Stating the obvious: *Of course* as a focus-sensitive marker of uncontroversiality[1]

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Abstract. The English discourse particle *of course*, part of a cross-linguistic class of elements that express the 'uncontroversiality' of a proposition, has received little attention from theoretical linguists. Studies in the domain of uncontroversiality, particularly of the German particles *doch* and *ja*, typically treat uncontroversiality as a property that holds of a proposition for all participants in a discourse. We first show that *of course* cannot be folded into prior treatments of *doch* and *ja*. Furthermore, we argue that *of course* motivates a finer-grained notion of uncontroversiality that is focus-sensitive and relativized to individual discourse participants. While our analysis in principle allows for relativizing uncontroversiality to multiple discourse participants, we argue that *of course* is semantically relativized only to the speaker. Rather than being lexically specified, we argue that the apparent addressee-oriented uncontroversiality conveyed by *of course* follows from general pragmatic reasoning about shared knowledge in a discourse.

Keywords: discourse particle, polarity, uncontroversiality, pragmatics.

1. Introduction

The semantic and pragmatic contributions of the English discourse particle *of course* have been underexplored in the theoretical linguistics literature (though see Holmes 1988 for a functionalist view). A canonical example of *of course* in discourse is given in (1).[2]

(1)   A: Did Maude make her famous kumquat strudel for the potluck?
        B: **Of course** she did(n't).

B in (1) both provides an answer to A's question and, informally, conveys that the answer is or should be obvious to A, i.e., that the answer is *uncontroversial*.

Particles that have been argued to communicate uncontroversiality are found cross-linguistically in, e.g., German *doch* and *ja* (Grosz, 2010; Kaufmann and Kaufmann, 2012; Kraus, 2018: a.o.), St'át'imcets *qa7* (Kratzer and Matthewson, 2009), Finnish/Estonian *kyllä/küll* (Keevallik and Hakulinen, 2018), and Tagalog *naman* (AnderBois, 2016). The proliferation of such lexical items suggests uncontroversiality-marking to be a widely attested property of natural languages. This in turn raises the question of whether expressions of uncontroversiality have a unified semantics and pragmatics, or whether there is cross-linguistic variation.

In this paper, we contribute to the typological study of uncontroversiality by looking at *of course*. We argue that *of course* is a not-at-issue, focus-sensitive discourse particle that marks

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[2]*Of course* may also be used as a response particle on its own or with *not*:

(i)   A: Did Maude make her famous kumquat strudel for the potluck?
        B: **Of course** (not).

While we believe that *of course* in these uses contributes a similar semantic and pragmatic meaning, we set them aside here. See Kroll and Roberts (2019) for an analysis that derives these responses via ellipsis.

a proposition as more likely than its focus alternatives for the speaker. We also show that the apparent addressee uncontroversiality associated with *of course* arises from general pragmatic principles involving assumptions of shared beliefs and reasoning, rather than being part of its lexical semantics. Last, we show that while *of course* demonstrates similarities to the German modal particles *doch* and *ja*, its behavior is distinct from that of the German particles and therefore cannot be fully captured under existing analyses. We believe that this cross-linguistic variation in behavior suggests that uncontroversiality is an interesting locus of cross-linguistic variation.

The paper proceeds as follows. In §2, we provide an overview of the contexts in which *of course* is and is not felicitous. Section 3 compares *of course* with the well-studied German modal particles *doch* and *ja*. In §4, we present an analysis in which *of course* presupposes that a proposition is uncontroversial for the speaker and generates a pragmatic inference that the proposition is uncontroversial for the addressee. We additionally show how this analysis accounts for the distribution observed in §2. Section 5 discusses some additional open questions, and §6 concludes.

2. Empirical Ground

This section lays out the empirical ground of *of course*. We first show that *of course* is a positionally-variable, not-at-issue particle that appears in assertive responses to questions and to declaratives. We then show that *of course* communicates the uncontroversiality of a proposition for the speaker of the utterance, but not necessarily for the addressee(s) of the utterance.

2.1. Compatible sentence types

Of course is felicitous only in declarative sentences like (2). It is not compatible with imperatives (3), questions (4), or exclamatives (5).[3]

(2)   a.   Fran cleaned her room of course.
       b.   Of course Fran cleaned her room.

(3)   a.   *Of course clean your room!
       b.   *Clean your room of course![4]

(4)   a.   *Did you of course clean your room?
       b.   *Did you clean your room of course?

(5)   a.   *Of course what a clean room you have!
       b.   *What a clean room you have of course!

We account for this pattern by proposing that *of course* requires a propositional argument (see §4).

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[3]*Of course* can also be prosodically separated from its containing sentence by 'comma intonation' (Potts, 2005a). For simplicity, we restrict our focus here to uses of *of course* in which it is prosodically integrated, i.e., cases in which there is no such intonational separation, though we acknowledge that a full empirical account would need to grapple with the subtle and interesting issues raised by prosodic breaks.

[4]Note that an exchange like: *What should I do? Clean your room of course!* is not clearly an imperative, as opposed to an elliptical response derived from a non-imperative construction.

2.2. Distribution in discourse

Of course generally requires prior discourse context to be felicitous. It can be used in responses to questions and to assertions; crucially, however, the position in which it occurs is sensitive to the form of the preceding discourse move.

2.2.1. Responses to questions and assertions

Of course occurs naturally in responses to various discourse moves. For instance, *of course p* is felicitously used in responses to assertions. It can be used in an utterance that either confirms the preceding assertion or disagrees with it, although the disagreeing utterance can in certain contexts be construed as rude or aggressive.

(6)   A: Maude made her famous strudel for the potluck.
        B: Of course she did(?n't).

Of course can also be used in responses to polar questions, and can be used in a response of positive or negative polarity.

(7)   A: Did Maude make her famous strudel for the potluck?
        B: Of course she did(n't).

It can also be used in responses to wh-questions:

(8)   A: What did Maude make for the potluck?
        B: Her famous strudel of course!

Impressionistically, *of course* across all of these examples emphasizes the answer/response by indicating that the information is somehow **obvious** or **uncontroversial** to all conversational participants.

Notably, however, *of course* can be used in certain non-canonical discourses to emphasize this obviousness to the speaker in particular. For example, *of course* is quite natural when the speaker has a sudden realization, as in (9), and in responses to so-called *quiz questions*, in which the asker is interpreted not as genuinely seeking information but rather testing the knowledge of the askee, as in (10):

(9)   *Speaker is struggling to solve a math problem on the blackboard, then realizes which formula she needs to quickly find the answer.*
        The answer is 7 of course!

(10)   Game show host: What is the capital of Estonia?
        Contestant: Tallinn of course.

2.2.2. Positional variability

Of course is also variable in terms of its syntactic position. It sometimes prefers to sit sentence-finally, and sometimes prefers to sit sentence-initially.[5] However, there are constraints on when *of course* can appear in each position. In responses to polar questions and declaratives, *of course* generally prefers to sit sentence-initially:

(11)   A: Did Maude make her famous strudel for the potluck?
         B: Of course she did.
         B': ?She did of course.

(12)   A: Maude made her famous strudel for the potluck.
         B: Of course she did.
         B': #/??She did of course.

But in responses to wh-questions, it generally prefers to sit sentence-finally.

Wh-questions:

(13)   A: What did Maude make for the potluck?
         B: #Of course her famous strudel!
         B': Her famous strudel of course!

We return to this asymmetry below in §5.

2.3. (Not-)At-Issueness

We argue that *of course* is a not-at-issue discourse particle (Potts 2005b; Simons et al. 2010; Murray 2010; Rett 2018; a.m.o.). Not-at-issue content generally is not embeddable, projects past negation and propositional attitude verbs, and cannot be easily targeted by direct rejection. *Of course* must modify a matrix clause and cannot be embedded under a non-quotative reading, as demonstrated below.

(14)   A: Will Maude make her famous strudel for the potluck?
         B: #Elaine thinks that of course she will.

Of course is also speaker oriented and projects past propositional attitude verbs, as in (15).

(15)   A: Will Maude make her famous strudel for the potluck?
         B: Elaine thinks that she will of course.
              Possible interpretation: Of course Elaine thinks that Maude will.
              Impossible interpretation: #Of course Maude will, thinks Elaine.

Last, the content contributed by *of course* cannot easily be rejected directly.

(16)   Q: Will Maude make her famous strudel for the potluck?
         A: Of course Maude will make her famous strudel for the potluck.

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[5]It can also sometimes sit sentence-medially, but we focus here on its use in initial and final positions. When sentence-medial, it generally sits between larger constituents. Further exploration is needed to determine whether it is merged in this internal position or undergoes movement.

B: No! She will make an apple pie.
B': #No! It can't be obvious to you that she will make a strudel.[6]

2.4. Focus Sensitivity

Of course also associates with focus, which becomes clear upon examining its interpretation in responses to *wh*-questions. It has long been observed that in responses to constituent questions, focus falls on the constituent that corresponds to the *wh*-word in the interrogative form (Halliday, 1967; Rooth, 1992; Roberts, 1996). This pattern is called *Question-Answer Focus Congruence*. For example, in (17), focus only felicitously falls on the subject.

(17)   Q: Who plays the bassoon?
        A: ELAINE$_F$ plays the bassoon.
        A': #Elaine plays the BASSOON$_F$.

This pattern influences the focus alternatives in responses with *of course*. When *of course* is used in a response to a question or assertion, the relevant comparison set – the set of propositions that *p* is 'uncontroversial' compared to – is determined by which constituent receives focus.[7] For example, focus (realized by focal pitch accent) on different constituents in (18) changes the focus alternatives (in the sense of Rooth 1992) to which *p* is compared:

(18)   a.   Who plays the bassoon?
              [ELAINE]$_F$ plays the bassoon of course. (As opposed to John, Mary,...)
        b.   What does Elaine do with her bassoon?
              Elaine [PLAYS]$_F$ her bassoon of course. (As opposed to waxes, eats,...)
        c.   What instrument does Elaine play?
              Elaine plays the [BASSOON]$_F$ of course. (As opposed to the theremin, the zither,...)

We derive focus alternatives formally below, following Rooth (1985, 1992):

(19) $[\![[\text{Elaine}]_F \text{ play the bassoon}]\!]^f = \{x \textbf{ plays b} \mid x \in E\}$.[8]

The interpretation of (19) is that it is obvious or uncontroversial that Elaine plays the bassoon, as opposed to any other individual in some contextually determined set.

Focus alternatives are derived similarly when focus falls on an object, as in (20).

(20)   *Three of our friends are trying out for an orchestra. I know they all play different instruments, but I don't know who plays what. I can ask:*
        A: Which instrument does Elaine play?
        B: Elaine plays the [BASSOON]$_F$ of course.

We predict that *of course* is marking the proposition {*w*: Elaine plays the bassoon in *w*} as uncontroversial compared to the propositions created by the focus alternatives of (20), given

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[6]A wrinkle: *Of course* can be used to respond to a Question under Discussion (QUD) (Roberts, 1996; Ginzburg, 1996), especially in its bare response use, in which it behaves similarly to a polarity particle. Please see Kroll and Roberts (2019) for additional discussion.

[7]We tentatively propose that *of course* falls under Beaver and Clark's (2008) *free association* with focus, though additional work remains to be done on this question.

[8]Contextual domain restriction assumed.

below in (21):

(21) $[\![$Elaine play the [bassoon]$_F$$]\!]^f$ = {**e plays** x |x ∈ E}.

The interpretation of (20) is that it is obvious or uncontroversial that Elaine plays the bassoon, as opposed to any other instrument in some contextually determined set.

In the previous examples, it is clear from Question-Answer Focus Congruence where focus will fall in responses to the questions. In responses to polar questions or declaratives, the placement of focus is less immediately apparent. We propose that in responses to polar questions and declaratives, focus is realized as verum or polarity focus with a focal pitch accent on *of course* itself (Höhle, 1992). For example, in (22), realizing focus as verum or polarity focus yields the alternative propositions {*w*: Elaine plays the bassoon in *w*} and {*w*: Elaine does not play the bassoon in *w*}.

(22)   Does Elaine play the bassoon?
        [OF COURSE]$_F$ Elaine plays the bassoon.

The response in (22) indicates the obviousness of Elaine's playing the bassoon as opposed to her not playing the bassoon.

2.5. Perspective

While it is clear at this point that *of course p* communicates that *p* is somehow obvious or uncontroversial, we have not yet specified for whom *p* must be obvious/uncontroversial. Is it the speaker, the addressee, or both? After all, what is obvious to one person need not be so to another.

The requirement on speaker-oriented uncontroversiality is apparent. First, it is infelicitous for a speaker to use *of course* to modify a proposition whose information is surprising or unexpected to them:

(23)   *Maude has always brought desserts and nothing else to potlucks: strudels, pies, what-*
        ever dessert you can think of, but never anything else. After a recent potluck, Beatrice
        is talking with Amy:
        A: Bummer I missed the last potluck, how was it?
        B: It was good. Maude brought a rack of lamb (#of course).

Additionally, it is infelicitous for a speaker to use *of course* to modify a proposition whose information they are unsure of:

(24)   *Amy and Beatrice are at a potluck. There are some cookies on the table and Amy is a*
        strict vegan.
        A: Are the cookies vegan?
        B: Of course they are! I made them with you in mind.
        B': ??/#Of course they are! John made them and he probably remembered that you're
        a vegan.

Based on the examples we have seen thus far, a natural hypothesis is that *p* must be obvious to both the speaker and the addressee; in fact, Holmes (1988) explicitly defines the meaning of

of course as providing "an overt signal that the speaker is assuming that the hearer accepts or is already familiar with the propositional content of her or his utterance" (pg. 53). However, while intuitive, we can see that this can't be quite correct. For instance, we have seen that *of course* is felicitous in responses to sincere information-seeking questions, such as (25), for which the response is not in the common ground. Making the case even more strongly, we have also seen that *of course* is felicitous in responses that contradict a preceding assertion, as in (26).

(25)   *Alphonse and Bartholomew are discussing politics. Alphonse doesn't follow the news.*
         A: Who won the election?
         B: Mary did of course.

(26)   A: John will never come to the party.
         B: Of course he will! He never misses a chance for free hors d'oeuvres.

In these examples, B seems to suggest that A *should have* known something—that Mary was the winner in (25) and that John will attend the party in (26)—but not that they **did** know. If *of course* presupposes that the addressee finds p uncontroversial, we incorrectly predict that B's responses in (25) and (26) would be infelicitous.

There are at least two additional uses in which information regarding p is not presupposed to be available to the addressee. In these cases, the speaker does not even clearly indicate that the addressee *should have* known something. We call these two uses the *confidential* and *concessive* uses, following Holmes (1988) and Quirk et al. (1972), respectively.

Confidential uses

Confidential uses are those in which the speaker signals shared attitudes or knowledge regarding p with the addressee even when the speaker is aware that no such shared knowledge exists. This is done as a way to signal camaraderie and in-group membership. A canonical context for the confidential use of *of course* is in a sequence of instructions, as in (27):

(27)   *Mary, teaching John to drive a manual:*
         You press the clutch to shift into first gear, and then *of course* you press the clutch again to brake to a stop.

Concessive uses

Another use of *of course* is the *concessive* use, in which the speaker signals she is about to proffer additional relevant information on a particular topic.

(28)   A: Who is trying out for the available orchestra seat?
         B: John is. Of course, so is Elaine.

Informally, in the concessive usage of *of course*, the proposition following *of course* is presented as being potentially relevant additional information for satisfying a particular conversational goal, such as addressing a QUD. In the case of (28), B begins to answer A's question by pointing out that John is trying out, but indicates that A should not assume that means he's a shoo-in for the spot by pointing out that, *of course*, Elaine is also a possibility. Crucially, B is by no means insinuating that A should have known or did know that Elaine was trying out for the orchestra, but merely that it is important information to keep in mind.

2.6. Interim Summary

We have so far presented evidence that *of course* is a focus-sensitive, positionally variable, not-at-issue response particle that marks a proposition *p* as uncontroversial/obvious for the speaker, but not necessarily for the addressee. In the next section, we show that the behavior of *of course* is distinct from the behavior of the German particles *doch* and *ja*.

3. Comparison to German modal particles *doch* and *ja*

While *of course* has received comparatively little attention by theoretical linguists, the superficially similar German discourse particles *doch* and *ja* are quite well-studied. Like *of course*, *doch* and *ja* have been argued to mark information as 'obvious' or 'uncontroversial' (Kratzer and Matthewson 2009; Grosz 2010; Zimmermann 2011; Kaufmann and Kaufmann 2012; Kraus 2018; a.o). This makes existing work on *doch* and *ja* a compelling starting point for an analysis of *of course*. However, we show that while *of course* expresses a similar meaning as the German particles, its use is distinct from *doch* and *ja* in several ways, and therefore cannot be straightforwardly folded into the analysis of one or the other.

3.1. *Doch*

Most accounts of *doch* argue that it introduces a Stalnakerian presupposition that its modified proposition is uncontroversial, and that, additionally, this uncontroversial proposition is somehow contradictory to previous information in the discourse. Authors vary in how exactly they cash out this presupposition of $doch(p)$.

For Grosz (2010), *p* is an 'established fact' and has a salient focus alternative *q* which contradicts *p*. For Kaufmann and Kaufmann (2012), the notion of uncontroversiality is inextricably tied to that of *normalcy*. What it means for a proposition to be uncontroversial in a particular situation *c* is that *normally*, any rational agent who wishes to find out whether *p* in a situation *c* is able to do so using information that is already known or in the immediate vicinity of the conversation. They additionally propose that *doch* presupposes that *c* is *not* normal in this way – in other words, any agent *should* be able to determine whether *p* in the discourse context, but they cannot, for whatever reason. Rojas-Esponda (2013), on the other hand, proposes that *doch p* presupposes that the current QUD was previously closed (either unanswered or shown invalid).

Whatever the details of a sufficient analysis of *doch*, it quickly becomes clear that an account of *doch* cannot be directly applied to *of course* for two reasons. First, *doch* can appear in imperatives, unlike *of course*:

(29)   a.   *Ruf   ihn **doch** an!*
                call.IMP him DOCH VPREF
                '(Just) call him!'   (Kaufmann & Kaufmann 2012: 214)
        b.   *Call him of course!

Second, and perhaps more critically, *doch* can be used in situations where reality contradicts the way the things 'normally' are; however, *of course* is felicitous only when the state of affairs is consistent with the speaker's expectations. Thus, the utterance in (30b) is infelicitous, because the neighbors' actions are inconsistent with the proposition expressed by *today is Sunday*:

(30)   Context: I wake up on a Sunday at 6AM because the neighbors are drilling.
     a.   *Heute ist **doch** Sonntag!*
        today is DOCH Sunday
        'But today is Sunday!'   (Grosz 2010: 4)
     b.   #Today is Sunday of course!

To summarize, while *doch* shares a core of 'uncontroversial' meaning with *of course*, it additionally conveys that the uncontroversial proposition is somehow contrary to expectations or established fact, whereas *of course* is incompatible with such situations.

3.2. *Ja*

Ja has also been argued to express a meaning of uncontroversiality overlapping with that of *doch*. Kaufmann and Kaufmann (2012) and Grosz (2010) both explicitly analyze the uncontroversial component of *ja*'s meaning as being identical to that of *doch*. For Grosz, this is the end of the story: *ja* is strictly weaker than *doch*. For Kaufmann & Kaufmann, *ja(p)* additionally presupposes that the conversational context is 'normal' in the sense delineated above – i.e., that anyone who wishes to find out whether *p* can do so from information readily available in the context.

On the other hand, Viesel (2015) and Kraus (2018), following earlier work, claim *ja* takes two propositional arguments – a proposition *p* which is uncontroversial, and the other representing a discourse move explained by *p*. In other words, *ja(p)* is used to point out that *p* is to be expected given some other body of evidence.

At first brush, this makes *ja* appear to be kith and kin with *of course*, as both mark a proposition as being uncontroversial or obvious. However, *ja* and *of course* differ in two important empirical ways. First, while *ja p* can be used whenever *p* is known to all discourse participants, regardless of where evidence for *p* came from, *of course p* is infelicitous if the speaker's only evidence for *p* is from the immediate context of the discourse.

(31)   The speaker sees the addressee for the first time in bright sunlight and realizes the
     addressee's eye color.
     a.   *Du hast **ja** grüne Augen!*
        you have JA green eyes
        'You have JA green eyes!'   (Grosz 2010: 7)
     b.   #Of course you have green eyes!/You have green eyes, of course!

An utterance of (31b) is only felicitous if the speaker has some reason to expect that the addressee would have green eyes *before* they actually saw the addressee's eyes, e.g., if the speaker knows the addressee's family all has green eyes. This same expectation is not conveyed by the use of *ja*.

The second difference is that *ja* may be used to introduce information that is new to the addressee only in the event that it is manifest to, or is able to be confirmed by, the addressee (Kraus, 2018). However, as we have shown, *of course p* does not require that *p* is known or available to the addressee. As shown in (31), the use of *of course* is felicitous only if *p* contains information that the speaker had some independent reason to expect. For example, while *ja* is acceptable in (32b), *of course* is acceptable only if the speaker knows that, for example,

the addressee is extremely clumsy, and so their spilling was somehow expected based on this knowledge.

(32)   *The speaker notices that the addressee has spilled coffee on her shirt.*
  a. *Du hast **ja** gekleckert.*
    you have JA spilled
    'You've spilled, you know.'   (Kraus 2018: 272)
  b. #You've spilled, of course.

3.3. Summary

We have shown in this section that, while *of course* shares an important core meaning of uncontroversiality with *doch* and *ja*, its usage differs in crucial ways. Unlike *doch p*, *of course p* does not convey that *p* is unexpected – and in fact, rather the opposite. Unlike *ja p*, *of course p* does not necessitate that the speaker believes that the addressee already believes or can immediately verify *p*, and *of course p* requires that the uncontroversiality of *p* be based on some information beyond that which is immediately accessible in the conversational context. Therefore, while all three particles have a degree of overlap in meaning, an analysis of *of course* cannot simply be collapsed into analyses of *doch* or *ja*. The next section presents and motivates an analysis of *of course* in which uncontroversiality is defined in probabilistic terms.

4. Analysis

We propose that *of course* marks a proposition *p* as **uncontroversial** for the speaker, as given in (33):

(33) <u>Definition 1</u>: When a speaker *s* utters *of course p*, she 1) asserts *p* and 2) presupposes that *p* is **uncontroversial** for *s* in the conversational context.

This section formally defines our notion of uncontroversiality, and demonstrates how it interacts with focus and general pragmatic reasoning to derive the possible interpretations of *of course* in different contexts.

4.1. Uncontroversiality

What does it mean for a proposition to be uncontroversial? With respect to *ja*, existing analyses converge on uncontroversiality as being a property of a proposition that holds for all speakers in a discourse. Kaufmann and Kaufmann (2012), for instance, indicate that a proposition *p* is uncontroversial if any rational agent under normal circumstances who wishes to find out whether *p* does so from readily available information. Similarly, the definition for *ja* given by Kraus (2018) makes explicit that *ja(p)* is licensed only when the speaker believes that everyone in the conversational context would expect *p* to be true.

While this intuitively aligns with the interpretation of *of course* in many contexts, the semantic imposition of the uncontroversiality of *p* on all conversational participants is too strong, as it does not allow us to capture the uses of *of course p* in which the speaker believes that *p* is not known to the addressee. Furthermore, it is clear from examples like (31) that *of course* poses certain restrictions on what evidence can be under consideration for calculating the obviousness

of *p*. Finally, as we saw in §2, we argue that *of course* is sensitive to focus, and that it is empirically desirable to capture the intuition that *of course* marks a proposition as uncontroversial *relative to its focus alternatives*.

Our solution for the first problem lies in relativizing uncontroversiality of a proposition to individual discourse participants. In this way, *of course p* can mark *p* as uncontroversial for the speaker, while leaving room for the speaker to not impose such a requirement on the addressee.

We define uncontroversiality formally using a probabilistic framework (Yalcin, 2010; Lassiter, 2011). In this framework, beliefs are modeled as functions from ⟨world, time, speaker⟩ triples to epistemic probability spaces ⟨E_{stw}, Pr_{stw}⟩, defined below.

1. E_{stw} is the set of propositions epistemically accessible from a speaker *s*, at time *t*, in a world *w*. $\bigcap E_{stw}$ provides the set of epistemically accessible worlds.

2. Pr_{stw} is a function from a finite set of possible worlds W to [0,1], where (i) $Pr_{stw}(\bigcap E_{stw}) = 1$, and (ii) $Pr_{stw}(p \cup q) = Pr_{stw}(p) + Pr_{stw}(q)$ if p, q are disjoint. A function g_{stw} maps from speaker, world, time triples to probability spaces.

3. Speakers assign probability distributions over an epistemic base E_{stw} via Bayesian conditioning, updating their distribution whenever they receive new relevant information.

A natural treatment of uncontroversiality in this framework is that a proposition *p* is uncontroversial simply if the speaker considers *p* more likely than its focus alternatives given what they know, as in (34):

(34)   Definition of uncontroversiality (preliminary):
        A proposition *p* is uncontroversial for a speaker *s* at time *t* given an epistemic probability space ⟨E_{stw}, Pr_{stw}⟩ and a contextually given probability threshold θ on (0,1], for all $q \in [\![p]\!]^f$, $Pr(p) - Pr(q) > \theta$.

But while this definition is promising, it is still not quite what we need. This formulation does not place any restrictions on the source of evidence for *p*, and thereby undesirably predicts *of course* to be licit in contexts where the speaker is committed to *p* but only on the basis of evidence in the discourse context. Instead, we need to capture the intuition that the probability of *p* when uttering *of course p* does not include evidence the speaker might have for *p* that was gathered at the utterance time.

More precisely, it seems that the information which the speaker has for *p* has to come from what she presents herself as believing is shared *background* knowledge with the addressee. We may think of the relevant knowledge base as being a subset of the speaker's epistemically accessible worlds, but restricted only to those propositions which were already accessible prior to the conversational context. We therefore modify our definition of uncontroversiality as follows:

(35)   Definition of uncontroversiality (final):
        Let *R* be the set of all propositions *r* in E_{stw} such that *r* is a proposition given by general shared beliefs, education, world-knowledge, or in-group social knowledge.
        A proposition *p* is uncontroversial for a speaker *s* at time *t* given an epistemic probability space ⟨R, Pr_{stw}⟩ and a contextually given probability threshold θ on (0,1], for all $q \in [\![p]\!]^f$, $Pr(p) - Pr(q) > \theta$.

Why probability?

Although we believe the probabilistic formalization given here for uncontroversiality is suitable for our needs, nothing crucial in our analysis rests on this particular choice of framework. We choose to define uncontroversiality probabilistically for two main reasons. For one, *of course p* can be felicitously uttered for some speakers even if *p* is less likely than ¬*p*, as long as *p* is nonetheless much more likely than any one alternative.

(36)   *A lottery is taking place in which a integer from 1-100 is selected. 1 is 49% likely to be selected, and 2-100 are all equally likely as one another.*
         A: Which number will they pick?
         B: #They'll pick 1.
         B': %They'll pick 1, of course.

While English speakers do not universally accept the B' response in (36), this is not surprising, since different speakers may not agree on a value for θ in a given context. Strikingly, however, there seems to be a preference for the B' response over the B response, which lacks *of course*. This is perhaps because *of course* makes explicit the comparison between *p* and its focus alternatives.

Second, it is not sufficient to say that *p* simply needs to be more likely than its focus alternatives to license *of course*; the difference in likelihood must be significant:

(37)   *Same lottery, except 1 is 2% likely to be selected, and 2-100 are still equally likely as one another.*
         A: Which number will they choose?
         B: #They'll pick 1, of course.

In (37), even though 1 is a more likely choice than any alternatives, its likelihood doesn't exceed that of the alternatives by all that much. Instead, we argue that $Pr(p)$ must exceed $Pr(q)$ for all the focus alternatives of p, $q \in [\![p]\!]^f$, by a contextually-determined margin. Therefore, a proposition with a low probability that is nonetheless more probable than its alternatives is not necessarily felicitously marked with *of course*.

4.2. Deriving Addressee Uncontroversiality

In §2, we observed that *of course p* often suggests that *p* is or should also be obvious/uncontroversial to the addressee as well as to the speaker. However, we also showed that addressee uncontroversiality is defeasible, and therefore cannot be included in the semantics of *of course*. Instead, we propose that the addressee effects are derived pragmatically by a defeasible inference generated by *of course*. We call this inference the *Shared Background Assumption*.

(38)   **Shared Background Assumption (SBA)**:

1.   *Of course p* presupposes that *p* is uncontroversial for the speaker in *w* at *t*.
2.   In a given *w* and *t*, the speaker may believe that they and the addressee(s) share equal access to *R*, given that *R* by definition consists of propositions which the speaker takes to be common knowledge.
3.   If the speaker assumes the addressee(s) have equal access to *R*, a pragmatic inference

is generated that *p* is or should be, based on this shared information, uncontroversial for the addressee as well as for the speaker.

4.2.1. When does the Shared Background Assumption hold?

The assumption that the speaker and addressee have access to the same information regarding the probability of *p* is not a hard requirement on the context; that is, it is not an entailment. We know that the Shared Background Assumption must be defeasible because there is not necessarily conversational infelicity when *of course* is used to modify a proposition that is not uncontroversial for the addressee, as we saw above. Instead, the Shared Background Assumption is context sensitive and depends on assumptions of the shared background between different speakers.

For example, in (39), whether speakers judge *of course* in Bartholomew's response as a) implying that Alphonse should have known the answer, or b) emphasizing that the Patriots will win, appears to correlate with their beliefs about how much people generally know about football. If a speaker assumes that Alphonse and Bartholomew share knowledge that the Patriots are a more successful football team than the Detroit Lions (on average), then they interpret Alphonse's statement as implying that Bartholomew should have known the answer to the question. However, if a speaker doesn't assume that Alphonse and Bartholomew share this background knowledge, then Bartholomew's response is interpreted only as emphasizing the uncontroversiality of the proposition that the Patriots will win.

(39) *Alphonse and Bartholomew are discussing an upcoming football game between the Patriots and the Detroit Lions.*
  A: Who will win the game?
  B: The Patriots will of course.

The context sensitivity of R can also explain Holmes' (1988) *manipulative* use of *of course*, in which the speaker may 'sneakily' propose a controversial discourse update:

(40) [Prime Minister Robert Muldoon in a TV interview]
  yes well Marilyn's got a thing about middle-aged males *of course* (ibid., 59)

(41) Asbestos is harmless in walls *of course*.

In these cases, the speaker does not truly believe that their addressees share the same background information for these utterances, but presents themselves as such. An addressee may naturally take the speaker's apparent assumption that their controversial choice of *p* is in *R* as an indication that *p* is something they should adopt in their own beliefs.

4.2.2. Comparison to *obviously*

The unilateral uncontroversiality requirement of *of course* may also explain differences between *of course* and similar particles such as *obviously*. For example, using *obviously* in a response to a sincere information-seeking question is generally considered rude, whereas *of course* in the same context need not be.

(42)   A: What time is it?
        B: 7 o'clock, obviously.
        B': 7 o'clock, of course.

Assuming B' takes A's inquiry to be genuinely seeking information, she knows that the SBA cannot hold, and *of course* does not generate the inference that A knew the time. If *obviously p* requires uncontroversiality (or something similar) to hold of the addressee as well as the speaker, then the rudeness of B's answer in (42) is expected, as B's assumption that the current time is uncontroversial for A is at odds with A's question.

5. Further Questions

Although our denotation for *of course* is broadly able to account for what kind of discourse moves it can occur in, there remain issues about its distribution that our account does not fill in. In this section we raise some of these concerns and propose possible avenues for investigation.

5.1. Whence positional variability?

Recall that in §2 we observed that *of course* displays positional effects, whereby it is not always interchangeable sentence-initially and sentence-finally. As we observed, *of course* is preferentially sentence-initial in response to declaratives or polar questions.

(43)   A: Did Maude make her famous strudel for the potluck?
        B: Of course she did.
        B': ?She did of course.

(44)   A: Maude made her famous strudel for the potluck.
        B: Of course she did.
        B': #/??She did of course.

However, in responses to wh-questions we observed that it generally prefers to sit sentence-finally.

(45)   A: What did Maude make for the potluck?
        B: #Of course her famous strudel!
        B': Her famous strudel of course!

We believe that this difference is not syntactic or semantic in nature, but is due to **prosodic** and **information structural** constraints. The main reason we believe the distribution is not syntactically or semantically constrained is that placing *of course* in initial position in responses to wh-questions improves when certain conditions are met. For example, initial *of course* is judged felicitous in responses to wh-questions in which the focused element receives contrastive focus (Zimmermann, 2008):

(46)   A: Who's going to come to the party?
        B: Of course ELAINE will, but Matt won't.
        B': ELAINE will of course, but Matt won't.

B's response is realized with the low surprise/redundancy contour, L*H*+L% (Kraus, 2018).

Of course is also judged acceptable by some speakers in initial position in responses to wh-questions whose set of possible answers is extremely restricted. For example, suppose that Maude was agonizing over whether to bring a strudel or cookies to the potluck. After the event, A can ask:

(47)   A: Which dish did Maude end up taking to the potluck?
        B: %Of course (she took) her strudel.

B's response is most acceptable with a pitch accent on *strudel* and a secondary accent on *of course*.

Because the positional preferences are sensitive to focus placement and to intonational contours, we believe the explanation for the effects lies in the domain of prosodic and information-structure well-formedness. Ongoing work is investigating these properties in greater detail.

5.2. Intonational Differences Across Uses

Closely related to the observations of the previous subsection are questions of how different intonational contours map onto different uses of *of course*. For example, the concessive use that we discussed in §2 has a distinct prosodic contour in which the stressed vowel of *of course* naturally undergoes mirative lengthening (Kraus, 2018). That is, in (48) the stressed vowel in *course* can be optionally lengthened compared to the stressed vowel in *course* in (49).

(48)   Concessive use:
        A: Who is trying out for the available orchestra seat?
        B: John is. Of course, so is Elaine.
        B': John is. Of co:urse, so is Elaine.

(49)   Polar question:
        A: Is Elaine trying out for the orchestra?
        B: Of course she is!
        B': ??/#Of co:urse she is!

We leave this interesting question for future investigation.

6. Conclusion

We have argued that *of course* presupposes that a proposition is 'uncontroversial' – significantly more likely than its focus alternatives and supported by evidence outside of the immediate discourse context – for the speaker. We have also shown that the intuition that *of course* signals *p* is uncontroversial for the addressee as well as for the speaker arises from a general pragmatic principle involving assumptions of shared beliefs and reasoning, rather than being part of *of course*'s semantics.

One contribution of our account is that it relies on a notion of uncontroversiality that is relativized to individuals, rather than being a property of propositions that must be satisfied by all discourse participants. This suggests that a one-size-fits-all approach to uncontroversiality is too broad to capture the nuances exhibited by different particles cross-linguistically, and that multiple detailed definitions of uncontroversiality are needed for full empirical coverage.

There is still much work to be done on sharpening the typological picture of uncontroversiality. How completely our account can extend to additional markers of uncontroversiality remains an exciting area of future inquiry. For example, our analysis allows for the possibility that, in addition to particles which signal uncontroversiality for the speaker alone, there are also particles which signal uncontroversiality for the addressee. Further work is also needed to determine the extent to which uncontroversiality interacts with other mechanisms for evidence-marking, such as sentential prosodic contours (Kraus, 2018; Goodhue and Wagner, 2018). We leave a detailed response to these interesting questions for future research.

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