical preferential predicates through their semantic focus sensitivity, and exclude predicates like “decide” based on the commitment that these are pragmatically focus sensitive. In this paper, we do not break down “not true” responses into “false” and “infelicitous” responses, as it is unclear whether consultants, trained or untrained, can reliably distinguish between the two, especially in a cross-linguistic fieldwork setting (Matthewson, 2004; Deal, 2015).

predicates like ‘know,’ ‘believe,’ and the like, which are parallel to what we are given for ‘want’ and ‘be glad.’ The reason that we are interested in constructing contexts is not merely to extend Villalta’s test by making as few changes as possible, but also because the task requires a linguistic consultant to give a pair of truth value (and felicity) judgments, which cannot be accessed for sentences presented out of context (Matthewson, 2004). Thus, we will identify the key properties that characterize the contexts given by Villalta for ‘want’ and ‘be glad,’ generalize over them, and attempt to extend the task to new predicates.

One general assumption that is (tacitly) present in the context provided by Villalta is that there is only one syntax class offered in the semester, that it is taught by only one instructor and on one set of days (as is usually the case in linguistics departments). This means that specifying one instructor name and one set of days is enough to fully resolve the question of who will teach syntax when. To see why this is important, let us briefly assume that there are *two* syntax classes, one taught by Lara for senior graduate students and one by John for incoming graduate students, and that both classes occur on Tuesdays and Thursdays. In this context, (11a) is true, but (11b) is infelicitous.

- (11) **Context:** It is common knowledge that one syntax class is taught by Lara and a second syntax class is taught by John. Both classes occur on Tuesdays and Thursdays.
- a. Lisa knows that John teaches syntax ON TUESDAYS AND THURSDAYS.
  - b. #Lisa knows that JOHN teaches syntax on Tuesdays and Thursdays.
  - c. Lisa knows that JOHN AND LARA teach syntax on Tuesdays and Thursdays.

The reason behind the infelicity of (11b) is that focus on *John* strongly invites a reading under which the sentence is taken to be an exhaustive answer to the question “Which individual(s) *x* are such that Lisa knows that *x* teaches syntax on Tuesdays and Thursdays?” and it is not. In contrast, the sentence in (11c) with both instructors named and narrowly focused is felicitous (and true).

Not controlling for exhaustivity effects, then, is a potential confound for the truth value judgment test for focus sensitivity. To avoid it, the test needs to be formulated against an *exhaustivity neutral context*. Failing to do so could give rise to contrasts like the one between (11a) and (11b) that are indeed driven by the position of focus, but lead to the wrong conclusion that a predicate like ‘know’ is focus sensitive. In general, this is a risk of false positives, i.e., of over-classifying predicates that are not focus sensitive as focus sensitive. The alternative test for focus sensitivity that we will propose in section 3 will also require exhaustivity-neutrality, and we return to the topic in section 3.4.

Unless stated otherwise, all of the contexts provided in this paper are exhaustivity neutral. Concretely, they always involve the background assumption that any given class has only one instructor, and that it occurs on only one day of the week. We will also simplify ‘Tuesdays and Thursdays’ to simply ‘Tuesdays,’ as this is shorter and less dependent on any knowledge of how US linguistics departments work (except when we are directly citing her examples in the next section).

With this in mind, we are ready to move on to a second defining characteristic of Villalta-style contexts, namely, that they are built on the two necessary requirements in (12).

- (12) I. **The conflicting attitude requirement:**
- Lisa has a negative preference for John being the teacher.  
(But having no preference should also suffice.)
  - Lisa has a positive preference for the class to be taught on Tuesdays.
- II. **The substrate attitude requirement:**
- Lisa believes that John will be the teacher (truthfully, at least in the case of ‘be glad’).

In the case of ‘want’ and ‘be glad,’ and preferentials in general, the *conflicting attitude* requirement references the main semantic component of the attitude verb: The agent’s preferences. The *substrate attitude* requirement references belief. We believe that this is due to the fact that preferential predicates induce a preference-based ordering on a modal base consisting of an agent’s doxastic alternatives (Heim, 1992; von Stechow, 1999). Intuitively, the proposition desired is the ordinary semantic value of the embedded clause (e.g., “that John will teach syntax on Tuesdays”) and the proposition believed corresponds roughly to the great union of a contextually restricted subset *C* of the focus semantic value of the embedded clause (e.g., “that John will teach syntax on some days of the week”).<sup>6</sup>

<sup>6</sup>See Section 4 for existing proposals on how this result may be obtained compositionally.

Let us briefly see that the substrate attitude requirement is necessary. Assume the background of the linguistics department faculty meeting from (8), but that it has not been decided who will teach syntax. The latter assumption implies that Lisa has no particular beliefs about who will teach syntax. As before, she has a dispreference for John, and a preference for the Tuesday slot.

- (13) a. **Broad context**  
 There are two people qualified to teach syntax: John and Lara. There is some debate as to who will in fact teach the course, but at the end of the meeting, no decision has been reached.
- b. **Immediate context**  
 Lisa would prefer it if Lara teaches syntax, and she would prefer the class to be held on Tuesdays. It is not the case that Lisa believes that John will teach syntax.
- c. **Target sentences**
- |      |  |          |
|------|--|----------|
| (i)  | Lisa wants John to teach syntax ON TUESDAYS. | NOT TRUE |
| (ii) | Lisa wants JOHN to teach syntax on Tuesdays. | NOT TRUE |

In this context, neither of the sentences in (13c) are true. In particular, for (13ci), the inclusion of ‘John’ in the embedded clause conflicts with the assumption that it hasn’t been decided yet who will teach syntax. One would have to use a definite description (‘the person who will teach syntax’) or an impersonal construction instead.

A final general remark about these two requirements is that they need to be filled in by statements that are consistent with each other. (In practical terms, the substrate attitude statement needs to be weaker than or independent from the non-positive conflicting attitude statement.) In the case of preferentials, consistency is possible because the conflicting attitude and the substrate requirements involve different modalities, respectively bouletic and doxastic, and having a negative preference for John to be the teacher does not contradict the belief that he will be. We will explore different ways of satisfying consistency without appealing to a difference in modality in our discussion of “believe” and “know” below.

This leads us to the following methodological guideline for generalizing Villalta’s focus sensitivity test and applying it to new predicates. First, for a given predicate P one must construct a context that satisfies the conflicting attitude requirement and the substrate attitude requirement. This will involve choosing what these attitudes will be. For some predicates like ‘want,’ the choice might be straightforward, but for others, like ‘believe,’ initial choices might result in a contradiction. (We will shortly see why.) However, given that the conflicting and substrate attitudes may be chosen arbitrarily, it should always be possible to avoid contradiction, should one arise, and construct a context without one. With this context, the next step is to run a truth value judgment task on a pair of sentences, schematized in (14), which minimally differ in the position of focus in the embedded clause. Important is that one of the focused constituents must be the object of the positive attitude (e.g., “on Tuesdays” above).

- (14) a. S Ps that [...X...Y<sub>F</sub>...]  
 b. S Ps that [...X<sub>F</sub>...Y...]

If the first sentence is judged true, but the second is not true, then the predicate P is focus sensitive. If the position of focus does not make a difference in truth value, then we fail to conclude that the predicate is focus sensitive. Again, to be able to draw the stronger conclusion that a predicate is not focus sensitive, one must exhaust all possible contexts.<sup>7</sup>

**Extending the test to ‘believe’ and ‘know’** Let us now return to the doxastic predicates ‘believe’ and ‘know.’ We are now in a position to try to extend Villalta’s focus sensitivity test to these predicates in a conservative manner. We first attempt to identify the attitude that is relevant for the conflicting attitude requirement: In the case of preferential predicates, the attitude was ‘having a preference.’ Let us then assume that in the case of doxastic predicates, it is doxastic—namely, the attitude expressed by the verb.

<sup>7</sup>The failure of one context to bring out a truth conditional difference between the two sentences does not imply that we will find no context in which a truth conditional difference will arise. The best we can hope for given this test is that we will *fail to find evidence* that some predicates are focus-sensitive (rather than being able to find evidence that they are not focus-sensitive). One way of avoiding this confound would be to classify a predicate as focus sensitive just in case we observe a difference in truth value in *this kind of context*, regardless of the particular ways in which it is instantiated for each predicate. This, however, requires a general characterization of these contexts, which we believe is currently out of reach.

This yields (15) and (16). (In the case of (16a), we assume that the factive inference usually associated with ‘know’ is not projected, and read the assumption as “Lisa has no knowledge one way or the other.”)

- (15) **The conflicting attitude requirement for ‘believe’:**
- a. Lisa neither believes that John will teach syntax, nor that he will not.<sup>8</sup>
  - b. Lisa believes that syntax will be taught on Tuesdays.
- (16) **The conflicting attitude requirement for ‘know’:**
- a. Lisa neither knows that John will teach syntax, nor that he will not.
  - b. Lisa knows that syntax will be taught on Tuesdays.

Now, the question is what the substrate attitude might be. In the case of preferentials, we had predicates that made reference to both an agent’s desires and their beliefs, and the substrate attitude was doxastic. In the case of ‘believe’ and ‘know,’ this option is at first sight unavailable: These predicates respectively only make reference to an agent’s doxastic and epistemic state. For concreteness, if, for ‘believe,’ we took the substrate in (17), a contradiction would arise with (15a), making it look like a Villalta-style context cannot be constructed.

- (17) **Unreasonable candidate substrate attitude requirement for ‘believe’**  
Lisa believes that John will be the teacher. Contradicts (15a)

One could stop here and declare that ‘believe’ and (changing what needs to be changed) ‘know’ are not focus sensitive (or rather, that we fail to find evidence for their focus sensitivity), but that conclusion, while correct, is too hasty.

Omitting the substrate requirement would resolve the issue, but example (13) has shown that it is necessary for Villalta’s test to work, and omitting it would make the comparison between doxastic and preferential predicates non-minimal. Instead, we explore the possibility of finding suitable substrate attitudes for doxastic predicates that do not give rise to a contradiction with either one of the attitudes from the conflicting attitude requirement. Our guiding intuition stems from the observation that ‘know’ and ‘believe’ quantify over different information states: What an agent knows, and what they believe. We now ask whether it makes sense to make the following assumption to satisfy the substrate attitude requirement with ‘know.’

- (18) **Reasonable candidate substrate attitude requirement for ‘know’**  
Lisa *believes* that John will be the teacher.

Notice here that this assumption is consistent with Lisa having no *knowledge* that John will be the teacher, in (16a). If we allow for this possibility for ‘know,’ there is no reason not to allow it for ‘believe.’ We simply take a notion of commitment to a proposition, in (19), that is weaker than belief, namely, considering that something is more likely than something else.

- (19) **Reasonable candidate substrate attitude requirement for ‘believe’**  
Lisa *considers it slightly more likely* that John will be the teacher than anyone else.

Note, again, that this assumption is compatible with the assumption that the agent is unopinionated (has no belief one way or another) with respect to whether John will be the teacher, in (15a). (A similar exercise can be done for other doxastic predicates like ‘be certain.’)

On the basis of these assumptions, we can proceed to construct Villalta-style contexts for ‘know’ and ‘believe,’ and perform a truth value judgment task on the sentences in (20b) and (21b).

- (20) **Villalta-style context for ‘know’**
- a. **Immediate context**  
At the faculty meeting, it is decided that syntax will be taught on Tuesday. The meeting ends before a decision can be made about *who* will teach the course. However, John has usually been volunteering to teach syntax in recent years, and Lisa believes that he will do it again.
  - b. **Target sentences**

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<sup>8</sup>Unopinionatedness in the doxastic case (cf. lack of preference in the preferential case) is the weakest assumption that will allow us to run the test. One could alternatively assume the stronger belief that John will not teach syntax (cf. dispreference).

- (i) Lisa knows that John will teach syntax ON TUESDAYS. NOT TRUE
- (ii) Lisa knows that JOHN will teach syntax on Tuesdays. NOT TRUE

With ‘know,’ neither one of these sentences is judged to be true. The intuition is that they are odd, because it is not certain that John will teach syntax—this has not been publicly decided yet—and that the verb’s factive presupposition is therefore not warranted. In addition to this, to the extent that one can interpret these sentences charitably, they ascribe to Lisa a level of certainty that goes beyond what is licensed in context: Perhaps John has told her that he fully intends to teach syntax, and this licenses us to say that she knows it. But, not only is this a way of extending the context as a repair strategy, but also, even under such an extension the position of focus does not have a truth conditional effect: To the extent that the sentences are acceptable, they would both be true.

Let us now turn to ‘believe.’

(21) **Villalta-style context for ‘believe’**

a. **Immediate context**

At the faculty meeting, it is decided that syntax will be taught on Tuesday. The meeting ends before a decision can be made about *who* will teach syntax. Lara and John can both teach the course and neither has signed up to teach anything yet. Lisa knows that John enjoys teaching more than Lara, and suspects that it’s slightly more likely that he will sign up rather than her.

b. **Target sentences**

- (i) Lisa believes that John will teach syntax ON TUESDAYS. NOT TRUE
- (ii) Lisa believes that JOHN will teach syntax on Tuesdays. NOT TRUE

Here too, neither one of these sentences are true. The intuition is that both are ascribing to Lisa a degree of commitment to the proposition that John will teach syntax that is greater than the one warranted by the context. (The reader concerned with the possibility that ‘believe that p’ is less natural in contexts where p is true is invited to modify the context in such a way that it is still unclear, but likely, that syntax will be taught on Tuesdays.)<sup>9</sup>

The interim conclusion here is that even under our best attempts to bring out the focus sensitivity of ‘believe’ and ‘know’ by using the test adapted from Villalta, this result does not follow: We fail to find evidence that these two predicates are focus sensitive. This is a point in favor of this test.

**A reassessment of test contexts for ‘want’** We have seen that our ability to construct the relevant contexts for Villalta’s focus sensitivity test depends on our ability to determine conflicting and substrate attitudes. In the case of preferentials, our choice was tacitly guided by the knowledge that these verbs reference both an agent’s desires and their beliefs. In the case of doxastics, no natural way of satisfying the conflicting and the substrate attitude requirements was available, and we allowed ourselves some flexibility and arbitrariness in determining the substrate attitude. Returning to preferentials, this opens up the possibility of instantiating their substrate requirement with an attitude different from belief. We illustrate an alternative here, and show that the consequence of such a manipulation is that a predicate like ‘want’ no longer comes out as focus sensitive.

Let us instantiate the conflicting attitude requirement for ‘want’ in the way that we have already seen in (12). Instead of picking the belief that John will teach syntax as the substrate attitude, however, let us say that this is instantiated by Lisa not having a preference one way or another regarding whether John teaches syntax.

(22) a. **Conflicting attitude requirement for ‘want’**

- (i) Lisa has a negative preference for John teaching syntax.

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<sup>9</sup>There are two ways of reading (20bi) and (21bi) as *true* in contexts, like the ones given, in which Lisa has no knowledge or belief with the content that John will teach syntax. First, the sentence might be reinterpreted with an embedded conditional: “Lisa knows/believes that *if John teaches syntax*, he will teach it on Tuesdays.” This effect might be due to the possibility of reading ‘will’ as ‘would’ and can be shown to disappear when the target sentences describe past events. Second, it is in principle possible to read “John” *de re* and access truth conditions of the form “Lisa knows/believes that the person who will teach syntax will teach it on Tuesdays.” This is not an issue in the contexts given here as the speaker would not assent to the proposition that John will teach syntax either, as this has not been decided yet. These effects are not driven by focus placement, but they are issues that one might encounter while testing for focus sensitivity and would have to control for.



- (ii) Lisa has a positive preference for syntax to be taught on Tuesday.
- b. **Alternative, non-doxastic substrate attitude for ‘want’**  
Lisa doesn’t care whether or not John teaches syntax.

The observation, of course, is that this choice of a substrate attitude contradicts Lisa’s negative preference in (22a). Consequently, if we had picked ‘not care’ as the substrate attitude for ‘want’ and had not considered any alternatives, we would have had to conclude that it is not possible to construct a Villalta-style context for the predicate. This, in turn, would have led to the conclusion that ‘want’ is not focus sensitive—or, more accurately, to the conclusion that we have failed to find evidence that it is. This is an undesirable result.

The contradiction arises here because we chose negative preference as one of our conflicting attitudes. If we assume instead that the first conflicting attitude is that Lisa has no particular preference for John, like we did for ‘know’ and ‘believe,’ no contradiction would arise. But then, the substrate attitude, being equivalent to that conflicting attitude, becomes redundant. And we have seen, in (13), that a distinct substrate attitude was required for the test under discussion to work. Let us take the same substrate attitude as the one for ‘believe,’ stated in (23).

- (23) **Alternative doxastic substrate attitude for ‘want’**  
Lisa considers it slightly more likely that John will teach syntax.

We are now in a position to construct a context for ‘want’ that doesn’t involve contradiction.

- (24) a. **Immediate context**  
Lisa has a negative preference for John teaching syntax, and a positive preference for the class to be held on Tuesdays. It is not yet decided who will teach the class, but Lisa knows that John enjoys teaching more than Lara, and suspects that it’s slightly more likely that he will sign up rather than her.
- b. **Target sentences**
  - (i) Lisa wants John to teach syntax on TUESDAYS. NOT TRUE
  - (ii) Lisa wants JOHN to teach syntax on Tuesdays. NOT TRUE

In this context, however, the position of focus does not affect the truth value of the sentence: both (24bi) and (24bii) are false. In particular, (24bi) is false because it ascribes to Lisa a preference for John, which contradicts our assumption that she has a negative preference for John. What we see here is, again, that with these particular instantiations of the conflicting and the substrate attitude requirements, this test would suggest the conclusion that ‘want’ is not focus sensitive.

**Conclusions on the truth value judgment based test** In this section, we have seen how Villalta’s original focus sensitivity test works for preferential predicates and how it may in principle be extended to other predicates. Such extensions require the identification of a pair of conflicting attitudes and a substrate attitude that are of a distinct from but consistent with one another, e.g., a pair of desires and a belief. These are the building blocks of a context in which a truth value judgment test can be run on a pair of sentences that differ only in focus position. A difference in truth value indicates that a predicate is focus sensitive; no difference indicates a lack of evidence for focus sensitivity.

The conflicting attitude requirement and the substrate attitude requirement were naturally instantiated in the case of preferential predicates, but testing the focus sensitivity of doxastic predicates required making arbitrary decisions about what the substrate attitude should be. Even though the test correctly identifies ‘want’ and ‘be glad’ as focus sensitive and its extension classifies ‘believe’ and ‘know’ as non-focus sensitive, there are several reasons for looking for an alternative diagnostic for focus sensitivity.

Whether the result of the test can be trusted relies on the identification of the right substrate attitude: If we pick belief, preferentials come out as focus sensitive, if we pick desire (‘not care’) or a form of doxastic commitment that is weaker than belief (‘consider it likely’), the same predicates do not come out as focus sensitive. We do not want the result and the reliability of a test to depend on such a choice. Although it may be impossible to construct a linguistic test that is completely free from arbitrary decision points, it is desirable to have a test that invokes a minimal amount of arbitrary choices per predicate. Moreover, there is no reason to expect that we should know *in advance* and *in a general way* which candidates should be

considered for the substrate attitude associated with a given predicate in a given language—especially when the researcher is not a native speaker. For ‘want’ and ‘be glad,’ we were tacitly guided by our independent (and theoretical) knowledge of the semantic properties of these predicates. The same can be said of ‘believe’ and ‘know,’ for which we made use of our knowledge of the entailment relations between knowing some proposition  $p$ , believing  $p$ , and considering  $p$  likely. If faced with a new predicate in a language that we have enough experience with, we can make use of our intuitions to determine what our options are, but it seems unreasonable to assume that we would be able to do this for unfamiliar predicates in arbitrarily chosen languages.

## 2.2 Coherence-based test

The second test for focus sensitivity involves judging whether a piece of dialogue is coherent or contradictory. We will refer to this test as the *coherence-based test*.

Villalta (2008: 497–498) introduces what we will call a *minimalistic* variant of the coherence-based test. Her examples illustrate a contrast between *know* and *want*. For *know*, she points out that B’s reply to A in (25) is contradictory.

- (25) A Lisa knows that John teaches syntax ON TUESDAYS AND THURSDAYS.  
 B No, that’s not true. Lisa knows that JOHN teaches syntax on Tuesdays and Thursdays.

This is in contrast with *want*, for which B’s reply in (26) is judged to be not contradictory.

- (26) A Lisa wants John to teach syntax ON TUESDAYS AND THURSDAYS.  
 B No, that’s not true. Lisa wants JOHN to teach syntax on Tuesdays and Thursdays.

However, not all speakers find (26) coherent. In fact, Villalta (2008:498, fn. 11) acknowledges herself that “[f]or some speakers, a more explicit context is necessary to make this a natural dialogue.” This motivates her to further introduce another variant of the coherence-based test, which she attributes to Jenny Doetjes. We will call it the *naturalistic* variant. In this variant, B’s reply is elaborated with a more explicit context (which we highlight in bold) (27).

- (27) B: Well, that’s not really true, **as she doesn’t mind which day these classes take place, as long as John is the one who does the teaching**, so one should rather say that Lisa wants JOHN to teach syntax on Tuesdays and Thursdays.

While this additional contextual information makes the dialogue more natural and more clearly consistent, we note that it is predicate specific. Consider *decide* for instance. What would be an appropriate context to include in the dialogue? A simple-minded substitution based on (27) would be non-sensical (28).

- (28) A: Lisa decided that John would teach syntax ON TUESDAYS AND THURSDAYS.  
 B: Well, that’s not really true, **#as she didn’t decide which day these classes would take place, as long as John would be the one who does the teaching**, so one should rather say that Lisa decided that JOHN would teach syntax on Tuesdays and Thursdays.

Of course, we should not conclude from the infelicity of (28) that *decide* is not focus sensitive, because we can make the dialogue coherent by using a different context (29).

- (29) B: Well, that’s not really true, **as she didn’t decide which day these classes would take place — that part had been determined long ago by someone else**, so one should rather say that Lisa decided that JOHN would teach syntax on Tuesdays and Thursdays.

However, note that the second half of the context needs to be adjusted in a predicate-specific way. Therefore, the naturalistic variant of the coherence-based test faces the same limitation as the truth-based test discussed above, i.e., there is no general recipe to construct the relevant contexts.<sup>10</sup>

<sup>10</sup>In principle, one can only include the first half of the context, for which there is indeed a general recipe, i.e., *not P which day these classes take place* (modulo the need for paraphrases when P does not embed questions). However, this would make the dialogue less natural and does not avoid the limitations we will discuss below.

Moreover, in our experience, even the “naturalistic” variant is not so natural after all. Even for canonical focus-sensitive predicates such as *hope* and *want*, for which we can directly use relevant contexts in the literature, our consultants often found the dialogues complicated and artificial. Of course, it may well be that we were facing this difficulty because we were not using optimal dialogues. But this in fact illustrates another limitation of the test, i.e., it is difficult to know what dialogues would be good to use. What counts as a good dialogue will probably differ from language to language. In addition, because the naturalistic variant requires an explicit context in the dialogue, such a context needs to be properly translated into the target language and integrated into the dialogue. This will likely involve language-specific adjustments that will reduce the uniformity of the test across languages.

Finally, the coherence-based test involves a denial in the dialogue. This raises a general concern about what the denial is doing and whether it is doing the same thing across languages. This is particularly so for the minimalistic variant in (25). The dialogue might be judged consistent in a context where the Question Under Discussion (QUD, à la Roberts 2012) is about Lisa’s preference about who will teach syntax on Tuesdays and Thursdays rather than her preference about when John will teach syntax. In such a context, B’s response can be seen as a metalinguistic move to correct A’s placement of narrow focus so that it will be congruent with the QUD. While this possibility might not be available in the English version of (25) because B’s response uses *that’s not true*, but there is no guarantee that the target language has such a truth predicate, or that it is natural to use it in a denial. For instance, if in the target language it is only possible to use a counterpart of *that’s incorrect* in English, then B’s response can be more easily judged consistent under the metalinguistic correction interpretation. As a result, all predicates may turn out to be focus sensitive due to the general constraint on focus-question congruence, which is not the kind of focus sensitivity we are interested in. Of course, one can always ask consultants to rule out such metalinguistic corrections when judging the consistency of the dialogue. However, the distinction can be quite subtle, and is likely to make the results less comparable crosslinguistically. For the naturalistic variant (29), the concern is alleviated because the additional context makes it clearer that the response is not just a metalinguistic correction. But note that B’s response uses *well, not really* and *one would rather say*. While such expressions can help make the dialogue more natural, they may well introduce their own idiosyncratic effects that reduce the crosslinguistic uniformity of the test. Therefore a test that avoids such confounding factors altogether would be better.

In sum, the coherence-based test probes for focus sensitivity by checking whether it is consistent to deny a sentence (with a certain narrow focus) and assert the same sentence with a different narrow focus.<sup>11</sup> However, it is difficult to construct good dialogues (let alone creating a general recipe for constructing good dialogues for any given predicate in any given language) that sound natural and guarantee that the denial is not just a metalinguistic correction. This is particularly so for the minimalistic variant. In order to make the dialogues more natural, researchers need to provide more elaborate contexts, but again there is no general recipe to construct such contexts. In the next section, we propose an alternative test that avoids these limitations.

### 3 Our proposal: Entailment-based test

#### 3.1 The basic proposal

In the previous sections, we have identified two major issues with existing tests for focus-sensitivity: (a) the need to construct predicate specific contexts, for which no general recipe is available, and (b) the confounding effects of denial. In the truth-based test and the naturalistic variant of the coherence-based test, the researcher needs to construct predicate-specific contexts, even though they might not know a priori which contexts are relevant for a given predicate. This issue makes it impossible to construct a diagnostic

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<sup>11</sup>In fact, a different test based on this idea would be to directly test for the consistency of sentences such as *Ann wants Lisa to teach syntax on TUESDAYS, but she doesn’t want LISA to teach syntax on Tuesdays*. Such a test also faces the concerns that the sentence may not sound very natural and that the negation might be used meta-linguistically. In addition, for a neg-raising predicate  $P$ , *Ann Ps  $\varphi$  and Ann does not P  $\varphi'$*  (where  $\varphi$  and  $\varphi'$  only differ in the placement of narrow focus) is likely interpreted as  $P\varphi \wedge P\neg\varphi'$ , which is a stronger claim than the intended  $P\varphi \wedge \neg P\varphi'$ . Therefore, it is possible that the intended interpretation  $P\varphi \wedge \neg P\varphi'$  is consistent but the strengthened  $P\varphi \wedge P\neg\varphi'$  is not, and the consultant’s judgment is for the strengthened interpretation because it is more salient.

that is general enough to be applied to different predicates in different languages. Without knowing what the relevant contexts are, researchers are simply unable to construct the corresponding tests. The minimalistic variant of the coherence-based test is free from this problem as the test can be constructed without reference to a predicate-specific context. However, as we have seen, the test faces problems due to the unnaturalness of the dialogue and the complications introduced by the denial.

We propose to address both of these issues by means of a test that probes the consultant’s judgments about *entailment* rather than truth or coherence.<sup>12</sup> The test can be schematically presented as follows:

- (30) Commonly known background assumption: syntax will be taught on only one day of the week and only one person will be teaching it.
- a. Lisa *Ps* that Peter will teach syntax on TUESDAY. (premise)
  - b. Lisa *Ps* that Peter will teach syntax. (conclusion)

Does (30a) always imply (30b), or, instead, is (30a) compatible with Lisa not *P* who will teach syntax?<sup>13</sup>

If the target predicate *P* is focus-sensitive, (30a) does not entail (30b). Roughly, this is because focus-sensitivity allows the attitude *P* to be specifically ‘about’ the focused part of the complement while not being about the non-focused part. On the other hand, if *P* is non-focus sensitive, (30a) entails (30b) as long as the attitude is upward-monotone (see the discussion in §3.3 below for discussion on monotonicity in relation to this test). As a concrete example, consider the following pair involving the predicate *hope*:

- (31) a. Lisa hopes that Peter will teach syntax on TUESDAY. (premise)  
 b. Lisa hopes that Peter will teach syntax. (conclusion)

Intuitively, (31a) does not entail (31b), because in a context where Lisa does not have any preference about who teaches what, but only has a preference about the day on which syntax is taught, (31a) is true while (31b) is false. So *hope* is focus-sensitive according to this test. This contrasts with the case of *know*, which we can take to be a typical non-focus-sensitive upward entailing predicate:

- (32) a. Lisa knows that Peter will teach syntax on TUESDAY. (premise)  
 b. Lisa knows that Peter will teach syntax. (conclusion)

Here, native speakers judge (32a) to entail (32b). In other words, it would be impossible for them to come up with a context in which (32a) is true and (32b) is false. We will discuss the results of our empirical study with native speakers of English and Spanish in Section 4.

Since a question about entailment can be constructed without reference to a particular context, the test can be stated in a general way. This overcomes the common problem for the truth-based and coherence-based tests. The test can be run without any a priori knowledge on the part of the researcher regarding what might constitute a relevant context that reveals a predicate’s focus-sensitivity. We take this to be an important advantage of the entailment test over the truth-based test and the naturalistic variant of the

<sup>12</sup>Tonhauer and Matthewson (2016) argue that in general, to probe whether a certain inference arises from a certain linguistic construction, one should not use a test formulated in terms of the theoretical notion of *entailment* but rather one that is formulated in terms of a more commonplace notion like *implication*, since consultants may not have sufficient training in linguistics (semantics in particular) to understand what is meant by *entailment*. Our formulation of the test below incorporates their recommendation.

<sup>13</sup>The question is intended to be read as an open disjunctive question, presenting two alternatives and asking which of them, if any, is the case, leaving open the possibility that neither of them holds (see, e.g., Roelofsen and Farkas, 2015). The first disjunct asks whether the premise (30a) always implies (i.e., entails) the conclusion (30b), which will ultimately determine the test result. We include the second disjunct as a hint to help our consultants look for scenarios where the inference fails, i.e., scenarios where the premise is true but the conclusion is false. Note that even though this second disjunct would be different for different predicates, it is generally rather straightforward to create it using the template here. If the predicate takes interrogative complements, we can directly substitute it for *P*. For instance, the second disjunct for *know* would be asking whether the premise is compatible with Lisa not knowing who will teach syntax. If the predicate does not take interrogative complements, then one can try to use nominalization or antonyms to convey the second disjunct. For example, the second disjunct for *believe* could be asking whether the premise is compatible with Lisa having no beliefs about who will teach syntax, and for *hope* it could be asking whether the premise is compatible with Lisa being indifferent about who will teach syntax. Furthermore, it is not essential to include the second disjunct for the test to work—if it is difficult to construct it for a particular predicate, we can still obtain consultant’s judgment about whether the premise entails the conclusion without it.

coherence-based test. At the same time, the test does not involve denial in the object language. Thus, it avoids the confounds arising from denial in the minimalistic variant of the coherence-based test.

One may point out, however, that application of the entailment test *in practice* does require reference to particular contexts, and thus the test is not immune to the problem with the truth-based and coherence-based tests. When a consultant judges whether (30a) entails (30b), they may fail to consider relevant contexts that validate (30a) while falsifying (30b) (i.e., situations that serve as counterexamples to the entailment), and hence judge the predicate not to be focus-sensitive even though in fact it is. For example, when judging whether sentence (30a) entails (30b), a consultant may fail to take into account the type of counterexample situation described above, and only consider cases where Lisa has preferences about who teaches what. On the basis of the fact that (30a) contextually entails (30b) given that Lisa has such preferences, they may report that *hope* is not focus-sensitive. In order to avoid such ‘false negatives’, the researcher has to make the consultant aware of particular contexts that may reveal a predicate’s focus sensitivity. But, a priori, a researcher might not know what those relevant contexts are. This exactly was the problem with the truth-based and coherence-based tests.

This is a legitimate concern. Nevertheless, the very fact that the entailment test can be stated in a general way allows the researcher to initiate the investigation without knowledge about what constitutes relevant contexts. The researcher can initially use the generic form of the test to ask consultants to provide their judgments and to describe relevant counterexample contexts if they judge the entailment not to hold. Such contexts can then be highlighted in subsequent stages of the investigation with different predicates, speakers, and/or languages. In other words, the entailment test enables the researcher to ‘outsource’ the task of initially coming up with relevant contexts to consultants. This is in contrast to the truth-based and coherence-based tests, which do not get off the ground without reference to particular contexts.

In the rest of this section, we review a historical precedent of the entailment test due to Dretske (1972), and furthermore discuss several confounding factors in the implementation of the entailment-based test concerning exhaustivity and monotonicity.

### 3.2 Historical precedent: Dretske (1972)

We are not the first to propose utilising entailment to detect focus-sensitivity of clause-embedding predicates. In fact, observations concerning entailment was a crucial part of Dretske’s (1972) argument about the focus-sensitivity of certain clause-embedding predicates.<sup>14</sup> Below, we present a slightly simplified version of his example about the predicate *advise* (Dretske, 1972, 415-416):

- (33) a. Alex advised Clyde to sell his car to Schulz for THIRTY THOUSAND DOLLARS. (premise 1)  
b. Alex advised Clyde to sell his car to SCHULZ for thirty thousand dollars. (premise 2)  
c. Alex advised Clyde to sell his car to Schulz. (conclusion)

Dretske points out that (33a) doesn’t entail (33c) but (33b) does. As a situation in which (33a) is true while (33c) is false, Dretske provides the following kind of story:

- (34) Context: Clyde was considering selling his car. Schulz, down the street, had expressed an interest in buying it and has offered him \$30,000 for it. Clyde asked Alex for an advice regarding this offer, considering whether he should take the offer or he should wait until the car becomes even more valuable. Alex advised Clyde to take the offer. It turned out, however, that Schulz was a con man and the cheque Clyde received for the car was worthless. Clyde then blamed Alex for giving him a rotten piece of advice. To this, Alex replied by saying the following ‘Now wait a minute. You simply asked me for advice on whether or not you should sell the car for \$30,000. You didn’t ask me, nor did I advise you, about whom to sell the car to. I don’t even know Schulz.’

According to Dretske’s judgment, the story makes (33a) true since Alex’s advice resolved Clyde’s question about whether to sell the car now for \$30,000 or to wait. However, in the same situation, (33c) is false since Alex’s advice was not about who to sell the car to.

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<sup>14</sup>We extend our gratitude to Felix Fr uhuf for drawing our attention to the entailment aspect of Dretske’s discussion on focus sensitivity.

The formulation of our test follows this important historical precedent due to Dretske (1972), but it also differs from it in crucial respects. To begin with, Dretske did not propose a general formulation of a test to diagnose focus sensitivity of clause-embedding predicates. Rather, his purpose was to point out focus sensitivity of specific clause-embedding predicates such as *advise* using the entailment data like above. As stressed in the beginning of the section, our aim instead is to formulate a test that is applicable to clause-embedding predicates in general. Moreover, we identify several confounding factors in the implementation of the entailment-based test which have not been previously explicitly addressed. These confounds concern monotonicity and exhaustivity. In the following sections, we will discuss these issues and propose ways to control for the confounds.

### 3.3 Monotonicity

The discussion in the previous sections focuses on *upward-entailing* (UE) predicates. Recall that we can show a predicate is focus sensitive by showing that, depending on the focus structure of the premise, it may or may not entail the conclusion. For an UE predicate, by definition, when a broad focus is on the embedded clause, the premise entails the conclusion.

- (35) Commonly known background assumption: syntax will be taught on only one day of the week and only one person will be teaching it.
- a. Lisa *Ps* that [Peter will teach syntax on Tuesdays]<sub>F</sub>. (premise)
  - b. Lisa *Ps* that [Peter will teach syntax]<sub>F</sub>. (conclusion)

Therefore, if the premise with a narrow focus on *Tuesdays* does not entail the conclusion, then the predicate is focus sensitive. And if the premise still entails the conclusion no matter where the narrow focus is placed in the embedded clause (e.g., under the verb *believe*), the predicate is not focus sensitive.

- (36) Commonly known background assumption: syntax will be taught on only one day of the week and only one person will be teaching it.
- a. Lisa *Ps* that Peter will teach syntax on TUESDAY<sub>F</sub>. (premise)
  - b. Lisa *Ps* that [Peter will teach syntax]<sub>F</sub>. (conclusion)

On the other hand, for non-UE predicates, by definition, the premise does not entail the conclusion when a broad focus is placed on the embedded clause, e.g., *doubt*.

- (37) Commonly known background assumption: syntax will be taught on only one day of the week and only one person will be teaching it.
- a. Lisa doubts that [Peter will teach syntax on Tuesdays]<sub>F</sub>. (premise)
  - b. Lisa doubts that [Peter will teach syntax]<sub>F</sub>. (conclusion)

Therefore, in order to show that a non-UE predicate is focus sensitive, we need to show the opposite inference pattern with narrow focus. In the case of *doubt*, when the narrow focus is on *Peter*, the premise entails the conclusion. Therefore it is indeed focus sensitive.

- (38) Commonly known background assumption: syntax will be taught on only one day of the week and only one person will be teaching it.
- a. Lisa doubts that PETER<sub>F</sub> will teach syntax on Tuesdays. (premise)
  - b. Lisa doubts that [Peter will teach syntax]<sub>F</sub>. (conclusion)

A caveat of this test is that it is not always clear whether a predicate is UE. It is probably clear for *believe*, but not so much for *want* or *hope* (see, e.g., von Stechow, 1999, 2018; Crnič, 2011; Portner and Rubinsteyn, 2020, for related discussions; see also fn. 16).

- (39) a. Lisa believes that [Peter will teach syntax on Tuesdays]<sub>F</sub>. (premise)  
 b. Lisa believes that [Peter will teach syntax]<sub>F</sub>. (conclusion)
- (40) a. Lisa hopes that [Peter will teach syntax on Tuesdays]<sub>F</sub>. (premise)  
 b. Lisa hopes that [Peter will teach syntax]<sub>F</sub>. (conclusion)

Acknowledging this caveat, our strategy is to always assume the predicate is non-UE when the consultant is in doubt and apply the additional test.

### 3.4 Exhaustivity-neutrality

Recall the discussion of exhaustivity neutrality in section 2.1, where we observed that failing to construct sentences that were exhaustivity neutral when applying Villalta’s truth value judgment test would lead to overclassifying predicates as focus sensitive. Here, we underline the fact that the entailment based test also requires exhaustivity neutrality, but that when this requirement is not satisfied, a different effect arises.

To ensure exhaustivity neutrality, we provide, in (30), the background assumption that *syntax will be taught on only one day of the week and only one person will be teaching it*. Without this background assumption, say, in a context in which syntax takes place on *two* days of the week but taught by the same instructor, we observe that the test sentence in (41a) is judged to be misleading.

- (41) Context: It is general knowledge that syntax will be taught on *two* days of the week and only one person will be teaching it.
- a. Lisa believes that Peter will teach syntax on TUESDAYS. misleading
  - b. Lisa believes that Peter will teach syntax.

The reason for this judgment is that placing focus on the day of the week requires the sentence to be an exhaustive answer to the question “When does Lisa believe that Peter will teach syntax?” but it is not, as only one out of the two days is named. Observe, here, that a sentence like (42) is felicitous, where that question is answered exhaustively.

- (42) Lisa believes that Peter will teach syntax on TUESDAY AND THURSDAY.

In the original truth value judgment task test provided by Villalta, exhaustivity effects could have led to an incorrect classification of non-focus sensitive predicates as focus sensitive. Truth conditional differences might arise between two sentences with different positions of focus because of exhaustivity. Here, the effect is different: For many predicates, not satisfying exhaustivity neutrality will then lead to the judgment that the test sentence is not true. As this test sentence is designed to be the premise of an inference, e.g., from (41a) to (41b), such a judgment has the consequence that the test that we propose cannot be run. Indeed, it makes little sense to ask (in any non-formal sense) whether a conclusion follows from a false or an infelicitous premise. It is possible that exhaustivity effects will not arise for every predicate, but it is enough for us to control for it that there exist predicates like ‘believe’ for which they arise.

Finally, we note that for predicates that are not upward entailing, a failure to meet exhaustivity neutrality results in a different effect. We have seen in the previous subsection that a sentence like (43a) does not entail (43b), but that to make sure that this entailment fails because of focus sensitivity rather than non-upward monotonicity, the additional test in (44) is needed.

- (43) a. Lisa doubts that Peter will teach syntax on TUESDAYS.  
b. Lisa doubts that Peter will teach syntax.

For the predicate ‘doubt’ to come out as focus sensitive, it needs to be the case that (44a) now entail (44b).

- (44) a. Lisa doubts that PETER will teach syntax on Tuesdays.  
b. Lisa doubts that Peter will teach syntax.

Crucially, this entailment only goes through in a context where there is only one instructor for the course. If, say, Lara is also tasked with teaching a syntax course, (44a) could be true and (44b) false in the following context:

- (45) Lisa thinks that Peter will teach syntax, but that he can’t be teaching it on Tuesdays. That’s the day he dedicates to research.

If, on the other hand, there can only be one syntax instructor, the entailment does go through.

### 3.5 Interim summary

In this section, we have discussed three tests for focus-sensitivity: the truth-based test, the coherence-based test, and the entailment-based test. We have pointed out that the truth-based test requires construction of suitable predicate-specific contexts, which is impossible a priori for an arbitrary predicate in an arbitrary language. The coherence-based test has a simplistic variant and a naturalistic variant. Although the simplistic variant can in principle be formulated in a general way, thus overcoming the problem with the truth-based test, it is often felt to be unnatural by native speaker consultants, as already pointed out by Villalta (2008). The naturalistic variant is designed to address this issue. However, this variant requires predicate-specific contexts, and thus suffers from the same problem as the truth-based test. Moreover, both variants of the coherence-based test involve the object-language expression of negation/denial, which may target falsity and/or infelicity in distinct ways across languages. This creates further challenges for the application of the test, as well as for the cross-linguistic comparison of test results. We concluded this section by providing positive arguments for the entailment-based test, which can be formulated in a general way and can be applied uniformly across predicates and languages. We have discussed two methodological issues that may arise when applying the entailment-based test—one concerning monotonicity and one concerning exhaustivity-neutrality. We also suggested ways to address these issues.

## 4 Some results of applying the entailment-based test

To provide a concrete illustration of where the entailment-based test draws the line between clause-embedding predicates that are focus-sensitive and ones that are not, we now discuss the results of applying the test to twelve predicates in English and the corresponding twelve predicates in Spanish, listed in Table 1, which are representative for some broader classes of predicates in these languages which are of particular interest to the theoretical literature on clause-embedding (for reasons discussed below).<sup>15</sup>

Of course we realize that the sample of predicates and the sample of languages that we consider here is very small. The current paper mainly intends to make a methodological contribution, and an extensive empirical investigation of focus-sensitive clause-embedding predicates across languages is beyond its scope. Still, we believe that a concrete illustration of the test, even with a very small sample of predicates, adds value to the paper, because, as we will see, the results of applying the test to these predicates are not always in line with empirical assumptions or predictions made in previous work and in some cases shed new light on ongoing debates in the theoretical literature. Overall, according to the entailment-based test more predicates are focus-sensitive than has been assumed in previous work.

We will go through the predicates in Table 1 from top to bottom. The first four predicates, *believe/creer*, *know/saber*, *say/decir*, and *claim/afirmar*, are often viewed in the literature as proto-typical cases of predicates that are *not* focus-sensitive. The next two, *hope/esperar* and *want/querer* are often considered as proto-typical cases of predicates that *are* focus-sensitive. For these cases, our entailment-based test yields no surprises. Predicates 1-4 come out as non-focus-sensitive, and predicates 5-6 come out as focus-sensitive, as expected. For instance, (46a) was judged by our informants not to entail (46b).

- (46) a. Ana quiere                                    que Pedro enseñe                                    sintaxis los MARTES.  
 Ana want.3SG.IND.PRS that Peter teach.3SG.SUBJ.PRES syntax DET Tuesdays  
 ‘Ana wants Peter to teach syntax on TUESDAYS.’ (premise)
- b. Ana quiere                                    que Pedro enseñe                                    sintaxis.  
 Ana want.3SG.IND.PRS that Peter teach.3SG.SUBJ.PRS syntax  
 ‘Ana wants Peter to teach syntax.’ (conclusion)

This finding is in line with semantic theories of preferential predicates like *hope/esperar* and *want/querer* which assume that such predicates involve comparison of alternatives and that focus constrains the shape of the comparison class (Villalta, 2008; Romero, 2015; Uegaki and Sudo, 2019). More concretely, *want/querer* compares the embedded proposition *p* to propositions in a contextually determined comparison set *C*, which is a subset of the set of focus alternatives of *p*. On Villalta’s proposal, *want/querer* presupposes that all

<sup>15</sup>Our English consultant is a native speaker of British English and has an undergraduate degree in linguistics. Our Spanish consultant is a native speaker of Peninsular Spanish who is a masters student in linguistics.



	English predicate	Focus sensitive?	Spanish predicate	Focus sensitive?	Predicate class
1.	believe	no	creer	no	doxastic
2.	know	no	saber	no	doxastic
3.	say	no	decir	no	speech-reporting
4.	claim	no	afirmar	no	speech-reporting
5.	hope	yes	esperar	yes	preferential
6.	want	yes	querer	yes	preferential
7.	answer	yes	responder	yes	question-addressing
8.	guess	yes	adivinar	yes	question-addressing
9.	decide	yes	decidir	yes	change of state
10.	learn	yes	aprender	yes	change of state
11.	assume	yes	suponer	yes	weak doxastic
12.	suspect	yes	sospechar	yes	weak doxastic

Table 1: Results of applying the test to a number of predicates in English and Spanish.

alternatives in  $C$  are compatible with the subject’s doxastic state  $\text{Dox}_x(w)$ , and asserts that the subject finds  $p$  more desirable than any other proposition  $q \in C$ .

- (47)  $\llbracket x \text{ wants}_C p \rrbracket^w$  (Villalta, 2008, p. 480)
- a. Presupposition:  $\forall q \in C. \text{Dox}_x(w) \cap q \neq \emptyset$
- b. Assertion:  $\forall q \in C. (q \neq p \rightarrow (p >_{\text{Des}_x(w)} q))$

This treatment of *want/querer* correctly predicts that (46a) does not entail (46b). After all, from the assumption that Ana finds the possibility that ‘Pedro teaches syntax on Tuesdays’ more desirable than all the elements of the comparison class given in (48) it does not follow that Ana finds the possibility that ‘Pedro teaches syntax’ more desirable than all the elements of one of the potential comparison classes—corresponding to polarity focus and broad focus, respectively—specified in (49):

- (48) Ana wants [Peter to teach syntax on TUESDAYS]  
 $C = \{ \text{Peter teaches syntax on Mondays, Peter teaches syntax on Tuesdays, } \dots \}$
- (49) Ana wants [Peter to teach syntax]  
 $C_1 = \{ \text{Peter teaches syntax, Peter does not teach syntax } \}$  [assuming polarity focus]  
 $C_2 = \{ \text{Peter teaches syntax, Jane manages admissions, Sue chairs the department, } \dots \}$  [assuming broad focus]

Besides *want* and *hope*, the class of preferential predicates, whose interpretation has been argued to involve comparison with focus alternatives, also includes *wish*, *fear*, *be glad*, and *regret*, among others.<sup>16</sup>

We now turn to the next two predicates in Table 1, *answer/responder* and *guess/adivinar*. These are instances of a class of predicates which we refer to as *question-addressing* predicates.<sup>17</sup> They describe an

<sup>16</sup> We have exemplified how one can capture the focus-sensitivity of preferential predicates by directly including in their lexical entry a variable  $C$  whose value is constrained by focus. But note that the pathway in which focus affects the truth conditions of these predicates may also be more indirect. For example, under the presupposition-based analysis of *want* considered in von Stechow (1999), focus does not constrain the comparison class  $C$  but rather imposes a presupposition on the local context. This presupposition projects to the doxastic modal base and in this way constrains the doxastically accessible propositions. Similarly, Rubinstein (2012) advocates a mechanism adding certain background assumptions to the modal base (though these background assumptions are based on the alternatives  $p$  and  $\neg p$  and not on focus-based alternatives, a choice that Romero (2015) criticizes). Overall, this second approach is also capable of deriving focus-sensitivity for preferential predicates and may be extendable to other classes of predicates. Choosing one over the other may have consequences for the monotonicity of the predicates (see caveat in subsection 3.3 above). We leave this issue open for future research.

<sup>17</sup> Spanish *adivinar* expresses that the subject gives a tentative, guess-like solution to a question or puzzle. This question or puzzle is then referred to by  $C$ . English *guess* can be used this way too, but in addition it has a second reading, exemplified in (ia)

event aimed at (making progress toward) resolving a given question. For example, *answer/responder* is used not just to report that a proposition  $p$  was communicated, but that  $p$  was presented as a resolution of a contextually given question  $C$ . In previous work, diverging claims/predictions have been made concerning the focus-sensitivity of such predicates. In particular, while Villalta (2008) does not explicitly discuss *answer/responder*, her formal analysis predicts that this predicate is not focus-sensitive (otherwise it would have to select for subjunctive mood in Spanish, which it does not). On the other hand, Romero (2013) claims that *answer/responder* is focus-sensitive. Our entailment-based test confirms the latter claim: our informants judge that (50) does not entail (51).

- (50) Ana responde que Pedro enseñará sintaxis los MARTES.  
 Ana reply.3SG.IND.PRS that Peter teach.3SG.FUT syntax DET Tuesdays  
 ‘Ana answers that Peter will teach syntax on TUESDAYS.’
- (51) Ana responde que Pedro enseñará sintaxis.  
 Ana reply.3SG.IND.PRS that Peter teach.3SG.FUT syntax  
 ‘Ana answers that Peter will teach syntax.’

This can be explained if focus constrains, again, the shape of the  $C$  parameter in the lexical entry of *answer/responder*, as sketched in (52).

- (52)  $[[x \text{ answers}_C p]]^w$   
 a. Presupposition:  $C$  is a salient question in  $w$   
 b. Assertion:  $\forall w' [ w' \text{ is compatible with what } x \text{ says in } w \text{ in reply to } C \rightarrow p(w') ]$

We now turn to the next two predicates in Table 1, *decide/decidir* and *learn/aprender*. These are instances of so-called *change-of-state* predicates. According to the entailment-based test, such predicates are focus-sensitive. For instance, (53a) is judged not to entail (53b):

- (53) a. Ana ha decidido que Pedro enseñe sintaxis los MARTES.  
 Ana have.3SG.IND.PRS decide.PTCP that Peter teach.3SG.SUBJ.PRS syntax DET Tuesdays  
 ‘Ana decided that Peter will teach syntax on TUESDAYS.’ (premise)
- b. Ana ha decidido que Pedro enseñe sintaxis.  
 Ana have.3SG.IND.PRS decide.PTCP that Peter teach.3SG.SUBJ.PRS syntax  
 ‘Ana decided that Peter will teach syntax.’ (conclusion)

Besides *decide/decidir* and *learn/aprender*, other change-of-state predicates that were classified as focus-sensitive by our informants with the entailment-based test are *inform/informar* and *clarify/aclarar*. The focus-sensitivity of this class of predicates has mostly remained undetected in the literature.<sup>18</sup>

Let us sketch how the focus-sensitivity of change-of-state predicates may be captured, focusing on the case of *decide*. Using a neo-Davidsonian event semantics for attitude verbs à la Hacquard (2010), *decide* has been analysed as involving a change from a prior cognitive state  $s_1$  that does not yet entail the complement proposition  $p$  to a posterior cognitive state  $s_2$  that does entail  $p$  (White and Rawlins, 2018a), roughly as in (54)-(55):<sup>19</sup>

- (54)  $[[x \text{ decides } p]]^w =$

and unavailable for Spanish *adivinar* in (ib), that simply expresses low commitment (without necessarily making reference to a question) and that makes it similar to weak doxastic predicates like *suppose*, *assume* or *suspect*. The present issue-addressing class is only concerned with the first reading of *guess*.

- (i) Context: The speaker looks out the window and sees that it is snowing heavily.  
 a. I guess I’ll stay home tonight.  
 b. {Supongo / #Adivino} que me voy a quedar en casa esta noche.  
 suppose.1SG / guess.1SG that REFL go.1ST to stay at home this night  
 lit. ‘I suppose/guess that I’ll stay home tonight.’

<sup>18</sup>Specifically, Villalta (2008) does not examine *decidir* ‘decide’, *aprender* ‘learn’ and *informar* ‘inform’, and, using the truth-based test, misclassifies *aclarar* ‘clarify’ as not focus-sensitive. Uegaki and Sudo (2019) classify *decide* as pragmatically but not semantically focus-sensitive, see also footnote 5.

<sup>19</sup>The proposal of White and Rawlins has been simplified here for expository purposes.

$$\begin{aligned}
& \exists e [ \text{decide}_w(e) \wedge \text{Agent}_w(e)=x \wedge \\
& \quad \exists s_1, s_2 [ s_1 \text{ is the cognitive state of } x \text{ in } w \text{ immediately preceding } e \wedge s_1 \stackrel{\text{CON}}{\not\Rightarrow} p \wedge \\
& \quad \quad e \text{ changes state } s_1 \text{ into state } s_2 \wedge \\
& \quad \quad s_2 \text{ is the cognitive state of } x \text{ in } w \text{ immediately following } e \wedge s_2 \stackrel{\text{CON}}{\Rightarrow} p ] ] \\
(55) \quad s \stackrel{\text{CON}}{\Rightarrow} p_{\langle s,t \rangle} & \text{ iff } \cap \{p' \mid p' \text{ is compatible with } s\} \subseteq p \quad (\text{White and Rawlins, 2018a, (33)})
\end{aligned}$$

This basic lexical entry for *decide* does not make reference to the focus alternatives of the embedded proposition, so it does not capture the focus-sensitivity of the predicate. To achieve this, the entry can be minimally modified, requiring that the prior state  $s_1$  does not only fail to contextually entail the embedded proposition  $p$  but also fails to entail any contextually relevant alternative to  $p$ , where the set of relevant alternatives  $C$  is again constrained by focus, just as in the case of *answer* and *want*. This yields an entry along the lines of (56)-(57):

$$\begin{aligned}
(56) \quad \llbracket x \text{ decides}_C p \rrbracket^w & = \\
& \exists e [ \text{decide}_w(e) \wedge \text{Agent}_w(e)=x \wedge \\
& \quad \exists s_1, s_2 [ s_1 \text{ is the cognitive state of } x \text{ in } w \text{ immediately preceding } e \wedge s_1 \stackrel{\text{CON}}{\not\Rightarrow} C \wedge \\
& \quad \quad e \text{ changes state } s_1 \text{ into state } s_2 \wedge \\
& \quad \quad s_2 \text{ is the cognitive state of } x \text{ in } w \text{ immediately following } e \wedge s_2 \stackrel{\text{CON}}{\Rightarrow} p ] ] \\
(57) \quad s \stackrel{\text{CON}}{\Rightarrow} C_{\langle \langle s,t \rangle, t \rangle} & \text{ iff } \exists p_{\langle s,t \rangle} \in C: s \stackrel{\text{CON}}{\Rightarrow} p \quad (\text{see White and Rawlins, 2018a, (35)})
\end{aligned}$$

We now turn to the last two predicates in Table 1, *assume/suponer* and *suspect/sospechar*. These are instances of a class of predicates that we refer to as *weak doxastive* predicates. According to the entailment-based test, they are focus-sensitive. For instance, (58a) is judged not to entail (58b).

- (58) a. Ana supone que Pedro enseñará sintaxis los MARTES.  
 Ana assume.3SG.IND.PRS that Peter teach.3SG.FUT syntax DET Tuesdays  
 ‘Ana assumes that Peter will teach syntax on TUESDAY’. (premise)
- b. Ana supone que Pedro enseñará sintaxis.  
 Ana assume.3SG.IND.PRS that Peter teach.3SG.FUT syntax  
 ‘Ana assumes that Peter will teach syntax’. (conclusion)

Interestingly, when asked about the reason *why* (58a) does not entail (58b), our informants offered explanations along the lines of (59):

- (59) Explanation from informant:  
 In (a) Ana already knows that Pedro will be teaching syntax but what she is supposing is the day of the week that he will be teaching. In (b) what Ana is assuming is that Pedro will teach syntax.

If we assume that ‘ $x$  *supone*  $p$ ’ literally means ‘ $x$  doxastically endorses  $p$  at least to degree  $\theta$ ’ (where  $\theta$  is a contextually determined threshold), while pragmatically implicating that ‘ $x$  is not sure/does not know  $p$ ’, i.e., that the literal meaning of *suponer* ‘assume’ imposes only a lower-bound requirement on the degree of endorsement, while the pragmatically strengthened interpretation also includes an upper bound requirement, then what we see in this case is that the informant’s judgment is based on the pragmatically strengthened interpretation. While it is interesting that focus-sensitivity is detected in such cases too, it is important to distinguish potential cases of implicature-based focus-sensitivity from focus-sensitivity pertaining strictly to literal meaning.<sup>20</sup> Note that this distinction can only be detected if, when running the entailment test, consultants are asked about the reasoning behind their judgments.

<sup>20</sup>To substantiate the significance of this distinction, we note that Villalta (2008) classifies *suponer* and *sospechar* as predicates that are *not* focus-sensitive. At face value, our entailment-based test simply contradicts this classification. But our informants’ explanations suggest that the full story is more nuanced. Namely, these predicates do not exhibit focus-sensitivity pertaining strictly to their literal meaning, in line with Villalta’s classification. On the other hand, they do exhibit focus-sensitivity when implicatures are taken into account, something that is not reflected by Villalta’s classification.

## 5 Summary and outlook

A number of analyses of the syntactic and semantic behaviours of clause-embedding predicates make crucial use of the property of focus sensitivity (e.g., Villalta, 2008; Romero, 2015; Uegaki and Sudo, 2019; Wehbe and Flor, 2022). However, although the analytical intuition behind this property—that the predicate is sensitive to the focus structure of the complement—is relatively straightforward, there are challenges associated with the construction of a concrete empirical test for focus sensitivity which can be applied to any arbitrary predicate in a cross-linguistic setting. In this paper, we have critically examined the generality of three types of empirical test for focus-sensitivity: the truth-based test, the coherence-based test, and the entailment-based test, and concluded that the entailment-based test is the most suitable as a general diagnostic for focus-sensitivity in a cross-linguistic investigation. The truth-based test presupposes a construction of a suitable context against which the truth value of target sentences can be judged, which is not possible a priori in a situation where the researcher is yet to uncover the precise lexical semantics of the target predicate. The coherence-based test suffers from a confound arising from the ambivalent nature of the denial expression used in the test. The outcome of the test varies depending on whether the denial expression targets falsity or infelicity, which makes it difficult to formulate the test in a cross-linguistically general manner. The entailment-based test, on the other hand, is free from these challenges, and can constitute a test format that is general with respect to both predicates and languages. We have also discussed the results of applying the entailment-based test to a small sample of predicates in English and Spanish, highlighting in particular that more predicates are focus-sensitive according to the test than has been assumed in previous work.

We would like to conclude this paper by comparing the general methodological position that underlies our proposal with the methodological positions that are most commonly taken in semantic fieldwork and in experimental semantics, respectively. We believe our position is relatively unique in that it combines practices from semantic fieldwork with ones from experimental semantics. Although elicitation of judgements concerning entailment is not commonly used in semantic fieldwork (cf. Matthewson, 2004), it is commonly used in current experimental semantics and more generally in computational linguistics (e.g., Dagan et al., 2006; White and Rawlins, 2018b; Degen and Tonhauser, 2022). In this sense, our position is in line with a large body of work in experimental semantics. At the same time, however, our methodology drastically differs from standard practices in experimental semantics and is closer to fieldwork semantics in emphasizing the importance of *qualitative* judgments. In our methodology, the entailment-based test is an initial prompt that facilitates a discussion between the researcher and the consultant about the precise nature of the consultant’s judgment about entailment (or lack thereof). If the consultant judges the entailment to hold, the researcher may ask the consultant whether they have considered certain specific contexts. If the consultant judges the entailment not to hold, the researcher may ask in which concrete contexts the entailment breaks. Such qualitative judgments are typically not part of the data gathered in experimental semantics, and in this respect, our methodology aligns more with fieldwork semantics.

Our general methodological choice is rooted in our belief that the traditional semantic notion of inference/entailment is a useful primitive notion that can be insightfully investigated in cross-linguistic data collection (in line with experimental semantics). At the same time, it would be counterproductive to treat native speaker consultants as ‘subjects’ who only provide raw judgments because—we believe—they can provide qualitative data that are theoretically informative about what underlies those judgments (contra standard practice in experimental semantics; and also contra some claims in the fieldwork semantics literature (see Louie, 2015)). We hope to have shown that cross-linguistic investigation of focus-sensitivity is a domain where this hybrid methodological position is particularly suitable.

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