

# Sources of Context-Dependence: The Case of Knowledge Ascriptions\*

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This paper has two goals. The first is to defend a form of context-dependence for knowledge ascriptions. In particular, I shall develop and defend a version of *question-sensitivity* for knowledge, building on work of Schaffer, Szabó, and Knobe. I shall explore in depth some of the evidence in favor of question-sensitivity, and offer an account of the semantics and pragmatics of knowledge ascriptions that captures it. I shall thus, to an extent, defend the context-dependence of knowledge ascriptions.

The second goal of this paper is to explore the different sources of context-dependence that natural language provides, and the variety of forms of context-dependence that these sources produce. In particular, using knowledge ascriptions as an illustration, I shall argue that there are two very different sorts of sources of context-dependence in language. One is highly specific, typically lexical context-dependence. We discover that some specific word or specific class of words is context-dependent. The other is general. As I shall illustrate below, highly general features of extremely broad categories of expressions, and other general apparatus at work in language, can create context-dependence that is only minimally associated with any one expression or lexically determined class of expressions. The case of knowledge ascriptions provides an example of this kind of context-dependence. It shows how general features of the semantics of operators, and general features of how questions influence discourse, create context-dependence.

Both general and specific forms of context-dependence are well-documented. The case of knowledge ascriptions is useful for exploring them, as it highlights the fundamental

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difference between the two sorts. Both are of great linguistic interest. Like much we discover in the study of language, the difference between the two illustrates how lexical and other kinds of grammatical factors can divide linguistic labor. I claim that we see that as much with context-dependence as with syntax, argument structure, or any other linguistic phenomenon.

When it comes to philosophical concerns about contextualism, the difference points to something not always fully noted. In many cases, as I shall discuss more below, specific instances of context-dependence can reveal something important about the specific concept a given word expresses. General context-dependence does this in at best in highly limited ways.

My defense of the context-dependence of knowledge ascriptions will show it to exhibit only general context-dependence. Thus, it is a very limited defense of contextualism. I shall argue that the source of context-dependence in question-sensitivity is not the lexical meaning of *know*, but rather the general mechanisms related to the semantics and pragmatics of questions and focus. Thus, we have only general context-dependence. I shall speculate that in the end, this is too weak to support substantial epistemological conclusions.

The discussion of varieties of context-dependence will come at the end of this paper. First, we will explore the sources of context-dependence for question-sensitivity in detail. The structure of the paper is as follows. We will introduce question-sensitivity in section 1. We will need some substantial linguistic background, which will be provided in section 2. With that, we will examine question-sensitivity closely in section 3. We will build up a semantics and pragmatics for question-sensitivity in section 4. With all that in place, we will see how a form of context-dependence is present in knowledge ascriptions in section 5. But we will also see there that the kind of context-dependence we have uncovered is general, and not specific. We will discuss how different sources create these different kinds of context-dependence, and what the difference between the two kinds shows, in section 6.

## 1 The Phenomenon of Question-Sensitivity

Before turning to semantic, I shall review the case for a special kind of context-dependence for knowledge, drawing on work of Schaffer (2004, 2005, 2007), Schaffer & Knobe (2012), and most importantly, Schaffer & Szabó (2014). This offers a distinctive kind of context-dependence for knowledge ascriptions, relating to questions and answers to them.

The traditional form of context-dependence for knowledge ascriptions is sometimes called *stakes-sensitivity*. Work of Cohen (1999) and DeRose (1992), and work of Lewis (1996), argued that we see context-dependence in knowledge ascriptions relating to how high the stakes for a knowledge claim are. So, in DeRose's (1992) bank case, it is argued that we have:

- (1) Low Stakes Context: We are driving home on Friday afternoon, and planning to stop at the bank to deposit a check. We pass the bank and see a long line. It

is not especially important whether the check is deposited immediately. Our dialog goes:

- a. Maybe the bank won't be open tomorrow.
  - b. No, I know it will be open. I was just there two weeks ago on Saturday.
- (2) High Stakes Context: Same as above, except, we have a large check outstanding. It will bounce if we do not make the deposit. Our dialog goes:
- a. Do you know the bank will be open tomorrow? Banks can change their hours.
  - b. Well, no. I don't know it will be open.

Many judge that both of the (b) answers sound true. As they differ in whether the speaker knows the bank will be open, this sort of example appears to support the context-dependence of knowledge ascriptions. It appears that it is the stakes of the context that is important to changing the truth value of a knowledge ascription.

Despite its obvious appeal, stakes-sensitivity has been subject to extensive criticism. The intuitions surrounding it are quite delicate, and attempts to confirm them empirically have not been very successful. (See the extensive survey in Schaffer & Knobe (2012).) Furthermore, as a semantic proposal, it lacks any explanation of the mechanism of context-dependence (cf. Stanley 2005). Finally, as a substantial epistemological proposal (as opposed to a semantic one), stakes-sensitivity has met a number of objections (e.g. Hawthorne 2004; Reed 2010). For the current discussion, I shall simply follow these trends, and assume that there is no context-dependence of knowledge ascriptions from stakes-sensitivity.

But I do think there is some context-dependence. The kind I shall focus on is question-sensitivity, following Schaffer & Szabó (2014), as well as Schaffer (2004, 2005, 2007). This work focuses on examples like the following:

- (3) Context: Claire has stolen the diamonds. Ann and Ben are wondering who stole the diamonds, and Ann finds Claire's fingerprints all over the safe. So Ann says to Ben:
- a. I know that Claire stole the diamonds.
- (4) Context: Claire has stolen the diamonds. Ann and Ben are wondering what Claire stole, and Ann finds Claire's fingerprints all over the safe. So Ann says to Ben:
- a. I know that Claire stole the diamonds.

Here we do get fairly firm judgments that (3a) is true, while (4a) is false. This is backed up by some experimental work (Schaffer & Knobe 2012).

I think it is fair to assume there is a genuine phenomenon here. It does indicate context-dependence, as across two different contexts we get different truth values. But it also

seems much different from stakes-sensitivity. Call the phenomenon we see here *question-sensitivity* (following Schaffer and Szabó).

I shall assume question-sensitivity is a fact. But that still leaves open many issues. We have yet to see for certain that question-sensitivity indicates a form of contextualism about knowledge ascriptions. If it does, how does *know* become context-dependent? I shall explore this by first examining the phenomenon in more depth, and then by pursuing a contextualist account of it. I shall then ask what kind of results this account gets, and if they are right. But before that, some background for our discussion is needed.

## 2 Some Background

Our first task is to try to understand better what is at work in the question-sensitivity scenarios. But to do this, we will need some apparatus. The first piece of apparatus we will need is focus, and its role in regulating questions and answers.

Questions and answers are sensitive to *focus*: usually marked by intonational prominence.<sup>1</sup> This is illustrated by:

- (5) Does Max want coffee or tea?
- a. Max wants COFFEE.
  - b. # MAX wants coffee.

The different intonational prominences marked by capital letters mark different foci.<sup>2</sup> Focus triggers a felicity condition called question-answer congruence, as we see with:

- (6) Does Max want coffee or tea?
- a. Max wants COFFEE.
  - b. # MAX wants coffee.
- (7) Who wants coffee?
- a. # Max wants COFFEE.
  - b. MAX wants coffee.

A sentence is only felicitous if the focus marks an appropriate answer to a question. The focused material itself is usually understood as providing the new information that makes the answer informative.

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<sup>1</sup> See the surveys of Beaver & Clark (2008), Büring (2016b), and Kadmon (2001), as well as seminal work of Jackendoff (1972) and Rooth (1985, 1992).

<sup>2</sup> The marking ‘#’ indicates judgments of infelicity, a form of degraded acceptability.

The intonational prominence marking focus is sometimes called ‘stress’. As we will not be going into the phonology, that is fine, but I should pause to note that most phonologists do not identify it as stress, but rather a distinct kind of intonational contour. This is often labeled a ‘pitch accent’ (or just ‘accent’).<sup>3</sup>

One further fact about focus, that will become important as we go forward, is that different placements of pitch accent make different sentences. It is a standard view that the intonational prominence marking focus realizes a syntactic feature, which we can write as *F*. So a more full representation of the examples above is:

- (8) Does Max want coffee or tea?
- a. Max wants [COFFEE]<sub>*F*</sub>.
  - b. # [MAX]<sub>*F*</sub> wants coffee.
- (9) Who wants coffee?
- a. # Max wants [COFFEE]<sub>*F*</sub>.
  - b. [MAX]<sub>*F*</sub> wants coffee.

The different focus placements thus make different sentences, not just different ways of pronouncing the same sentence.

Let me mention a few of the many reasons this is the standard assumption. One is that there are clear relations between accent placement and syntax. As Selkirk (1995) observed, there is a preference for a phrase to be marked by an accent on its internal argument, and not its head.<sup>4</sup> There is also a much-discussed phenomenon of ‘second occurrence focus’, where semantically a focus is present, but no pitch accent is recognized (Beaver & Clark 2008; Beaver et al. 2007; Partee 1991). Also, it is an old observation that focus affects grammaticality (Jackendoff 1972). More recently, important connections between focus and ellipsis have been explored (Merchant 2001; Rooth 1992). A number of authors have noted the role of focus in the syntax of copular clauses (e.g. Heycock & Kroch 2002). The persistent connections between syntax, focus, and accent placement make a general case that there is a syntactic feature realized by accent in focus. Finally, there are big-picture reasons to see accent as realizing a syntactic focus feature. Many models of how syntax relates to semantics and phonology hold that semantics and phonology cannot see each-

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<sup>3</sup> Technically, pitch accents are distinctive parts of an intonational phrase marking specific combinations of local maxima or minima in the pitch contour. There is some dispute about whether the pitch accents or larger intonational phrases make up the realization of focus. For some surveys of relevant aspects of phonology, see Büring (2016b), Kadmon (2001), Ladd (1996), and Pierrehumbert & Hirschberg (1990).

<sup>4</sup> This is the phenomenon usually called focus projection. Theories have changed since Selkirk’s seminal work, due to the influence of Schwarzschild (1999). For overviews, see Beaver & Clark (2008), Büring (2016b), or Kadmon (2001).

other, and so there must be features in the syntax before phonology and semantics split that can affect both. All together, these pieces of evidence, and others, have led to the standard assumption that focus is marked in syntax and realized in some languages by accent.

The relation of focus to questions is made more clear if we think of each assertion as trying to answer a question, called the *question under discussion* (QUD) (Roberts 1996). The QUD is the immediate question we are trying to answer with an assertion. This is equivalent to a notion of discourse topic.<sup>5</sup> A QUD can be overt, set by a question. Typically it is part of a larger structure of questions and answers describing an inquiry (Büring 2003; Roberts 1996). When not overt, it can be set implicitly by context. Either way, the QUD is part of context, set either by discourse or other features of the context.

The examples above show that typically focus requires congruence with the immediate QUD (Roberts 1996). This is a felicity condition, relating a sentence to a particular feature of context. But, there is a complication we should mention, if just to set aside. Our main focus here will be on sentences embedded under *know*. With attitude reports in general, and with *know* in particular, the conditions under which a focus in an embedded sentence must match an immediate QUD gets rather complicated.

Attitudes come in flavors: ‘emotive’ (*glad*, etc.) and ‘cognitive’ (*know*, etc.) Many attitude verbs, including emotives, are highly restricted in question-answer congruence (Hooper 1975; Rooryck 2001a, b; Simons 2007). *Know* actually has a very delicate distribution:

- (10) Who stole the diamonds?
- a. I think that [Claire]<sub>F</sub> stole the diamonds.
  - b. ? I know that [Claire]<sub>F</sub> stole the diamonds.
  - c. # I’m glad that [Claire]<sub>F</sub> stole the diamonds.

This shows that when an embedded clause can be taken as a felicitous answer to a QUD is delicate. As we will look at embedded clauses in knowledge ascriptions, a few observations are in order. Following Simons, we can speculate that attitudes that serve an *evidential* function allow an embedded clause to answer a QUD. In these cases, the embedded clause rather than the matrix attitude verb clause provides the ‘main point’ of the utterance, and the attitude signals evidential status for the embedded clause. Emotives do not do this, and hence their limited distribution. *Know* only appears to do this in fairly special circumstances, when the strong epistemic commitment to knowledge indicated by *know* is non-redundant.

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<sup>5</sup> For some overview of the many ways of thinking about discourse topics, see the surveys of Büring (2016a) and Roberts (2011), and the extended discussions in Büring (2016b) and Kadmon (2001).

Fortunately, it seems our above ‘theft’ contexts (3) and (4) build this condition in, and so allow the embedded clause to answer the immediate QUD. Thus, for our purposes here, we can safely assume that a focus needs to be congruent to some reasonably nearby question recoverable from the context, and not worry about whether it is the immediate QUD. Even if less than fully accurate, this assumption is safe enough.<sup>6</sup>

We will also need some background about questions, focus, and presupposition as we go forward. It is a vexed question whether questions carry existential presuppositions. We often see a strong intuition that they do:

- (11) a. Who stole the diamonds?  
b. Presupposes that someone did?

But this can be made to disappear:

- (12) a. Who stole the diamonds?  
b. No one did. They are on loan.

It is controversial whether there is some kind of cancelation effect here, or if there was no presupposition at all.<sup>7</sup>

Our concern is how much this sort of presupposition might play a role in question-sensitivity. But, we can control for it, simply by using over presupposition suspenders (Horn 1972):

- (13) Who, if anyone, stole the diamonds.

With the addition of the suspender *if anyone*, the presupposition appears clearly to be gone.

It has also been a vexed issue whether focus carries an existential presupposition. I shall suppose it does not. I think this the dominant view (e.g. Jackendoff 1972; Rooth 1999). But it remains controversial (e.g. Herburger 2000). I think the most easy way to see why many think focus does not carry an existential presupposition is to contrast it with clefts, which do carry a real existential presupposition:

- (14) Did Sam kiss anyone?  
a. Sam kissed [Kim]<sub>F</sub>.  
b. # It is [Kim]<sub>F</sub> who Sam kissed.

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<sup>6</sup> There are also issues about where accents should fall in embedded clauses, which I shall ignore.

<sup>7</sup> Classic positions on this matter come from Groenendijk & Stokhof (1984) and Karttunen & Peters (1979), but the literature is rather large.

- (15) Did anyone win the football pool this week?
- a. Probably not, because it is unlikely that [Mary]<sub>F</sub> won it, and she is the only person who ever wins.
  - b. # Probably not, because it is unlikely that it was [Mary]<sub>F</sub> who won it, and she is the only person who ever wins.

(Example (15) is from Rooth (1999).) In light of these observations, we will assume question-answer congruence does not automatically require existential presupposition, and try to control any suggestion otherwise explicitly with suspenders.

We now have some tools we can use to investigate question-sensitivity more carefully. It is to that task we now turn.

### 3 The Ingredients of Question-Sensitivity

Let us return to our example of question-sensitivity. First, recall the two contexts involved:

- (16) a. **Context 1:** Claire has stolen the diamonds. *Ann and Ben are wondering **who stole the diamonds***, and Ann finds Claire's fingerprints all over the safe.
- b. **Context 2:** Claire has stolen the diamonds. *Ann and Ben are wondering **what Claire stole***, and Ann finds Claire's fingerprints all over the safe.

We can now confirm that these are really two different contexts, as they set up different QUDs.

But we also have a problem. We also have two distinct target sentences, because of question-answer congruence:

- (17) Context 1. QUD: Who stole the diamonds?
- a. I know that [CLAIRE]<sub>F</sub> stole the diamonds.
  - b. # I know that Claire stole [the DIAMONDS]<sub>F</sub>.
- (18) Context 2. QUD: What did Claire Steal?
- a. # I know that [CLAIRE]<sub>F</sub> stole the diamonds.
  - b. I know that Claire stole [the DIAMONDS]<sub>F</sub>.

The felicitous sentences for these contexts require different foci, and so are distinct sentences.

There is a further problem we might worry about: Are we smuggling in existential presuppositions for the QUDs? Are we thus smuggling in facts about what is known, which affect truth values but are not relevant to context-dependence?



To try to address these, we will look at the examples again, but be more careful about the ingredients of the two contexts, including QUDs, presuppositions of questions, and assumptions about knowledge. And, we will also be more careful about how we divide up context and truth-supporting circumstances.

First, let us try to enumerate the facts about the world that are common across contexts (1) and (2). To attempt this, we can first try to take the descriptions given in Schaffer & Knobe (2012) and Schaffer & Szabó (2014), and fill in everything we might infer that is common across those contexts. This exercise produces a list that looks something like:

1. Claire stole the diamonds.
2. The diamonds are stored in the safe.
3. Other things are also stored in the safe.
4. The diamonds are not now in the safe.
5. Claire's fingerprints are on the safe.
6. No one else's fingerprints are on the safe.

Looking at how we judge truth values for knowledge claims in these contexts, it appears we also take finger prints to provide sufficient evidence in some cases. This is not simple to put in an epistemologically neutral way, but let us add:

7. Fingerprints are sufficiently reliable evidence.

Call these features  $F$ .  $F$  constitutes a very rough list of the initial facts about the world as described in contexts (1) and (2), excluding facts about who believes or knows what.

I should pause to stress that it is not clear if  $F$  constitutes a complete enumerate of the relevant facts, and item (7) in particular will generate some questions about how we reach truth value judgements as we go forward.  $F$  is merely a rough enumerate of what seems to be at work in our judgements and is common across contexts (1) and (2). It will give us a starting point for understanding how truth values can turn out the way we judge, once we have a clear understanding of the contents of the target assertions.

So,  $F$  gives us some idea what the facts might be. We also need a clearer representation of the two contexts. To do this, it will be helpful to identify what is *common ground* in the conversation. This provides a good representation of a context, though it does not tell us what features of it are semantically relevant or how. At the beginning of the discourse, we can take all of (2–7) to be common ground for Ann and Ben. But (1) cannot be common ground for them. All that it looks like Ann and Ben presuppose is that some stealing took place. Adding this to (2–7) gives us the initial common ground. Call this  $B$ .  $B$  is a set of Base features which will be common across the contexts we will consider.

$B$  is the common ground, and so a substantial portion of the context as it stands at the beginning of the discourses that go into both (1) and (2). Of course, in both cases, we have assertions, which add to common ground, and make facts explicit. We can assume that for

both contexts, it becomes common ground that Ann believes Claire stole the diamonds. Call this  $BA$  (for Base with Addition). We might also note that when Ann's assertions are accepted, then the fact that Claire stole the diamonds gets accommodated. But we will not actually need this given how we model things. When it comes to assessing the assertions in our two contexts, we can assume they are both made in contexts including  $BA$ , and that we assess them for truth against facts including  $F$  plus the fact that Ann believes Claire stole the diamonds. Call this  $FA$ .  $BA$  and  $FA$  give us initial indications of the needed facts and contextual inputs. It reflects what we assume as we reason about contexts (1) and (2).

$BA$  is not yet a full context, as it does not specify a QUD, what is presupposed about the QUD, and what is taken as known about it. In looking at how to complete our contexts, we will focus on two sorts of ways of doing so: weak and strong. Weak and strong will characterize information that is active in a context over and above  $BA$ . Contexts can be weak or strong epistemically, or in terms of what their QUDs presuppose.

Let us start by looking at *who*-contexts, involving QUDs related to *Who stole the diamonds?*. And, let us begin with weak forms. Our contexts can be epistemically weak, in that Ann and Ben do not know for sure that the diamonds were stolen. They can also have presuppositionally weak QUDs, in that their QUDs are not taken to carry an existential presupposition. Call a context that is both epistemically and presuppositionally weak  $BAE^-Q^-$  ( $E^-$  for epistemically weak,  $Q^-$  for a QUD without an existential presupposition). In this case, we have:

- (19) Context for  $BAE^-Q^-$ -*who*: Ann and Ben suspect that the diamonds were stolen. Ben asks *Who, if anyone, stole the diamonds?* Ann finds Claire's fingerprints all over the safe.

This context is built from the common ground  $BA$ , and the QUD *Who stole the diamonds*, but explicitly canceling any existential presupposition, and not assuming specific knowledge that the diamonds were stolen.

The judgments we get related to question-sensitivity for this context are:

- (20) Context  $BAE^-Q^-$ -*who*.
- a.  $T/G$ [Claire] $_F$  stole the diamonds.
  - b.  $T$ I believe that [Claire] $_F$  stole the diamonds.
  - c.  $F$ I know that [Claire] $_F$  stole the diamonds.

A few comments. These judgments are supposed to be of what we think is expressed in  $BAE^-Q^-$ -*who*, assessed against  $FA$ . (a), marked  $T/G$ , sounds fine to me, and seems true. But there may be some issues about whether Claire violates a Gricean maxim because she asserts more than she has good reason to, or maybe she violates a norm of assertion (if you like knowledge norms). The marking  $T/G$  indicates the possible Gricean effect. (c) is false. Ann's evidence is some fingerprints, which does not suffice to rule out that no one stole the diamonds. Maybe Claire took out some rubies to display, while Tim, wearing gloves, stole some sapphires.

We can also look at strong contexts for the *who*-QUD. Strong contexts have a strong QUD with an existential presupposition, and the agents know that the presupposition is satisfied. This makes a strong context  $BAE^+Q^+$ . In the strong *who*-case we have:

- (21) Context for  $BAE^+Q^+$  who: Ann and Ben know that someone stole the diamonds. (They are being ransomed by a third party.) Ben says, OK, *we know the diamonds were stolen, but who stole them?* Ann finds Claire's fingerprints all over the safe.

This context builds on the same base  $BA$ . It adds the same QUD, but with no overt cancelation of any presupposition. And, it adds as a presupposition that it is known the diamonds were stolen.

The judgments we get here are:

- (22) Context  $BAE^+Q^+$  who.
- a.  $^T$ [Claire]<sub>F</sub> stole the diamonds.
  - b.  $^T$ I believe that [Claire]<sub>F</sub> stole the diamonds.
  - c.  $^T$ I know that [Claire]<sub>F</sub> stole the diamonds.

Importantly, (c) changes status, as the evidence directly implicates Claire.

I take these judgments to be fairly clear, and supported by experimental work (cf. Schaffer & Knobe 2012). We should note, and will return to later, the question of what truth-supporting circumstances are used for these judgments. It is a combination of  $FA$ , and in the strong case, added information about what is known.

There are some intermediate cases:  $BAE^+Q^-$  and  $BAE^-Q^+$ .  $BAE^+Q^-$  is odd: we explicitly try to cancel something we already take as known. I will ignore this case.  $BAE^-Q^+$  turns out very messy. Take, for instance its *who*-version:

- (23) ? Context for  $BAE^-Q^+$  who: Let's suppose, though we don't know for sure, that someone stole the diamonds. Who stole them?
- a.  $^T$ [Claire]<sub>F</sub> stole the diamonds.
  - b. ?? I believe that [Claire]<sub>F</sub> stole the diamonds.
  - c. #/?? I know that [Claire]<sub>F</sub> stole the diamonds.

I think the latter two are bad, though the (c) sentence seems worse to me. But the judgments seem to me unclear, as the question in the set-up context seems bad. Especially for (c), I think we see the effect Simons (2007) observed about when our answers with *know* are acceptable. It requires emphasis on evidential standards and a high standard. But then, any evidential claim made against a presupposition understood to be mere supposition is not adequate.

We also need to look at contexts with a *what*-QUD: *What did Claire steal?*. Let us start with a weak *what*-context:

- (24) Context for  $BAE^-Q^-$  what: Ann and Ben suspect that Claire stole something. Ben asks *What, if anything, did Claire steal?* Ann finds Claire's fingerprints all over the safe.
- a.  $G/T$ Claire stole [the diamonds]<sub>F</sub>.
  - b.  $T$ I believe that Claire stole [the Diamonds]<sub>F</sub>.
  - c.  $F$ I know that Claire stole [the diamonds]<sub>F</sub>.

The Gricean effect for (a) seems stronger than in the *who*-context. More importantly, we still get a clear false judgement for (c).

Now let us look at the strong context:

- (25) Context for  $BAE^+Q^+$  what: Ann and Ben know that Claire stole something. (She confessed.) Ben says *OK, we know Claire stole something, but what did she steal?* Ann finds Claire's fingerprints all over the safe.
- a.  $G/T$ Claire stole [the diamonds]<sub>F</sub>.
  - b.  $T$ I believe that Claire stole [the diamonds]<sub>F</sub>.
  - c.  $F$ I know that Claire stole [the diamonds]<sub>F</sub>.

Crucially, the truth value of (c) is still false, in contrast to the behavior in *who*-environments.

Our key data is this. In strong contexts:

- (26) a. Context  $BAE^+Q^+$  who.  
 b.  $T$ I know that [Claire]<sub>F</sub> stole the diamonds.
- (27) a. Context  $BAE^+Q^+$  what.  
 b.  $F$ I know that Claire stole [the diamonds]<sub>F</sub>.

We have different truth values for the two target sentences.

We also have what I call *the flip*:

- (28) a. Context  $BAE^-Q^-$  who.  
 b.  $F$ I know that [Claire]<sub>F</sub> stole the diamonds.
- (29) a. Context  $BAE^+Q^+$  who.  
 b.  $T$ I know that [Claire]<sub>F</sub> stole the diamonds.

It is the flip that generates the contrast we see in strong contexts. It shows that while in the weak *who*-context our target sentence is false, in the strong context it comes out true.

I take these data points to be the core phenomenon of question-sensitivity. Question-sensitivity is not simple. The contexts that show it can differ in many ways, including QUDs, presuppositions, and what is known in the contexts. We also have two different sentences in our original example of question-sensitivity.

Our examination of the phenomenon of question-sensitivity allows us to make a *prima facie* case for the context-dependence of knowledge ascriptions, but it is one we will have to revisit and reconsider as we proceed.

Here is a highly sketchy version of a case for context-dependence. The main difference between our two contexts is a difference in QUD. This is indeed a feature of context. It leads to a shift in truth values. Hence, we have context-dependence.

We already know this is not quite right, and we need to make the *prima facie* argument with more care. Our two different contexts involve two different sentences, differing in focus placement. So, we cannot pretend we have one sentence changing truth value in different contexts.

But we can still make a *prima facie* case, assuming that *FA* is an accurate representation of the truth-supporting circumstance, and *BA* is an accurate representation of the elements common across the contexts. Assuming this, we recall that our judgments led us to conclude that:

(30)  $\llbracket \text{I know that [Claire]}_F \text{ stole the diamonds} \rrbracket^{BAE^+Q^+\text{who}}$

$\neq$

$\llbracket \text{I know that Claire stole [the diamonds]}_F \rrbracket^{BAE^+Q^+\text{what}}$

After all, our judgement for the first is true, and the second false, so the two must differ in truth conditions. Now, we can ask where that difference in truth conditions can come from? The difference between the contexts involves only QUDs, and the difference between the sentences only focus. So, the difference in truth conditions must be generated by the semantics of focus, set by QUD. So, *know* must be sensitive to these differences in a way that generates different truth conditions. Thus, we conclude, *know* is context-dependent, with context-dependence mediated by focus.

This is less than a direct argument: it is more a proposal about how best to explain the phenomenon. But, there is an alternative available: deny *FA* is sufficient to fix truth values. After all, in the strong  $E^+$  contexts, we add claims about what we know. And they are different in the different contexts: one is knowledge that diamonds were stolen, while the other is knowledge the Claire stole something. We supposed, roughly, that finger prints are reliable evidence (number 7 of *F*), but how we evaluate that evidence, and what we can conclude from it, will at best depend on much of the background of what else we know. So, we might simply conclude that it is not *FA* against which we assess truth, but a much richer

epistemic range of facts. If so, then we do not need context-dependence to explain our results. It is simply a change of facts leading to a change of truth values.

What of the appearance of context-dependence? We might explain this away as what is called a weak effect of focus: a discourse effect not leading to truth-conditional differences. The existence of a non-truth-conditional discourse effect from focus, and change of facts hidden under a QUD could create an appearance of context-dependence, even if there is none.<sup>8</sup>

So, we have two different views. One offers at least a *prima facie* case for context-dependence, the other does not. Which of these arguments is right? I shall claim they are each half-right. There is some genuine context-dependence at work, and I shall argue for it indirectly, by laying out a good semantics that shows how it works. But, there is still an issue about what goes into the truth-supporting circumstances, that indicates weaker effects of context than the *prima facie* argument might suggest.

Looking at the phenomenon, the key issue is what explains the flip. Is it driven by context-dependence, or by facts about truth-supporting circumstances? I shall argue that the context-dependence we will uncover does not fully explain the flip. Thus, though there is a case to be made for context-dependence, it is not the full story about question-sensitivity.

I shall argue this as follows. I shall sketch a semantics which makes room for context-dependence. With that, we can look at how it captures the key data for of question-sensitivity, and see where other explanations are needed.

## 4 Semantics and Context-Dependence

To carry this out, we first need to work with the semantics of *know*, and then look at how it can be context-dependent. I shall address these in that order.

### 4.1 Semantics

Our first goal is to build a not-too-terrible semantics for *know*. Schaffer & Szabó (2014) build an interesting semantics, relying on an analogy with adverbs of quantification. I shall build a variant, which gets similar results, but is more in keeping with the semantics of other attitude verbs. I shall briefly ask whether we can tell which variant is better as we proceed.

Let us start with a fairly standard semantics for attitude verbs. The usual starting place is work of Hintikka (1969). Hintikka's idea is that an attitude verb is interpreted as the set of worlds compatible with subject's attitudinal state:

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<sup>8</sup> This comes closer to the original way Schaffer formulated the idea of *contrastive knowledge*.

- (31) a.  $S_A(x)(w) = \{w' : w' \text{ is compatible with } x\text{'s } A\text{-attitude in } w\}$   
 b.  $\llbracket \text{Att-V} \rrbracket^c = \lambda P \lambda x \lambda w. S_A(x)(w) \subseteq P$

Of course, this is simplified, ignoring *de se* effects, and so on, and the long tradition of belief puzzles. But it offers a useful starting-point for the semantics of attitudes. Specifically for belief, the relevant attitudinal state is the speaker's belief state, labeled *DOX* (for doxastic state). We thus have:

- (32)  $\llbracket \text{believe} \rrbracket^c = \lambda P \lambda x \lambda w. DOX(x)(w) \subseteq P$

This is a useful initial semantics for belief, though of course, much has been done since Hintikka's work.

One important observation we can make already with this semantics is that it shows no context-dependence for *believe*. *DOX* is fully determined by the speaker's state, and there is thus no room for context-dependence. There might be some weak question-answer effects from focus, but they cannot be truth-conditional, if this semantics is on the right track.

But other attitudes show more context-dependence, and we can model it with the same basic approach. Consider *glad*, which shares some properties with *know*. *Glad* is an 'emotive factive'. It has a few salient features:

- (33) a. Presupposes its complement (like *know* is often assumed to).  
 b. Attitude is emotive (different from *know*, which is evidential in some way).

We can follow von Stechow (1999) and Heim (1992) to provide a Hintikka-style semantics for emotives. This builds on the standard Kratzer (1977) semantics for modals. As is well known, the Kratzer semantics provides two contextual parameters:

- (34) a. Modal base. A function  $f(x, w)$  from individuals and worlds to sets of worlds. (The worlds accessible from  $w$  for  $x$ .)  
 a. Ordering source. A function  $g(x, w)$  to sets of propositions (sets of sets of worlds).

The ordering source allows us to define a partial ordering on worlds. Given any set of propositions  $X$  and worlds  $x, y$ , we set  $x \leq_x y$  iff for all  $p \in X$ , if  $x \in p$ , then  $y \in p$ . If we make the so-called limit assumption (e.g. Lewis 1973), this allows us to define a set of best worlds in a given set  $W$ :<sup>9</sup>

- (35)  $\max_g(W)$  is the set of  $\leq_g$ -best worlds.

Attitudes can be similar to modals, in quantifying over the right set of worlds. They can thus pick up the same context-dependence through these two parameters as modals can.

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<sup>9</sup> For a more full presentation, and many references, see Portner (2009).

But as we will see, there is much more lexical specification of the values of the parameters for attitudes.

As a warm-up to *glad*, let us start with *want* (von Stechow 1999; Heim 1992; Stalnaker 1984). For *want*, we need to pick an appropriate ordering source for preferences. Let  $g(x, w)$  be a set of propositions that characterizes what  $x$  prefers in  $w$ . We then have:

$$(36) \quad \llbracket \text{want} \rrbracket^c = \lambda P \lambda x \lambda w. \max_{g(x, w)}(f(x, w)) \subseteq P$$

You want  $P$  if all the worlds you prefer most are  $P$  worlds. There is more to say about this proposal, but it will suffice for now.

What is the right modal base for *want*? It appears it should be:

$$(37) \quad f(x, w) = DOX(x)(w)$$

This distinguishes *want* from *wish*. What I want in  $w$  is compatible with what I believe to be the case in  $w$ . *Want* does not require all the most desirable worlds to be  $P$  worlds, only those you believe are open. For instance, I might want to teach Tuesdays and Thursdays, even though the absolute best worlds are those where I am not teaching. To include this, we can add:

- (38)  $\llbracket \text{want} \rrbracket^c$ :
- a. Defined only if  $f(x, w) = DOX(x)(w)$
  - b. If defined,  $= \lambda P \lambda x \lambda w. \max_{g(x, w)}(f(x, w)) \subseteq P$

Again, this gives us a workable example of a semantics.

Now we can do *glad*. *Glad* adds factivity. There is a long debate about how to handle factivity in semantics. If a proposition  $P$  is the factive content, then the usual way is to require it be presupposed that  $DOX(x)(w) \subseteq P$ . This might be weaker than most epistemologists would assume, as it does not require the truth of  $P$ . It is standard in semantics, as most standard approaches to presuppositions cannot easily implement the stronger requirement. There are also some reasons in support of it. For instance, we have examples like:

- (39) John mistakenly thought it was Sunday and was glad he could sleep in.

I will simply follow the tradition and work with the weaker form.

We need more than a factive presupposition for *glad*. We also need to presuppose that  $DOX(x)(w) \subseteq f(x, w)$ . To make this vivid observe that if the modal base contained only worlds incompatible with what I believe, then selecting the best ones would not reflect my attitude. I'm glad when things as I see them work out ok.

But crucially, we cannot simply set  $DOX(x)(w) = f(x, w)$ . Suppose I got bitten by a mosquito and got Chikungunya. Then the best worlds in  $DOX$  are those where I get debilitating muscular problems, but live (the disease can cause severe muscular problems or death). But I am not glad I get debilitating muscular problems. There are nearby ways



things could have unfolded where I don't get infected from the bite. Those are better. (NB if we combine the condition that  $f(x, w) \cap P \neq \emptyset$  and  $f(x, w) \setminus P \neq \emptyset$  with the weak factivity presupposition that  $DOX(x)(w) \subseteq P$ , we also see that we cannot have  $f(x, w) = DOX$ .)

So (simplifying again), our semantics for *glad* is:

- (40)  $\llbracket \text{glad} \rrbracket^c$ :
- a. Defined only if:
    - i.  $DOX(x)(w) \subseteq P$
    - ii.  $DOX(x)(w) \subseteq f(x, w)$
  - b. If defined,  $= \lambda P \lambda x \lambda w. \max_{g(x, w)}(f(x, w)) \subseteq P$

This semantics makes the difference with *want* and *believe* clear. For *glad*, unlike *want* and *believe*, we have genuine context-dependence. For *want* and *believe*, lexical constraints fix the value of  $f(x, w)$  fully, as they set  $f(x, w) = DOX(x)(w)$ . But for *glad*, we only have  $DOX(x)(w) \subseteq f(x, w)$ . Context must contribute something more to fix the value of  $f(x, w)$ . Lexical meaning does constrain the value of this parameter, but it leaves it partly open for *glad*.

With all this background in place, we can build a semantics for *know*, following the model of other factive attitudes. We will wind up with a variant of the Schaffer & Szabó (2014) semantics, but by a very different route. And once we have it, we can apply it to the case of question-sensitivity. We have already seen that factive attitudes can open up space for context-dependence, and we will explore how that works with *know*.

When moving from emotive factives to knowledge, we need to think about evidence. Linguistically, our earlier observations about evidentials and questions and answers indicate this. We saw that evidentially oriented material can allow embedded main point questions. We get this most easily for *know* when a high degree of confidence is a relevant factor in discourse. Linguistics aside, it is of course an obvious epistemological idea that evidence is relevant to knowledge.

We will put the evidential component of *know* into the ordering source, where the preference ordering showed up for *glad*. (This makes the attitudes of different flavors, one emotive, the other cognitive.) To do this, we replace the set of propositions characterizing preferences with those that are *evidence* for agent  $x$  in  $w$ . Call this  $E(x, w)$ . In parallel with *glad*, the main idea is to rule out any world not compatible with all the evidence. Hence, we will require  $\max_{E(x, w)}(f(x, w)) \subseteq P$ .

*Know* is factive, and we need to presuppose factivity. As I mentioned earlier, I shall follow the linguistic tradition and encode this as  $DOX(x)(w) \subseteq P$ . This requires (more or less) that every world in the common ground is a  $P$  world, so it not a bad approximation, even if your epistemology might call for something stronger. As far as discourse goes, this often at least looks correct. If we all presuppose it is raining, and I say *I know I need an umbrella*, things look fine within the discourse, even if in fact we are wrong about it raining.

As with other attitudes we have looked at that are ‘not too counterfactual’, we need the modal base to include our belief worlds. So, we should have  $DOX(x)(w) \subseteq f(x, w)$ , just as with *glad*. As before, we allow more in the modal base, to allow some counterfactual reasoning. The requirement is most clear in cases of counterfactual reasoning coupled with *realis* assertions:

- (41) Let’s suppose one of us would teach aesthetics. That includes me, Jonathan, Zoltan, and Cody.
- a. I know Jonathan would teach aesthetics.
  - b. # I know Jonathan is teaching aesthetics.

We can reason about knowledge with worlds outside what we in fact believe. We need all our belief worlds to be present, but can go beyond them for *knows*.

Knowledge entails belief. As before, our current approach gets this as a bonus from factivity, as we have  $DOX(x)(w) \subseteq P$ .<sup>10</sup>

With all this, our semantics for *know* is:

- (42)  $[[\textit{know}]]^c$ :
- a. Defined only if:
    - i.  $DOX(x)(w) \subseteq P$
    - ii.  $DOX(x)(w) \subseteq f(x, w)$
  - b. If defined,  $= \lambda P \lambda x \lambda w. \max_{E(x,w)}(f(x, w)) \subseteq P$

This is like *glad* in many ways. It is a factive attitude. It has substantial context-dependence, via  $f(x, w)$ , just like *glad* does, as the modal base can go beyond *DOX*. The main difference is that we have switched from an emotive ordering source to an evidential one, *E*.

My main goal here is to provide a linguistically plausible semantics for *know*, that illustrates its context-dependence, and shows it to be similar to other attitudes. But there is a little bit of real epistemology here too. Schaffer and Szabó observe that a similar semantics can be seen as an implementation of a relevant alternatives theory (e.g. Dretske 1981; Goldman 1976; Lewis 1996; Schaffer 2005; Stine 1976). The idea is roughly that to know is to be able to rule out competing hypotheses. But not all possibilities are relevant, e.g. distinguishing zebras from cows is relevant, but not distinguishing them from carefully painted horses. The semantics just sketched implements a version of this.  $f(x, w)$  provides a contextually fixed domain of ‘relevant’ alternatives. *E* rules them out.

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<sup>10</sup> Schaffer and Szabó encode belief directly. This is one virtue of the approach to factivity I have taken here.

Insofar as the semantics works, this might be an indirect reason to prefer a relevant alternatives theory. But, it is a very weak reason. The abstract semantics does not say what in particular  $E$  is, beyond it being evidential. This allows that it could be something very different from the mechanisms relevant alternatives theories have in mind. The same goes for  $max$ . As we explore how context sets the value of  $f(x, w)$ , we will see standard mechanisms from semantics and pragmatics. It is not obvious if these provide the relevance assumed by relevant alternatives theories. So, we will think of the semantics in a relevant alternatives way, but not put much weight on it.

With our semantics, which makes some room for context-dependence, in hand, we can now look at how context can affect it.

## 4.2 Context-Dependence

We will see that, as question-sensitivity highlights, the main mechanism of context-dependence at work with attitudes like *know* is focus. In particular, it is a case of what is called *association with focus* (Rooth 1985), where focus has a truth-conditional effect. We will explore how our factive attitudes allow this. We will see that we have a case of what Beaver & Clark (2008) call *free association*. In cases like this, focus constrains the setting of a contextual parameter.<sup>11</sup>

The basic idea behind free association with focus is that when we have a generalization over a domain that is partly set by context, focus plays a crucial role in determining what is in that domain. In our cases, we have a contextual parameter  $f(x, w)$  partly set by context. Its value is constrained, as we have  $DOX(x)(w) \subseteq f(x, w)$ . But the value is not fully fixed by lexical meaning, so it must be partly set by context. Our semantics is one of universal quantification over worlds in  $f(x, w)$ , so  $f(x, w)$  functions as a restrictor. In such cases, we have the general phenomenon of free association with focus: focus links to questions that affect restrictors of operators.

The general phenomenon here is well-established. A wide range of operators with contextually restricted domains associate with focus, including adverbs of quantification, determiners, counterfactuals, etc. (e.g. Beaver & Clark 2008; Partee 1991). There have been a number of explanations offered over the years as to why and how this happens. Some early views simply say it is a lexically encoded feature of operators that associate with focus (Rooth 1985). Given how wide-spread the phenomenon is, it is more common these days to see it as derived from semantics-pragmatics interactions. So, for instance, Rooth (1992) and von Stechow (1994) argue that focus sets up anaphora with a focus value, which has the result of restricting domain parameters. Or, along the lines of Roberts (1996), it has been argued that association with focus is QUD driven. Question-answer congruence

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<sup>11</sup> Focus in attitudes has been studied by a number of authors, including Asher (1987), Beaver & Clark (2008), Dretske (1972), von Stechow (1999), Heim (1992), Jackendoff (1972), Kadmon & Landman (1993), and Simons (2007).

triggers some kind of pragmatic inference, triggering local accommodation of material into a restrictor.

I shall talk more about some of these theoretical options in a moment. First, let us see the end result. A QUD, appropriately restricted, provides a salient set of propositions  $C$ . This gives us a salient set of worlds  $\cup C$ . This restricts our set of available worlds  $f(x, w)$ , as we will need to have  $f(x, w) \subseteq \cup C$ . Pragmatics typically strengthens this to  $f(x, w) = \cup C$ .

To see where focus fits into this process, we need a little more detail on its semantics. Simplifying a lot, but following Rooth (1985, 1992), assign an *alternative set* to a sentence by varying the focused element, to give a *focus semantic value*. Our focus semantic value is marked by  $f$ , e.g.:

$$(43) \quad \llbracket [\text{Ede}]_F \text{ wants coffee} \rrbracket^f = \{ \llbracket x \text{ wants coffee} \rrbracket : x \in D_e \}$$

We also need a quick and dirty semantics for questions (borrowing from Groenendijk & Stokhof 1984 and Hamblin 1973), that makes the semantic value of a question the set of possible answers to it, varying the argument position of the *wh*-expression. Hence:

$$(44) \quad \llbracket \text{Who wants coffee?} \rrbracket = \{ \llbracket x \text{ wants coffee} \rrbracket : \text{person}(x) \}.$$

A more full semantics, among other things, allows for sortal restrictions. But the quick and dirty version will suffice for now.

It will be important as we go forward to allow a null element  $\emptyset$  to be among the values for questions and focus. This may be more natural in a setting where our variables range over generalized quantifier values. But it reflects the considerations we raised in section 2 about existential presuppositions, and reflects other substantial issues in the semantics of questions. Some of these could complicate the semantics, but adding  $\emptyset$  will give us a useful way to work with a simple semantics.

Now, we can ask more about how focus works. As Rooth (1992) observed, focus is essentially anaphoric. When  $S$  contains a focus, it requires a salient set  $C$  in the context such that  $C \subseteq \llbracket S \rrbracket^f$ .  $C$  provides a set of salient alternatives for the focus. We also build in some non-triviality requirements:  $\llbracket S \rrbracket \in C$ , and there is at least one other element of  $C$ .

What provides  $C$ ? Question-answer congruence. Question semantic values provide values for focus anaphora. The end result is then that in typical cases, focus semantic value = semantic value of the question under discussion. There are a few modifications we might note. For embedded clauses, we might have the focus semantic value of the clause containing the focus = semantic value of the immediate QUD. And of course, this is an oversimplification. We have not allowed for multiple foci, nor have we taken into account the possible complexity in the structure of questions and subquestions and how intonational prominence relates to them. But, we can work with the simple idea that focus is anaphoric on the QUD.

There is usually further domain restriction. Focus semantic values are big. We normally get anaphora on a contextually restricted part of the value, which in turn will map to a

contextually restricted part of a question value. But this still amounts to finding a contextually salient  $C$ .

There is a theoretical issue I shall mention, only to put aside. There are two ways of approaching a more detailed analysis of this effect. One is to take the anaphoric behavior of focus as basic, and derive question-answer congruence effects (e.g. Rooth 1992). The other is the reverse, which takes question-answer congruence to be a felicity condition and derive the anaphoric properties of focus (e.g. Roberts 1996). These are theoretically distinct options, but fortunately, we do not need to decide between them now.

There are a few other theoretical issues I shall mention briefly, and also set aside. Why, for instance, are restrictors specifically associated with focus? We see that when a restrictor is context-dependent, it needs to find a salient value. Focus affects how the value is set, and makes it anaphoric on the restricted QUD (e.g. Partee 1991). Slightly more specifically, the restrictor contains a variable, which is constrained to be anaphoric on whatever licenses focus in the nuclear scope. This the QUD (e.g. von Stechow 1994; Rooth 1992). But why does this happen? Luckily, we need not really decide. But here are a few ideas. As I mentioned, it may be simply part of the semantics of operators (Rooth 1985). It is more common these days to argue it is a pragmatic effect, and defeasible. It may just be that there are two context-dependent elements, looking for similar values, and they typically wind up being set the same way. Or, maybe we have local accommodation. Maybe general constraints on discourse force the restrictor, which is the local domain, to satisfy the focus requirement (Beaver & Clark 2008; Roberts 1996).

I have sketched some of the semantics and pragmatics of focus and QUD, to illustrate how they work. The main result, that will be important for us, is that when we have a contextually determined domain restrictor, it gets constrained by the QUD. Where  $C$  is the appropriately restricted value of the QUD, we typically have our restrictor constrained by  $\cup C$ .

Applying this to our semantics, in most cases, we will have  $f(x, w) = \cup C$ . This is the main effect of focus, and is the underlying reason for question-sensitivity. We also have a lexically set lower bound:  $DOX(x)(w) \subseteq f(x, w)$ . But  $f(x, w)$  remains context-dependent, and mechanisms of context-dependence have  $f(x, w)$  resolve to  $\cup C$  (which can often get us the lexical constraint for free). Focus and QUD are the main mechanisms that make this happen. The relation of QUD to focus creates question-sensitivity.

We now have at least a sketch of a semantics for *know* that allows for a context-dependent parameter, and a sketch of how that parameter gets set in context. I have provided a little extra information, to flesh out what the mechanism setting the parameter might be. But the important point is that we have a strong generalization about what value it takes in context, which we can use to look once more at question-sensitivity. That will be our task in the next section.

### 4.3 The Schaffer-Szabó Semantics

Before doing that, I shall pause to compare the semantics I sketched here to the one developed by Schaffer and Szabó. The same line of reasoning I have followed here led them to a slightly different proposal.

Their proposal treats *know* as an adverbial. Adverbials are known to associate with focus, and are in important ways similar in structure to modals. A version of their semantics is something like:

$$(45) \quad \llbracket \text{know} \rrbracket^c = \lambda P \lambda x \lambda w. ((\cap E(x, w)) \cap (\cup C)) \subseteq P \wedge \\ x \text{ truly believes } P \text{ on the basis of } E(x, w)$$

This is not quite their form. Semantics for adverbs is usually done in terms of situations (Berman 1987; von Stechow 1994; Kratzer 1989). Schaffer and Szabó follow suit. Also following the tradition on adverbs, they assume a distinct semantic argument which can be filled by an overt restrictor (an *if* or *when*-phrase). I doubt these matters at the level of detail we are working at. The significant difference as I see it is that they add the separate clause: *x* truly believes *P* on the basis of her evidence in *w*.

Are the two semantics equivalent? They are very close. The emotive factive model put in a kind of factive presupposition as a definedness condition, but Schaffer and Szabó could do this as well. My semantics gets belief for free. But it only does so because of the particular way we implemented the factive presupposition. So, it is not clear if this is a benefit or not. Actually, there is another option for deriving belief. Assume a version of 'you believe your evidence', i.e.  $DOX \subseteq \cap E$ . Then  $DOX(x)(w) \subseteq f(x, w)$  and  $DOX(x)(w) \subseteq \cap E(x, w)$ , so  $DOX(x)(w) \subseteq \max_{E(x, w)}(f(x, w)) \subseteq P$ . (We might worry if this assumes more closure than we might want?)

I thus take my semantics to be largely a variant of that in Schaffer & Szabó (2014). There are small differences, which are worth further exploration, but substantial similarity.

## 5 Predicting and Explaining Question-Sensitivity

Finally, with all this background in place, we can return to question-sensitivity. We will apply our semantics to see if we can explain the features of question-sensitivity we uncovered above. Association with focus will be a key component, but only a part of the story.

Recall, we had two features to derive for question-sensitivity:

1.  $BAE^+Q^+$  what: False.
2. The flip.
  - $BAE^-Q^-$  who: False.

- $BAE^+Q^+$  who: True

We can now see if and how these results come out of our semantics, by doing a few computations.

Here are the components of our computations. First, recall that our semantics tells us that *know* is true iff  $\max_{E(x,w)}(f(x,w)) \subseteq P$ . We will fix a few features for the target question-sensitivity cases. We will fix that Ann (=  $a$ ) is the speaker and the agent of the attitude, and that we are in the world described by  $FA$ . Hence, we will usually not mention our world and agent parameters ' $x$ ' and ' $w$ '. Also, assume from  $BA$  that the presuppositions on  $f$  and  $P$  are satisfied.

We already know that  $f(x,w)$  is context-dependent, and that association with focus will have it fixed to be  $\cup C$  for a salient  $C$  provided by the QUD. (Technically, it is only constrained by  $\cup C$ , but as I noted above, we usually pragmatically strengthen this effect to have  $f(x,w) = \cup C$ .) This allows us to assume that *know* is true iff  $\max_E(\cup C) \subseteq P$ . It will simplify matters to assume that  $E$  is coherent, so that  $\cap E$  is non-empty. It will also simplify matters to assume that not all members of  $\cup C$  are ruled out by the total available evidence. This is satisfied if  $DOX$  and  $E$  are veridical. If it fails, all worlds believed or considered are ruled out, which is degenerate case we can safely ignore.

Putting all these together, we get:

- $\max_E(\cup C) = (\cup C) \cap (\cap E)$ .
- *know* is true iff  $((\cup C) \cap (\cap E)) \subseteq P$ .
- $P = \llbracket \text{Claire stole the diamonds} \rrbracket$ .
- So *Ann knows that Claire stole the diamonds* is true iff every alternative world compatible with all the evidence is a world where Claire stole the diamonds.

We can now compute truth values in our contexts.

Let us start with the weak  $BAE^-Q^-$  who context. In this, we have  $C = \text{QUD} = \{\llbracket x \text{ stole the diamonds} \rrbracket : x = \text{Claire, Ann, Ben, } \emptyset, \dots\}$ . As this is a  $Q^-$  context, we include  $\emptyset$  (i.e. no one stole the diamonds). The  $BAE^-Q^-$  who computation is then:

- Is every world in  $\cup C$  compatible with the total evidence  $\cap E$  one where Claire stole the diamonds?
- No. The total evidence, i.e. fingerprints, does not rule out the null option, that no one stole the diamonds and Claire took out some rubies to display.
- So, predict **False**.
- This is the correct result.

Now for the strong  $BAE^+Q^+$  who context. Here  $C = QUD = \{[x \text{ stole the diamonds}]: x = \text{Claire, Ann, Ben, ...}\}$ , but as we have a  $Q^+$  context, we do not include  $\emptyset$ . The  $BAE^+Q^+$  who computation is then:

- Is every world in  $\cup C$  compatible with the total evidence  $\cap E$  one where Claire stole the diamonds?
- $C$  no longer includes the null option.
- So we conclude yes. We know someone stole the diamond, and our evidence is enough to rule out anyone other than Claire.
- So, predict **True**.
- This is the correct result.

Thus, we get the flip.

Now we can do our *what*-context. In the strong  $BAE^+Q^+$  what context, we have  $C = QUD = \{[Claire \text{ stole } x]: x = \text{the diamonds, the rubies, the trade secrets, ...}\}$ . As this is a  $Q^+$  context, we do not include  $\emptyset$ . The  $BAE^+Q^+$  what computation is then:

- Is every world in  $\cup C$  compatible with the total evidence  $\cap E$  one where Claire stole the diamonds?
- We conclude no. The evidence of fingerprints on the safe tells us nothing to rule out any option in  $C$ .
- So, predict **False**.
- This is the correct result.

So, we have generated all the right results for question-sensitivity.

We thus have an account of the semantics and pragmatics of knowledge ascriptions that gets the right results on the question-sensitivity cases. But what really made that happen? We have seen the computations in detail, but should ask what is important in them, and what carries the explanatory weight.

First, though, we should observe again that our semantics for *know* is context-dependent. It is a very standard semantics for attitudes, that has a standard form of context-dependence, derived from the parameter  $f(x, w)$ . It shows strong association with focus effects (specifically, in the terminology of Beaver & Clark (2008), free association with focus). Again, that is entirely standard for this sort of case. Because of this, I agree with Schaffer and Szabó that in spite of resistance to other forms of contextualism for knowledge, this form is well-motivated and well-supported. A fully standard semantics and pragmatics predicts contextualism. Thus, to an extent, we have vindicated contextualism.

The main place where we see the role of context-dependence is in comparing our strong *who* and *what*-contexts. There, context hands us entirely different domains:



$\{\{x \text{ stole the diamonds}\}\}$  versus  $\{\{\text{Claire stole } x\}\}$ . It is then easy to see that  $E$  does not help rule out any *what*-worlds.

But, when we look more closely at the flip, we see something more complicated. It may be tempting view of the flip as also a matter of context-dependence. After all, context does provides different domains. In the weak case,  $C$  includes  $\emptyset$ . In the strong case, it does not. The evidence is not sufficient to rule out  $\emptyset$ -worlds. So, we have different truth values, as a result of context-dependence.

But, I think here we can see the importance of non-contextual factors as well. Our formal apparatus supposes a set of evidence propositions  $E$ , and computes  $(\cup C) \cap (\cap E)$ . This is important, as it helps characterize what we need to check to determine truth values. It tells us we need to rule out worlds in  $\cup C$  according to the evidence. But our descriptions of the contexts, and our attempt to enumerate the facts as  $FA$ , do not directly provide us with  $E$ . Rather, we try to work out what worlds in  $\cup C$  would be ruled out, according to our understanding of the information we have about the evidence. The main piece of evidence, as we make clear in  $FA$ , is fingerprints. But, we need to also combine that with whatever else we know in the context to work out truth values. We did this above by considering, informally, which of the various propositions specified in  $C$  would be affected by the presence of fingerprints. But that always goes along with some inferences that make use of other factors.

With this in mind, let us look at our *who*-contexts again. Semantically, the difference between the strong and weak *who*-contexts is just one of whether  $\emptyset$  is among the options we have to rule out with  $E$ . That was important to how we explained the flip. But let us look again at how a normal option is ruled out, say the one where someone else, Fred, stole the diamonds. Our evidence is Claire's fingerprints, and it is not so simple how that might tell us anything about whether Fred stole the diamonds. In the weak,  $BAE^-Q^-$ -who context, it does not have to. We will not rule out  $\emptyset$ , so it will not change our truth value whether or not we rule out Fred stealing the diamonds.

In the strong context  $BAE^+Q^+$ -who, to get the truth value of True, we do have to rule out every option except Claire stealing the diamonds. So we have to rule out the case of Fred stealing the diamonds. But notice, formally, the situation is no different. We are asking if the Fred world is in  $\cap E$ . We are going beyond our formal description in reaching the value True for the strong *who*-context.

The key, I believe, is that we also have an epistemically strong context: one where we know that someone stole the diamonds. This is more than just not having  $\emptyset$  in  $\cup C$ . It affects how we assess the evidence of fingerprints.

Our judgment in the strong context reflect ruling out the Fred world. But how do we do it? Does the evidence of Claire's fingerprints tell us anything about this world? Not directly. It tells us nothing about Fred. But in the strong context, we know that someone stole the diamonds. That appears to affect what our evidence can rule out: in the presence of that knowledge, our evidence does seem to rule out Fred stealing them. The presence of Claire's fingerprints (and only Claire's) make her the only suspect. Someone stole the diamonds, so if Claire is the only suspect, it must have been her. So we rule out the Fred world.

This is a just-so story, and like all just-so stories, this one is pretty sketchy, and I am not sure about the details. (And, if you stare at it, you might start doubting your own judgments on the main case, maybe in stakes-like fashion.) But nonetheless, it indicates that something other than just context-dependence is at work. What we assume about the situation affects not just context-dependent semantic values, but how evidence works, and what evidence can tell us. That is not context-dependence, according to the semantics and pragmatics we just developed.

In contrast, in the weak  $BAE^-Q^-$  who context, in addition to not being able to rule out  $\emptyset$ , it seems we cannot rule out the Fred world. If we do not know that someone stole the diamonds, it is hard to see how we can tell any story that makes a connection between the evidence of Claire's fingerprints and Fred's activity. Even if the just-so story is just-so, the contrast seems fairly clear. And it is about evidence, not context-dependent domains.

We thus see that to get the flip, we need not only the domain  $C$  the context provides, but also background knowledge that affects how our evidence rules out alternatives. The latter is not an aspect of context-dependence, either according to our semantics or intuitions. Both are needed to generate the flip.<sup>12</sup>

So what is the role of context in question-sensitivity? It appears to be relatively weak. It helps to fix alternatives to rule out, but does not specify anything about how they are ruled out. This does play a genuine role. Just setting up the domains of alternatives is sufficient for explaining the *what*-cases. In either the strong or weak *what*-context, our alternatives to rule out, provided by context, are things like Claire stole the rubies, Claire stole the pencils, and so on. Evidence of Claire's fingerprints on the safe tells us nothing about those, so it is easy to see that we get truth values of False in both of those cases. But to explain the flip, we need more. And without the flip, we do not get the truth value variation. So, context is not the whole story.

Actually, this suggests there might be an alternative explanation of question-sensitivity. Recall, we assumed that  $FA$  is sufficient to determine truth values. One way of seeing the just-so stories is that they effectively weaken this assumption. They do so in two ways. One is that they reveal ways that  $FA$  may be incomplete, and how we complete it might be influenced by other factors that we tried to put into context. We see that we strengthened  $FA$  in our reasoning, to include no one else stealing anything, making Claire the only suspect in one case. We may have also smuggled in an assumption that nothing else was stolen. This shows that  $FA$ , though a fairly good transcription of what we explicitly supposed the facts to be, may not be all there is to the facts we work with when reasoning about evidence.

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<sup>12</sup> Incidentally, **If** you got ok judgments on the intermediate  $BAE^-Q^+$  who context, then this likely explains them. In this case,  $C$  does not contain  $\emptyset$ . But the judgement is false. Presumably because the evidence does not rule out the Fred case, so lack of  $\emptyset$  is not sufficient.

There is another way our assumption that *FA* is sufficient to determine truth values might be weakened, that I think is more important. In addition to the extra facts to which we might have implicitly appealed, listed a moment ago, facts about what else is known are involved in determining truth values. We have seen that this is crucial for the flip. Together, these two observations invite the idea that we could put all the important effects of question-sensitivity into the truth supporting circumstances. Can we then skip context-dependence altogether?

The proposal here would be that instead of context-dependence, we see different truth-supporting circumstances at work in the main question-sensitivity cases. Focusing on the strong cases, and ignoring the flip, we would have at least two different truth-supporting circumstances:

- (46) a. *FAE*<sup>+</sup>who: *FA* + known that someone stole the diamonds (plus more).  
b. *FAE*<sup>+</sup>what: *FA* + known that Claire stole something (plus more).

Can this explain everything, without appeal to context-dependence?

I think the answer is no, for several reasons (though the most committed invariantists in epistemology will disagree). First, the work of the previous sections shows that we really do have context-dependence. We have it on good linguistic grounds. The context-dependence involved is exactly the same as other well-documented sorts. It offers a standard explanation of how questions affect truth values. So, we can use it without reservations. It is there, and we should not ignore it.

And we do make substantial, if partial, use of the effects of context. They guarantee that the domains of alternatives for the evidence to rule out differ in important ways. This is crucial for getting the behavior of the *what*-case.

Can we explain this without appeal to context? We might imagine that roughly, in a given circumstance, you generate a range of options based on what you know, and see how evidence rules them out? But context-dependence explains and clarifies this much more successfully. It allows a kind of contextual pre-structuring of domains. That tells us what goes into the domains, using independently supported linguistic principles. We then easily get the right explanation in the *what*-case. The context-based approach offers a clear explanation, at no additional cost.

So, we have established three things. First, there is context-dependence in the attitude verb *know*. Second, this is important to explaining the phenomenon of question-sensitivity. But third, it is only part of the explanation. Non-contextual factors, about how evidence works, are also crucial to the full explanation.

This vindicates contextualism. To a point. *know* is context-dependent, and that context-dependence matters. But, given its limited role, we should ask how important the context-dependence is to our understanding of the semantics of *know*, or to our understanding of knowledge itself. That is our last task, to which we now turn.

## 6 Varieties of Context-Dependence

One striking feature of the linguistic facts pertaining to the context-dependence of *know* is how general they are. We have an operator that universally quantifies over a context-dependent domain. The domain is partly set by lexical factors, but partly by context. This situation appears across attitudes (as we saw), but also adverbials, D-quantifiers, and so on. It is widespread. In such cases, association with focus plays a significant role in setting the domain in context. This effect of association with focus is also very widespread, and may well be an entirely general feature of this sort of environment (cf. Beaver & Clark 2008). What appears to be a specific feature of the verb *know* providing question-sensitivity turns out to be the result of several highly general linguistic mechanisms.

Of course, these general mechanisms have specific effects in the setting of knowledge ascriptions. This is most clear in the *what*-case  $BAE^+Q^+$  *what*. There, context sets up a range of alternatives, for which it is clear that the available evidence fails to rule out any of them. It is much less clear in the *who*-cases and the flip. The key factor in getting the flip was ruling out alternatives. Context still sets up a range of alternatives, but why they are ruled out has more to do with inferences from evidence than with the effects of context.

So, a very general effect of context-dependence sets up one easy case, but that does not appear to be all of the underlying phenomenon. It appears to be a somewhat superficial effect. Input from context makes certain cases clear and easy. Without it, it is not clear if we could get the right results. But it does not explain all that goes into our judgments, and it is not clear if it is doing much in the most difficult aspects of the phenomenon in question.

I think this is a reflection of the very general nature of the context-dependence involved. In many cases where we discover context-dependence, we at the same time discover something important about the meaning of a particular expression (or a highly specific class of expressions), and presumably thereby discover something important about the underlying property that term expresses (or class of properties). For instance, suppose you happened not to notice that gradable adjectives like *rich* are context-dependent. You could discover that it is context-dependent, and develop a semantics based on, for instance, comparison classes or standards for richness. These are context-dependent parameters that feed the meaning of *rich*. And, along with that, you might conclude that the property of being rich reflects this. Thus, it is (in a special way) *relational*. To be rich, our semantics informs us, is to be rich compared to some group of people or some standard amount of money. In cases like this, we learn something specific and important about the word *rich*, and about the property it expresses (and likewise for the whole category of gradable adjectives).

Many instances of context-dependence are like this. They are deep results about both specific words or classes of words, and the properties they express. The context-dependence we have been working with here is different. It is a general effect of domain restriction and association with focus for operators. As we saw a moment ago, it occurs very widely, across a wide range of types of expressions. This is incredibly important linguistically, and provides a substantial generalization about how context-dependence works in language. It is a collection of deep results about some basic mechanisms our

languages use. But unlike the case of *rich* we just looked at, it uncovers no special features of the specific properties specific words or classes of words express.

Let us see how this plays out for *know*. We have an analysis of *know*—one among many kinds of universal quantifiers in language. This gives it a domain of quantification, which like almost all such domains shows some context-dependence, and in particular, association with focus. No special feature of the underlying property of knowledge is identified by noting it is context-dependent (beyond its being a universal quantifier over a partly context-dependent domain). The fact that it is context-dependent can set up some easy truth value judgments. But, it does not suffice for any judgment which requires subtle understanding of how this particular property works.

Call this sort of context-dependence *general*. It is context-dependence of how broad genera of linguistic expressions, such as operators, interact with other highly general mechanisms such as association with focus, question-answer congruence, and so on. We have concluded that the context-dependence of *know* is general. In contrast, substantial lexical context-dependence, of the kind we illustrated with *rich*, is of course specific to that lexical item or a specific class of items. Thus, it is an example of the contrasting sort of *specific* context-dependence.

General context-dependence is linguistically very important, and it has been well-documented. But it is different from what we typically think of as ‘contextualism’ in philosophy. That tends to be a matter of specific context-dependence, often of a contentious sort.

We can see this in the case of knowledge ascriptions. Has the discussion here vindicated contextualism about knowledge ascriptions? In a sense, of course, yes. I have argued, following others, that *know* is in fact context-dependent. So contextualism is to an extent vindicated. But the form of context-dependence is general. This still matters, as it is an important part of our explanation of the phenomenon of question-sensitivity. But as I argued, the effects of general context-dependence are only part of the explanation of question-sensitivity. They take care of the easy part, about structuring domains of alternatives. The hard part is deciding what makes evidence rule out what, and that is not a matter of context-dependence. Rather, it is a matter of how background knowledge affects evidence.

So, we have contextualism about knowledge ascriptions, but of a limited sort. I close by speculating that for philosophical purposes, general context-dependence, like we see with *know*, is really very weak. It shows how the background structure of language can affect uses of expressions in context. But we have not seen reason to think the fundamental features of knowledge ascriptions make use of this in any special way, and we have certainly not seen why we might conclude something basic about the *property* of knowledge. So, it seems we may have a very weak form of contextualism, which may interest the linguist, but it does not resolve many important questions in epistemology.

We thus have two kinds of context-dependence. One is general, and has sources in general mechanisms crossing wide ranges of expressions and other apparatus encoded in language. Precisely because of its generality, it is of great interests to those of us studying language,

to whom generalizations are of great value. It has many sources. We have seen features of operators, focus, and question-answer congruences can be sources. This is almost certainly not an exhaustive list. The other kind of context-dependence is specific, resulting from the features of specific lexical items or classes of items. This is, of course, also of linguistic interest. It may not provide such sweeping generalizations, but it can provide deep insights into lexical meaning. When it comes to learning about concepts expressed by words, it appears that it is specific, and not general context-dependence that we need. To support what philosophers call contextualism, we seem to need specific context-dependence.

## References

- Asher, N. (1987). 'A typology for attitude verbs and their anaphoric properties', *Linguistics and Philosophy*, 10: 125–97.
- Beaver, D. I., & Clark, B. Z. (2008). *Sense and Sensitivity: How Focus Determines Meaning*. West Sussex: Wiley-Blackwell.
- Beaver, D. I., Clark, B. Z., Flemming, E., Jaeger, T. F., & Wolters, M. (2007). 'When semantics meets phonetics: Acoustical studies of second-occurrence focus', *Language*, 83: 245–76.
- Berman, S. (1987). 'Situation-based semantics for adverbs of quantification', *University of Massachusetts Occasional Papers in Linguistics*.
- Büring, D. (2003). 'On D-trees, beans, and B-accent', *Linguistics and Philosophy*, 26: 511–45.
- . (2016a). '(Contrastive) topic'. In Féry C. & Ishihara S. (eds.) *Oxford Handbook of Information Structure*, pp. 64–85. Oxford: Oxford University Press.
- . (2016b). *Intonation and Meaning*. Oxford: Oxford University Press.
- Cohen, S. (1999). 'Contextualism, skepticism, and the structure of reasons', *Philosophical Perspectives*, 13: 57–89.
- DeRose, K. (1992). 'Contextualism and knowledge attributions', *Philosophy and Phenomenological Research*, 52: 913–29.
- Dretske, F. (1972). 'Contrastive statements', *Philosophical Review*, 81: 411–37.
- . (1981). 'The pragmatic dimension of knowledge', *Philosophical Studies*, 40: 363–78.
- von Stechow, P. (1994). *Restrictions on Quantifier Domains*. Ph.D. dissertation, University of Massachusetts at Amherst.
- . (1999). 'NPI licensing, Strawson entailment, and context dependency', *Journal of Semantics*, 16: 97–148.
- Goldman, A. (1976). 'Discrimination and perceptual knowledge', *Journal of Philosophy*, 73: 771–91.

- Groenendijk, J., & Stokhof, M. (1984). *Studies in the Semantics of Questions and the Pragmatics of Answers*. Ph.D. dissertation, University of Amsterdam.
- Hamblin, C. L. (1973). 'Questions in Montague English', *Foundations of Language*, 10: 41–53.
- Hawthorne, J. (2004). *Knowledge and Lotteries*. Oxford: Oxford University Press.
- Heim, I. (1992). 'Presupposition projection and the semantics of attitude verbs', *Journal of Semantics*, 9: 183–221.
- Herburger, E. (2000). *What Counts: Focus and Quantification*. Cambridge: MIT Press.
- Heycock, C., & Kroch, A. (2002). 'Topic, focus, and syntactic representation', *Proceedings of the West Coast Conference on Formal Linguistics*, 21: 141–65.
- Hintikka, J. (1969). 'Semantics for propositional attitudes'. In Davis J. W., Hockney D. J., & Wilson W. K. (eds.) *Philosophical Logic*, pp. 21–45. Dordrecht: Reidel.
- Hooper, J. B. (1975). 'On assertive predicates'. In Kimball J. P. (ed.) *Syntax and semantics*, Syntax and semantics, Vol. 4, pp. 91–124. New York: Academic Press.
- Horn, L. R. (1972). 'A presuppositional analysis of *only* and *even*', *Papers from the Chicago Linguistics Society*, 5: 97–108.
- Jackendoff, R. S. (1972). *Semantic Interpretation in Generative Grammar*. Cambridge: MIT Press.
- Kadmon, N. (2001). *Formal Pragmatics*. Oxford: Blackwell.
- Kadmon, N., & Landman, F. (1993). 'Any', *Linguistics and Philosophy*, 16: 353–422.
- Karttunen, L., & Peters, S. (1979). 'Conventional implicature'. In Oh C.-K. & Dinneen D. A. (eds.) *Presupposition*, Syntax and semantics, Vol. 11, pp. 1–56. New York: Academic Press.
- Kratzer, A. (1977). 'What *must* and *can* must and can mean', *Linguistics and Philosophy*, 1: 337–56.
- . (1989). 'An investigation into the lumps of thought', *Linguistics and Philosophy*, 12: 607–53.
- Ladd, D. R. (1996). *Intonational Phonology*. Cambridge: Cambridge University Press.
- Lewis, D. (1973). *Counterfactuals*. Cambridge: Harvard University Press.
- . (1996). 'Elusive knowledge', *Australasian Journal of Philosophy*, 74: 549–67. Reprinted in Lewis (1999).
- . (1999). *Papers in Metaphysics and Epistemology*. Cambridge: Cambridge University Press.

- Merchant, J. (2001). *The syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.
- Partee, B. H. (1991). 'Topic, focus and quantification', *Proceedings of Semantics and Linguistic Theory*, 1: 159–87.
- Pierrehumbert, J., & Hirschberg, J. (1990). 'The meaning of intonational contours in the interpretation of discourse'. In Cohen P. R., Morgan J., & Pollack M. E. (eds.) *Intentions in Communication*, pp. 271–311. Cambridge: MIT Press.
- Portner, P. (2009). *Modality*. Oxford: Oxford University Press.
- Reed, B. (2010). 'A defense of stable invariantism', *Nous*, 44: 224–44.
- Roberts, C. (1996). 'Information structure in discourse: Towards an integrated formal theory of pragmatics', *Ohio State University Working Papers in Linguistics*, 49: 91–136.
- . (2011). 'Topics'. In Maienborn C., Heusinger K. von, & Portner P. (eds.) *Semantics: An International Handbook of Natural Language Meaning*, Vol. 2, pp. 1908–33. Berlin: de Gruyter Mouton.
- Rooryck, J. (2001a). 'Evidentiality, Part I', *GLOT International*, 5: 125–33.
- . (2001b). 'Evidentiality, Part II', *GLOT International*, 5: 161–8.
- Rooth, M. (1985). *Association with Focus*. Ph.D. dissertation, University of Massachusetts at Amherst.
- . (1992). 'A theory of focus interpretation', *Natural Language Semantics*, 1: 75–116.
- . (1999). 'Association with focus or association with presupposition?' In Bosch P. & Sandt R. van der (eds.) *Focus: Linguistic, Cognitive, and Computational Perspectives*, pp. 232–44. Cambridge: Cambridge University Press.
- Schaffer, J. (2004). 'From contextualism to contrastivism', *Philosophical Studies*, 119: 73–103.
- . (2005). 'Contrastive knowledge', *Oxford Studies in Epistemology*, 1: 235–71.
- . (2007). 'Knowing the answer', *Philosophy and Phenomenological Research*, 75: 383–403.
- Schaffer, J., & Knobe, J. (2012). 'Contrastive knowledge surveyed', *Nous*, 46: 675–708.
- Schaffer, J., & Szabó, Z. G. (2014). 'Epistemic comparativism: A contextualist semantics for knowledge ascriptions', *Philosophical Studies*, 168: 491–543.
- Schwarzschild, R. (1999). 'Givenness, avoidF and other constraints on the placement of accent', *Natural Language Semantics*, 7: 141–77.



Selkirk, E. (1995). 'Sentence prosody: Intonation, stress, and phrasing'. In Goldsmith J. A. (ed.) *Handbook of Phonological Theory*, pp. 550–69. Oxford: Blackwell.

Simons, M. (2007). 'Observations on embedding verbs, evidentiality, and presupposition', *Lingua*, 117: 1034–56.

Stalnaker, R. (1984). *Inquiry*. Cambridge: MIT Press.

Stanley, J. (2005). *Knowledge and practical interests*. Oxford: Oxford University Press.

Stine, G. (1976). 'Skepticism, relevant alternatives, and deductive closure', *Philosophical Studies*, 29: 249–61.