Presuppositions under Contrastive Focus: Standard triggers and co-speech gestures*

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Abstract The semantic contribution of co-speech gestures is an open question: Ebert & Ebert (2014) claim they are supplemental, and Schlenker (to appear) argues they are presuppositional. Sometimes, however, they seem to be making an at-issue contribution, in particular, under Contrastive Focus (CF). I explore the projection patterns under CF for standard presupposition triggers and co-speech gestures and conclude that the two pattern closely together. I show that non-projection under CF can be caused locally, when the assertive content of the focused elements of the CF alternatives is not *contrastable* enough, so CF has to associate with the presuppositional content, for which the latter needs to be accommodated. Non-projection can also be caused globally, when the presupposition of one of the CF alternatives contradicts the presupposition or assertion of some other alternative, which I derive via the *alternative assertability* principle. I also look at supplements, namely, non-restrictive relative clauses, which interact with CF differently from standard presuppositions and inferences triggered by co-speech gestures. The observed differences are mostly attributable to the configurational properties of the different types of non-at-issue content, so it is unclear to what extent the data investigated in this paper could be used to independently argue for the presuppositional analysis of co-speech gestures and against the supplemental one.

Keywords: presuppositions, Contrastive Focus, co-speech gestures, local accommodation, supplements, post-speech gestures

1 Introduction

The status of inferences triggered by co-speech gestures (i.e., gestures co-occurring with a verbal expression) is a matter of debate. Schlenker (2015, to appear) argues, contra the analysis of co-speech gestures as supplements in Ebert & Ebert 2014, that co-speech gestures trigger assertion-dependent presuppositions (*cosuppositions*) of the form *if p, g*, where *p* is the verbal expression the gesture co-occurs with and

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g is the content of the gesture. The presuppositional nature of those inferences is evidenced by their projection behavior, for example, under negation:

(1) John didn't [kill]$^{\text{STAB}}$_  himself.[1,2]
$\rightarrow$ If John was to kill himself, he would stab himself.

It has been noted, however, that the inferences triggered by co-speech gestures at least sometimes don't project under Contrastive Focus (CF) on the word-gesture cluster (observation originally due to Rob Pasternak (p.c.)):

(2) John didn't [**kill**]$^{\text{SHOOT}}$_  himself, he [**killed**]$^{\text{STAB}}$ himself.
$\not\rightarrow$ If John was to kill himself, he would shoot/stab himself.

Similar effects have been observed for standard presupposition triggers under CF (see, e.g., (Simons et al. to appear) for a discussion on factive verbs, which are further discussed here in 3.1.3):

(3) If John **stopped** smoking, I'll give you $10, but if he never **used** to smoke, I'll only give you $5.
$\not\rightarrow$ John used to smoke.

In this paper I look at the projection patterns under CF in standard triggers and co-speech gestures, and conclude that the two pattern closely together. CF on a standard trigger or word-gesture cluster doesn't automatically result in non-projection, rather whether or not the inference is going to project depends on the nature of the CF

1 Each of the examples adduced in this paper has been discussed with at least three (usually more) native speakers of English. Any variation in judgements is accurately reported.

2 A note on notation:
- I indicate co-occurrence of a verbal expression with a gesture as follows: [verbal expression]$^{\text{GESTURE}}$.
- I illustrate new gestures with pictures after an underscore, e.g., [verbal expression]$^{\text{GESTURE}}$_picture.
- A gesture following a verbal expression is indicated as follows: verbal expression — GESTURE.
- A **word** written in bold indicates prosodic Contrastive Focus marking ((L+)H* pitch accent and lengthening on the stressed syllable, hyper-articulation, raised eyebrows, head nod, acceleration and/or increased amplitude of the gesture, etc.).
- An underlined <u>word</u> indicates prosodic Contrastive Topic marking ((L+)H*L-H% contour, gestural markers of prominence).
- A subscript $_{\text{F}}$ on a bracketed expression indicates that it is semantically in Focus.

alternatives. The specific subcases of non-projection fall under the following two general scenarios (which can also co-occur within a single example):

i. Non-projection is caused locally, at the level of the focused elements of the alternatives, when their assertive content is not *contrastable* enough and, thus, the CF cues have to associate with the presuppositional content. I propose that in order for the presuppositional content to become targetable by CF in this configuration, it has to be made part of the assertion, which can be done via local accommodation (e.g., as implemented in Heim 1983 or Schlenker 2009).

ii. Non-projection is caused globally, when a presupposition of one of the alternatives ends up contradicting either the presupposition or the assertion of some other alternative. While one might be able to account for all the subcases of this scenario by specifying fine-grained pragmatic reasoning for each subcase, I posit another uniform condition on Focus requiring that all the eventual propositional alternatives be in principle assertable with respect to the present common ground. If a presupposition impedes assertability of some alternative, it can't project.

Supplements, and in particular, non-restrictive relative clauses interact somewhat differently with CF, but those differences seem to be mostly due to their configurational properties. In standard presupposition triggers and word-gesture clusters the at-issue and non-at-issue content co-occur, which makes reassessment of the association of the prosodic CF cues possible when the at-issue content is not enough to make CF felicitous. In an NP modified by a non-restrictive relative clause, however, the two types of content have separate time slots, thus, assignment of prosodic cues needs to be changed altogether if the at-issue content (head nouns) is not contrastable. The changed prosody makes the non-restrictive interpretation impossible. All this has potentially interesting consequences for post-speech gestures, which are analyzed as supplements in Schlenker to appear and are configurationally similar to non-restrictive relative clauses, although here the current empirical picture is fuzzy.

The rest of the paper is organized as follows. In section 2 I describe two major constraints on CF that I use to explain some of the effects of CF on presupposition projection. In section 3 I show how those constraints account for the projection patterns under CF both for standard triggers and co-speech gestures and discuss what additional mechanisms need to be assumed to derive all the data. In section 4 I discuss the interaction of CF with supplements (namely, non-restrictive relative clauses) and some preliminary data on post-speech gestures. Section 5 is a conclusion.

2 Conditions on CF

Many cases of non-projection under CF, including those already illustrated in (2) and (3), involve contrast targeting the presuppositional rather than the assertive content

of an alternative. There are two relevant intuitions to capture here. First, we want to make sure that Contrastive Focus is in fact contrastive, i.e., that the elements we are trying to contrast can in fact be contrasted with each other. Second, we don't want the contrast to be due to non-at-issue material.

I thus propose two conditions on the felicity of CF. First, CF is only felicitous when the semantically focused elements of the CF alternatives are *contrastable*. For example, *[John]*$_{\text{F}}$ *killed himself* and *[Bill]*$_{\text{F}}$ *killed himself* are legitimate CF alternatives, because *John* and *Bill* can be contrasted with each other, but *John [killed]*$_{\text{F}}$ *himself* and *Bill [killed]*$_{\text{F}}$ *himself* aren't, because *killed* and *killed* cannot be contrasted with each other. Contrastability is gradient and not easily formalizable, but two things are certain: contradiction implies strong contrastability (e.g., *used to smoke* vs. *never used to smoke*; here by contradiction I mean that the denotations of the two predicates are disjoint), and identity implies strong non-contrastability (e.g., *killed* vs. *killed*). I will write $\alpha \blacklozenge \beta$ to indicate that α and β are contrastable.

Second, I propose that only at-issue material can be semantically focused (which might be independently evidenced by the fact that various Focus-sensitive phenomena like negation and questioning cannot target non-at-issue material). This constraint becomes especially relevant when a "two-dimensional" expression containing both at-issue and non-at-issue content bears prosodic CF cues. For example, if in ***stopped*** *P-ing* the assertive content is *doesn't P* and the presuppositional content is *used to P*, the CF cues on ***stopped*** can only be semantically associated with *doesn't*: *used to and [doesn't]*$_{\text{F}}$ *P*. The only way for the CF cues to be associated with *used to* (*[used to]*$_{\text{F}}$ *and doesn't P*) is if the latter is treated as part of the assertion (e.g., if it's locally accommodated), in which case it doesn't project. More generally, if we have an expression $\underline{\boldsymbol{\alpha}}\boldsymbol{\alpha'}$, where α is the presuppositional content, and α' is the assertive content, the default Focus association is α *and* $[\alpha']_{\text{F}}$, and $[\alpha]_{\text{F}}$ *and* α' is only a possibility if α is treated as part of the assertion.

The two principles clash when the at-issue content of a CF-ed two-dimensional expression is not enough to assure contrastability, for example, when there are two CF alternatives $\underline{\boldsymbol{\alpha}}\boldsymbol{\alpha'}$ and $\underline{\boldsymbol{\beta}}\boldsymbol{\beta'}$ such that $\neg(\alpha' \blacklozenge \beta')$. Here the default CF association — α *and* $[\alpha']_{\text{F}}$ and β *and* $[\beta']_{\text{F}}$ — results in infelicity. However, the presuppositions α and β can be accommodated, in which case associating the CF cues with them becomes possible: $[\alpha]_{\text{F}}$ *and* α' and $[\beta]_{\text{F}}$ *and* β'. If $\alpha \blacklozenge \beta$, CF will be felicitous. Note that under the cosuppositional analysis of co-speech gestures, (2) is an instance of this scenario: ***[kill]***^{SHOOT} and ***[kill]***^{STAB} are only legitimate CF alternatives if the CF cues are associated with the cosuppositional content supplied by the gestures, which requires treating that content as part of the assertion.

I would like to add an immediate caveat here that I remain agnostic as to whether presupposition triggering as such should be reduced to pragmatic reasoning on the set of alternatives (a program pursued, for example, in Abusch 2010). The data I look

at in this paper seem to be compatible with satisfaction theories of presupposition projection equipped with the mechanism of local accommodation as a last resort.

Before I proceed to show how the algorithm above applies in other cases and what additional mechanisms need to be assumed to derive all the data, I'd like to expand a bit on the condition banning non-at-issue content from being semantically focused. It is arguably not the case that no part of a non-at-issue chunk can ever be focused without making it at-issue. For example, in the following example the two non-restrictive relative clauses seem to contain subconstituents that are contrasted with each other without the non-at-issue material becoming at-issue (in particular, the content of the second relative clause projects despite being under negation):

(4) I like **Muscadets**, which are usually **acidic**, but I don't like **Muscats**, which are usually **sweet**.

Thus, this condition on CF needs to be refined. One could speculate that it only applies to two-dimensional expressions, i.e., non-at-issue material cannot be focused only when it co-occurs with at-issue material (so, essentially, it competes with at-issue material for the association of Focus cues and always loses unless it's made at-issue). This is not very satisfactory, though, in particular, because certain presupposition triggers like *too* or *again*, which don't seem to have any at-issue content, would then be expected to easily associate with CF without their presuppositions having to be accommodated. However, those triggers are in fact very reluctant to associate with CF, and even when they do, their presuppositions seem to be accommodated as well (see (27) in section 3.4 for an example).

An alternative explanation would capitalize on the intuition that the focused elements in the relative clauses in (4) are contained within non-at-issue superconstituents, but at the local point at which the condition is checked the at-issueness status of those superconstituents (and thus, their CF-ed subconstituents) is unavailable or irrelevant. Making this intuition more precise technically will, however, require making commitments about the architecture of grammar that I am not willing to make in this paper. For now I will set aside (4) and any further discussion of supplements (I will come back to the latter in section 4) and (quite literally) keep the focus on presuppositions in the next section.

3 Deriving the presupposition projection patterns under CF

In this section I review the main cases of non-projection under CF in standard triggers and co-speech gestures and show how they can be derived. I also adduce examples of projection under CF.

3.1 Contrast targeting presuppositional content

The algorithm sketched in section 2 applies when CF cues have to be associated with presuppositional content to make the focused elements of the alternatives contrastable. This scenario has a few subcases, which I review below.

3.1.1 Contrast targeting the presuppositional content of both alternatives

As I already showed in the previous section, under the cosuppositional analysis of co-speech gestures, examples like (2), replicated in (6) for conditionals[3], are perfect instances of contrast targeting presuppositional content: the verbal (i.e., assertive) content of the alternatives is identical and thus non-contrastable, and it is only the gestural (i.e., presuppositional) content that is contrastable.

(5) a. *Context (for all "suicide" examples in the paper): a video game in which the characters routinely kill themselves. Some characters can only kill themselves in one predetermined way, others have options. The speaker is making a bet on how the game is going to unfold.*
If John [**kills**]$^{\text{SHOOT}}$ himself, I'll give you $10, but if he [**kills**]$^{\text{STAB}}$ himself, I won't.
$\not\rightarrow$ If John kills himself, he will shoot/stab himself.

b. If you bring me a [**beer**]$^{\text{SMALL}}$ _  , I'll finish it, but if you bring me a [**beer**]$^{\text{LARGE}}$ _  , I'll have to share it with someone.
$\not\rightarrow$ If you bring me a beer, it will be small/large.

One could argue that in (5) non-projection happens because the cosuppositions end up being contradictory (the case discussed in 3.2). However, similar facts obtain even if the non-focused material of the eventual propositional CF alternatives is different:

(6) a. If John [**kills**]$^{\text{SHOOT}}$ himself and Bill [**kills**]$^{\text{STAB}}$ himself, I'll give you $10.
$\not\rightarrow$ If John kills himself, he will shoot himself.
$\not\rightarrow$ If Bill kills himself, he will stab himself.

3 From now on I primarily rely on examples with conditionals rather than negation (with a few exceptions), since the former are less likely to be instances of metalinguistic correction. Similar examples with modals (e.g., *might*) can be constructed for that end, too.

b. If John brings me a [**beer**]$^{\text{SMALL}}$ and Bill brings me a [**beer**]$^{\text{LARGE}}$, I'll be happy.
$\not\rightarrow$ If John brings me a beer, it will be small.
$\not\rightarrow$ If Bill brings me a beer, it will be large.

In other words, in this subcase non-projection is triggered locally, at the level of the CF-ed constituents. I have already explained how the proposal sketched in section 2 derives non-projection in such examples: the CF cues have to associate with the presuppositional (i.e., gestural) content of the CF-ed word-gesture clusters, because their assertive content is identical and thus non-contrastable (I write α vs. β to indicate that α and β are CF alternatives to each other):

(7) ***[kill]***^{SHOOT} vs. ***[kill]***^{STAB}:
\# P *and* $[P']_{\text{F}}$ vs. Q *and* $[Q']_{\text{F}}$, since $\neg(P' \blacklozenge Q')$
✓$[P]_{\text{F}}$ *and* P' vs. $[Q]_{\text{F}}$ *and* $[Q']$, since $P \blacklozenge Q$

But for the presuppositional content to be able to be semantically focused, it has to be made at-issue, for example, via local accommodation, typically allowed for in the so-called "satisfaction" theories of presupposition projection as a last resort mechanism (e.g., Heim 1983, Schlenker 2009). Thus, for (5) local accommodation would yield the following results:

(8) a. If (John kills himself and (John kills himself ⇒ John shoots/stabs himself))...
b. If (you bring me a beer and (you bring me a beer ⇒ the beer is small/large))...

Note that if we assume local accommodation here, we have to commit to narrow cosuppositions. Whatever generic inferences arise (e.g., killing oneself in general entails shooting/stabbing oneself, beers are in general small/large, etc.) have to be secondary, since we don't want results like *If (John kills himself and killing oneself in general entails shooting/stabbing oneself)...* or *If (you bring me a beer and beers are in general small/large)...*. This is in line with the view in Schlenker to appear.

3.1.2 Presuppositional content contrasts with assertive content

There are arguably no exact counterparts of the examples in (5) and (6) for standard presupposition triggers. There are, however, at least two cases involving standard triggers in which CF has to associate with the presuppositional content of one of the alternatives.

The first case, illustrated in (9), is when one of the alternatives contains a presupposition that contrasts with the assertive content of the other alternative.

(9) a. If John **stopped** smoking, I'll give you $10, but if he never **used** to smoke, I won't.
$\not\rightarrow$ John used to smoke.

b. If John **stopped** smoking and Bill never **used** to smoke, I'll give you $10.
$\xrightarrow{?\%}$ John used to smoke.

In (9) the assertive content of the two CF-ed elements — *doesn't* and *never used to*, respectively — is not identical. Yet, for many speakers it is not contrastable enough, especially in the presence of a much more salient contrast between the presuppositional content of *stopped* — *used to* — and the assertive content of *never used to*. But once again, for the CF cues to be able to associate with the presuppositional content, the latter needs to be accommodated.

(10) ***stopped*** vs. *never* ***used*** *to*:
?% P *and* $[P']_{\text{F}}$ vs. $[Q']_{\text{F}}$, since ?%$(P' \text{◑} Q')$ and $P \text{◑} Q'$
✓ $[P]_{\text{F}}$ *and* P' vs. $[Q']_{\text{F}}$, since $P \text{◑} Q'$

That said, the judgements for (9b) are less sharp and not unanimous. One of the speakers I consulted with did get the inference that John used to smoke in (9b), suggesting that for him the assertive content of the two CF-ed elements might be contrastable enough (or at least that he prefers to accept it as contrastable rather than do local accommodation, which is typically taken to be costly).

The judgements for (9a), however, are much more robust and unanimous: there is no projection. I propose that something additional is at play in (9a), in particular, the *alternative assertability* principle. This principle requires that all propositional Focus alternatives have to be in principle assertable with respect to the present common ground, regardless of the speaker's actual commitments about them. The consequence of this principle is that if an alternative cannot be asserted because of the requirements imposed on the common ground by the presupposition of some other alternative, the offending presupposition can't project.

In (9a) we end up with the propositional alternatives of the form $\underline{p}p'$ (*John stopped smoking*) and q' (*John never used to smoke*) where q' contradicts p. If the common ground has to entail p, q' ends up being non-assertable. The violation of the alternative assertability principle is categorical, hence the sharpness of judgements. No such thing happens in (9b), since the eventual propositional alternatives (*John stopped smoking* vs. *Bill never used to smoke*) are both assertable with respect to a common ground that entails that John used to smoke.

The alternative assertability principle will come in handy again in section 3.2 when we discuss non-projection due to the alternatives giving rise to contradictory global presuppositions. However, this principle cannot be used to derive all cases of

non-projection under CF, because (i) it only applies at the level of propositions and cannot account for the cases when non-projection is caused locally, i.e., when the non-focused material is different across the alternatives, such as (6) and (9b), since in those cases there will be no contradictions to capitalize on, (ii) it cannot on its own account for the case discussed in the next subsection (even when the focused material is the same across the alternatives).

Gestural counterparts of (9a) are given below in (11): the conditional inference triggered by the gesture in the first antecedent (*kills* ⇒ *shoots*) is contrasted with the verbal content of the second antecedent (*hangs*). Note that I switched from stabbing oneself to hanging in the second alternative, because *hangs* is more likely to entail *kills*, in which case the two are non-contrastable. Interestingly enough, in a similar example with *stabs* in the second antecedent, if stabbing oneself is understood to only entail wounding oneself, the cosupposition triggered by the gesture on *kill* does project (it is then the verbal content of *[kills]*^{SHOOT} that is contrasted with *stabs*)[4].

(11) a. If John [**kills**]$^{\text{SHOOT}}$ himself, I'll give you $10, but if he **hangs** himself, I won't.[5]
b. If John [**kills**]$^{\text{SHOOT}}$ himself and Bill **hangs** himself, I'll give you $10.
↛ If John kills himself, he will shoot himself.

(11) evokes examples with CF on verbs of manner in general (I believe the similarity was originally observed for verbs of motion by Anna Szabolcsi (p.c.)):

(12) a. Did John hang himself? (He said he would.)
→ If John killed himself, he hanged himself.
b. Did John **hang** himself or did he **shoot** himself?
↛ If John killed himself, he hanged/shot himself.

(13) a. Did John drive to the department yesterday? (I know he had an appointment with a student.)
→ If John went to the department, he drove.
b. Did John **drive** to the department yesterday or did he **bike** there?
↛ If John went to the department, he drove/biked.

There is some intuitive structural similarity between the gestural examples we have looked at and the examples in (12) and (13). In some sense, verbs of manner are

4 It also seems that contrasting content across modalities can sometimes feel weird — so there might be in fact a preference for the non-lethal stabbing reading.

5 The example is slightly odd, which I believe is due to (i) the already mentioned weirdness of contrast across modalities, (ii) the lack of structural parallelism between the two alternatives (the second alternative doesn't contain a gesture). One could also add a HANG gesture into the second antecedent — under Schlenker's story, we would just get a trivial cosupposition *hangs* ⇒ *hangs*.

also two-dimensional: they contain some generic component of meaning (like *kill* or *move*) as well the specific manner component. Since the most natural alternatives to verbs of manner are other verbs of manner that have the same generic meaning component, the CF cues typically associate with the manner component. I will, however, leave the parallel at that and won't pursue it further within this paper.

3.1.3 Presuppositional content contrasts with strengthened assertive content

The second case, illustrated in (14), is when one of the alternatives contains a presupposition that contrasts with a strengthened version of the assertive content of the other alternative.

(14) a. %If John **doesn't** smoke, I'll give you $10. But if he **stopped** smoking, I'll only give you $5.
b. %If John **doesn't** smoke and Bill **stopped** smoking, I'll give you $10.[6]
$\not\rightarrow$ John used to smoke.

There is apparently some variation with respect to the acceptability status of the examples in (14); one of the speakers I consulted with didn't accept them (the same speaker who got projection in (9b)). That is unsurprising, since those examples require some extra work. The two CF-ed elements have the same assertive content — *doesn't*. The second one also contains a presupposition — *used to* — which doesn't immediately contrast with anything in the first alternative (and it is, in fact, the lack of contrast that the speaker who did not accept (14) cited to explain his judgements). However, the natural interpretation of the first conditionals in (14) (according to those speakers who accept those examples and to my own non-native intuitions for English as well as native intuitions for the Russian counterparts of (14)) is 'if John doesn't smoke and didn't use to smoke before'.

I propose that the strengthening of the *doesn't* alternative is due to it being exhaustified with respect to *stopped* (after all, CF is often interpreted exhaustively): P' *and not* $\underline{Q}Q'$. Since $P' = Q'$, it amounts to P' *and not* $\underline{Q}P'$, which is a contradiction if Q is interpreted outside the negation (P' *and* Q *and not* P'). If Q is interpreted in the scope of the negation, we get P' *and not* $(Q$ *and* $P')$, which amounts to P' *and not* Q (i.e., *doesn't and didn't use to*). Now this case becomes straight-forward:

(15) ***stopped*** vs. ***doesn't (and not stopped)***:
$[P']_{\mathrm{F}}$ vs. Q *and* $[Q']_{\mathrm{F}}$, since $\neg(P' \blacklozenge Q')$
✓P' *and* $[$*not* $Q]_{\mathrm{F}}$ vs. $[Q]_{\mathrm{F}}$ *and* Q', since $Q \blacklozenge$ *not* Q

6 These examples are order-sensitive: switching the order of conditionals makes them quite odd.

At this point it would be appropriate to add a note on well-known examples of non-projection that pit *know* against *think*, such as:

(16) a. John doesn't **know** that Mary is pregnant, he (only) **thinks** that she is.
b. If John **knows** that Mary is pregnant, he should tell her parents, but if he (only) **thinks** that she is, he shouldn't.[7]
$\not\rightarrow$ Mary is pregnant.

One could conceive of (16) as another instance of non-projection under CF whereby the assertive content of the CF-ed elements is identical (i.e., *think (that p)* vs. *think (that p)*), and the presupposition triggered by *know* (i.e., *p*) is contrasted with the strengthening part of the second alternative (i.e., *think and not know (that p)*, which in this case would amount to *think and not p*).

However, that does not seem to be the interpretation we get: from the examples in (16) we do not normally infer that if the alternative with *think* is true, i.e., if John thinks (but doesn't know) that Mary is pregnant, then it's not true that Mary is pregnant. I don't think that's because exhaustification doesn't happen in this case — in fact, those examples are often better with an overt *only* modifying *think* — but rather that the assertive content of *know* and *think* is manipulated to become contrastable making *know* non-factive (hence the absence of the presupposition). In particular, *know* seems to be interpreted as something akin to *be sure*, i.e., 'believe with a high degree of certainty', and *think* is interpreted as, roughly, 'believe with a lower degree of certainty'. Naturally, this adjustment of meaning isn't cost-free either and only happens under pressure; here the pressure would be to make CF felicitous.

One final note is that, modulo certain assumptions, we could have used exhaustification to derive non-projection for the cases discussed in sections 3.1.1–3.1.3. We would just need to assume that CF alternatives cannot be self-contradictory, regardless of the speaker's commitments about them, and that our exhaustification operator *Exh* is a presupposition hole with respect to negated alternatives (the latter assumption is made, for example, in Spector & Sudo 2016).

Remember, when exhaustifying *doesn't* with respect to *stopped* we ended up with P' *and not* $\underline{Q}P'$. Since *Exh* projects the presuppositions of the negated alternative, if Q is allowed to project, we end up with a contradiction: P' *and* Q *and not* P'. But if we treat Q as part of the assertion, there is no contradiction: P' *and not* $(Q$ *and* $P')$.

The exact same logic applies to $[kill]^{SHOOT}$ vs. $[kill]^{STAB}$: $\underline{P}P'$ *and not* $\underline{Q}P'$ is a contradiction if Q is allowed to project: $\underline{P}P'$ *and* Q *and not* P' — but not if it is treated as part of the assertion: $\underline{P}P'$ *and not* $(Q$ *and* $P')$. Here both alternatives will be exhaustified with respect to each other, so neither P nor Q will project.

7 Note that these examples are not order-sensitive in the way the examples in (14) are.

As for *stopped* vs. *never used to*, if the presuppositional content of *stopped* is P and its assertive content is P', then the assertive content of *never used to* is *not* P. If P is allowed to project, exhaustifying *never used to* with respect to *stopped* yields *not P and P and not P′*, which is a contradiction. If P is treated as part of the assertion, no contradiction obtains: *not P and not* $(P$ *and* $P')$. Note that this result does not commit us to any status of P in case the propositional alternative containing this strengthened constituent is true (even though empirically in (9) we get the inference that P is not true of its argument in that case, which is perhaps due to some independent strengthening).

The problem with using exhaustification as a uniform principle to derive all the relevant data, however, is that it would fail to capture the difference between non-projection caused locally and globally. While we could assume that exhaustification applies at the predicate level and can, thus, derive non-projection even when the non-focused material is different across the alternatives, we would (i) fail to capture the difference in robustness of judgements between (9a) and (9b), (ii) yield the wrong predictions for the case when the alternatives have contrastable assertive content but trigger contradictory global presuppositions, which is discussed in the next section.

3.2 Contradictory global presuppositions with contrastable assertive content

A separate case of non-projection under CF, illustrated in (17), is when the assertive content of the CF-ed elements of the alternatives is contrastable, but the global presuppositions of the alternatives end up being contradictory.

(17) If John **stopped** smoking, I'll give you $10, but if he **started** smoking, I won't.
$\not\rightarrow$ John used to smoke (throughout some reference time).
$\not\rightarrow$ John used to not smoke (throughout the same reference time).

Crucially, if the global presuppositions triggered by *start* and *stop* end up being non-contradictory (which is the case whenever the non-focused material of the alternatives is different), the said presuppositions project:

(18) If John **stopped** smoking and Bill **started** smoking, I'll give you $10.
$\rightarrow$ John used to smoke.
$\rightarrow$ Bill used to not smoke.

In the *stopped* vs. *started* examples above the alternative contrastability principle is satisfied by the assertive content of the CF-ed elements of the alternatives alone and, thus, doesn't force non-projection. No additional considerations apply in (18), so the presuppositions project. This is not to say, of course, that they cannot be

accommodated for some other reason (*stop* and *start* are often considered to be weak triggers, after all), but crucially they don't have to.

The non-projection in (17) can in principle be explained without even making reference to Focus, simply by appealing to the definition of a presupposition[8]. A presupposition has to be entailed by the common ground, but no common ground can entail a contradiction, so it's impossible to project both presuppositions in (17). The problem with this simplistic explanation is that accommodating only one of the presuppositions should then be enough to avoid the said contradiction, so something additional needs to be said.

The easiest thing to do is to appeal to the alternative assertability principle proposed earlier in 3.1.2. If p has to be entailed by the common ground, an alternative of the form $\underline{q}p'$ where q contradicts p cannot be asserted with respect to that common ground even if the presupposition q is accommodated. Thus, neither presupposition can be entailed by the common ground.

I have not provided any motivation for the alternative assertability principle so far, though. It might very well be that there is no such uniform principle that applies mechanically across all the cases, but rather each specific case involves some high level pragmatic reasoning, which does in fact take into account the speaker's commitments about the alternatives. For example, in (18) one could say that it would be pragmatically odd for the speaker to utter a conditional whose antecedent is known to be false (which would have to be the case if we were to only accommodate one of the contradictory presuppositions while projecting the other one), thus, both presuppositions need to be accommodated. Examples in which one of the alternatives is negated would be less straight-forward, though:

(19) a. John didn't **stop** smoking, he **started** smoking!
$\not\rightarrow$ John used to smoke.
$\rightarrow$ John used to not smoke.

b. John didn't **stop** smoking, but he might have **started** smoking.
$\not\rightarrow$ John used to smoke.
$\overset{?}{\rightarrow}$ John used to not smoke.

In (19a) one could say that in fact only one presupposition is accommodated, namely, the one that John used to smoke. The other one could project, for all we know (although it would have to be an informative presupposition) — we wouldn't be able to tell the difference between local accommodation and projection in this case (the alternative assertability principle would predict local accommodation).

(19b) could be uttered in two scenarios: (i) the speaker assumes John used to not smoke and that's why the alternative *John stopped smoking* is false, (ii) the speaker

8 Thanks to Lucas Champollion (p.c.) for pointing this out to me.

doesn't assume anything about John's previous smoking status, but they are sure that if John smoked, he'd never stop. It is unclear, however, if the inference that John used to not smoke in (i) is due to projection. The alternative assertability principle would predict local accommodation of both presuppositions in either case.

I will end the discussion at that. The general take-home message of 3.1 and 3.2 is that sometimes CF causes non-projection of presuppositions locally, to make the contrast licit, and sometimes non-projection is caused globally, based on what propositional alternatives are acceptable given some pragmatic considerations. The two sources of non-projection can in principle co-exist, as is the case in (9a).

3.3 Examples of projection under CF

CF on a trigger doesn't always result in non-projection. If none of the considerations discussed in the previous two sections apply, the presuppositions happily project. I have already adduced an example of projection despite CF for *start* vs. *stop* in (18).

In examples with co-speech gestures, if the verbal content of the CF-ed word-gesture clusters is contrastable, the cosuppositions project, too:

(20) If you bring me a [**beer**]$^{\text{LARGE}}$, I'll finish it, but if you bring me a [**cocktail**]$^{\text{SMALL}}$, I'll have to share it with someone.
→ If you bring me a beer, it will be large.
→ If you bring me a cocktail, it will be small.

Once again, the assertive content of the CF-ed clusters is contrastable and can thus form licit CF alternatives without having to involve the presuppositional content. Since gestural cosuppositions are assertion-dependent, they cannot possibly be contradictory if the assertive content of the word-gesture clusters is contrastable.

Similarly, if an example contains two word-gesture clusters whose verbal content is identical and gestural content is different, but there is no CF on those clusters (so the conditions on CF don't apply to them), the cosuppositions still project:

(21) If John [kills]$^{\text{SHOOT}}$ himself **tomorrow** and Bill [kills]$^{\text{STAB}}$ himself on **Tuesday**, I'll give you $10.
→ If John kills himself, he will shoot himself.
→ If Bill kills himself, he will stab himself.

As for *stop* and *start*, instead of being pitted against each other, they can be pitted against alternatives with contrastable assertive content and nothing to contradict the presuppositions of *stop* and *start*, in which case the said presuppositions project:

(22) a. If John **stopped** smoking, I'll give you $10, but if he's just taking a **break** from smoking, I won't.[9]
b. Although John didn't **stop** smoking, he began to **hate** smoking.
→ John used to smoke.

(23) a. If John **started** smoking, I'll give you $10, but if he just **tried** smoking, I won't.
b. Although John didn't **start** smoking, he began to **tolerate** smoking.
→ John used to not smoke.

One important concern to address at this point is that control counterparts of examples in (22a) and (23a) with the presuppositional content p overtly made part of the assertion (thus, emulating the effect of local accommodation) might also give rise to an inference that p ((24); the effect is especially strong in (24b)[10]), which cannot be due to projection. I believe that effect to be due to external factors, but most importantly, it can be overridden, as shown in (25). I, thus, maintain that presupposition projection under CF in cases like (22a) and (23a) is genuine.

(24) a. If John used to smoke and **stopped**, I'll give you $10, but if he used to smoke and is taking a **break** from it, I won't.
$\overset{?}{\rightarrow}$ John used to smoke.
b. Did John used to smoke and **stop**, or did he use to smoke and take a **break** from it?
→ John used to smoke.

(25) a. If John **stopped** smoking, I'll give you $10. If he is taking a **break** from smoking, I'll give you $5. If neither is true, I won't give you any money.
→ John used to smoke.
b. If John used to smoke and **stopped**, I'll give you $10. If he used to smoke and is taking a **break** from smoking, I'll give you $5. If neither is true, I won't give you any money.
$\not\rightarrow$ John used to smoke.

3.4 A note on trigger "strength"

It is generally assumed that triggers vary in their "strength", i.e., in how susceptible they are to local accommodation. When it comes to the effects of CF, the generaliza-

9 Here, once again, some lexical adjustment happens to make the assertive content of the alternatives contrastable; in particular, *stop* is understood as 'stop completely' rather than 'stop temporarily'.
10 Unsurprisingly so; when someone asks a contrastive disjoint polar question, they normally assume one of the options to be true, which here would force the inference that p, since both options entail it.

tions discussed in the previous sections seem to apply even to some of the triggers that are typically considered "strong".

One such trigger is *regret*, and CF-ing *regret* in the absence of an overt alternative typically does not result in non-projection, which I would argue is because the most salient alternatives to *regret* are also factive (i.e., they have the same presuppositional content as *regret*) — as illustrated in (26a). However, if we set up the context in such a way that the salient alternative to *regret* entails the falsity of its complement *p* or the speaker's ignorance on whether *p* (both of which will contradict the inference that the speaker believes that *p*), we obtain non-projection, as shown in (26b).

(26) a. If John **regrets** cheating on his wife, I'll remain friends with him. (But if he takes **pride** in it, I won't.)
$\rightarrow$ John cheated on his wife.

b. *Context: A psychologist runs a psychotherapy group whose participants all either regret cheating on their wives ($\rightarrow$ they cheated) or (i) lie ($\rightarrow$ they didn't cheat) / (ii) claim ($\rightarrow$ the speaker doesn't know if they cheated) that they cheated on their wives. John is new to the group, the psychologist asks her assistant:*
Does John **regret** cheating on his wife or does he (i) **lie** / (ii) **claim** that he cheated on his wife?
$\not\rightarrow$John cheated on his wife.

Even *too*, which is a "super-strong" trigger, can in some cases be used assertively. Thus, in (27) the presupposition triggered by *too* is *someone other than John said that*, and the alternative that contains it is pitted against a contradictory alternative (roughly) *only John said that* (due to the exhaustive interpretation of Focus on *John*):

(27) *Context: A, B, and C discuss attribution of an idea.*
A: Who said that?
B: $[\text{John}]_{\text{F}}$ said that.
C: John said that, **too**. But Mary was the first to propose it.

Too, however, does not seem to allow for such uses in antecedents of conditionals, for example, which suggests that there is more to its "strength" than just the nature of its most salient alternatives. Yet, a comprehensive discussion of the typology of triggers with respect to their behavior under CF is outside the scope of this paper.

4 Contrast and supplements

There are two reasons to look at how CF interacts with supplements in this paper. First, that would tie in with the discussion on the status of co-speech gestures started

in Ebert & Ebert 2014 and Schlenker to appear. Second, we could see how the general conditions on CF posited here fare with respect to other types of non-at-issue content than standard presuppositions and co-speech gestures. Thus, in this section I will briefly look at the interaction of CF with non-restrictive relative clauses.

When two NPs with contrastable head nouns are contrasted with one another, the head nouns can bear CF cues and can be modified either by restrictive (marked as [R]) or non-restrictive (marked as [NR]) relative clauses:

(28) a. I like **beer** that is foamy and I like **wine** that is acidic. [R]
b. I like **beer**, which is foamy, and I like **wine**, which is acidic.[11] [NR]

In a similar configuration, but when the head nouns are non-contrastable, no CF cues can occur on the head nouns, and only the restrictive interpretation is available:

(29) a. *I like **beer** that is **alcoholic** and I like **beer** that is **foamy**. [R]
b. I like beer that is **alcoholic** and I like beer that is **foamy**. [R]
c. *I like **beer**, which is **alcoholic**, and I like **beer**, which is **foamy**. [NR]
d. %I like beer which is **alcoholic** and I like beer which is **foamy**. [R]

Under the story I have been telling in this paper, the two identical head nouns in the examples above cannot bear CF cues, because they are not contrastable. The expression *beer* is mono-dimensional, i.e., it consists of at-issue content only, so there is no additional content that the CF cues could associate with. To make the sentences acceptable, the CF cues have to be removed from the head nouns altogether, leaving the predicates in the relative clauses as the only locus of contrast.

The fact that only the restrictive interpretation is available in (29d) (for those speakers who accept restrictive relative clauses headed by *which* in the first place) can be explained in two ways (which are not mutually exclusive per se).

First, that could be solely due to prosody. A non-restrictive relative clause has to form a prosodic unit on its own, set off from the head noun with a boundary tone, resulting in the head noun necessarily bearing a nuclear accent. If the head noun cannot bear a nuclear accent, the non-restrictive reading becomes unavailable.

However, a more complex explanation is also possible, relating this bit of data to the condition banning non-at-issue content (of a two-dimensional expression) from being semantically focused. For that we need to assume that the prosodic units to which a CF accent is assigned in (29d) are the whole NPs with the relative clauses. Those NPs will then be in some sense two-dimensional, even though the at-issue and non-at-issue content won't share a time slot. Then we can proceed in the same way as for standard presupposition triggers and word-gesture clusters: the at-issue content of our NPs, i.e., the head nouns, is not contrastable, thus, CF cannot associate

11 Here it is irrelevant whether there are any CF cues on anything inside the relative clauses.

with it; the non-at-issue content, i.e., the non-restrictive relative clauses, has to be made at-issue (i.e., restrictive) for CF to associate with it.

Thus, there are some similarities in how CF interacts with standard presuppositions, inferences triggered by co-speech gestures, and non-restrictive relative clauses. In all the three cases non-at-issue content has to become at-issue to make CF felicitous. However, the process is quite different for standard presuppositions and co-speech gestures on the one hand and non-restrictive relative clauses on the other: (i) first, examples with relative clauses require prosodic adjustment while examples with standard presuppositions and co-speech gestures don't, (ii) second, making non-restrictive relative clauses restrictive is only possible for speakers who accept restrictive relative clauses headed by *which* in the first place while no such lexical restrictions exist for standard presuppositions and co-speech gestures.

Point (ii), however, is due to an idiosyncratic lexical property of English complementizers (no such issue should arise in languages that use the same complementizer for restrictive and non-restrictive relative clauses). Point (i), in its turn, is a natural consequence of non-restrictive relative clauses and the head nouns they modify occupying separate time slots. It is thus unclear to me to what extent the similarities between standard presuppositions and co-speech gestures, as opposed to non-restrictive relative clauses, can be seen as evidence in favor of the presuppositional analysis of co-speech gestures and against the supplemental one. The only uncontroversial conclusion from the data explored in this paper is that standard presuppositions and co-speech gestures share certain configurational properties that have consequences for their interaction with CF.

All this discussion can also be extended to post-speech gestures, i.e., gestures occurring after the verbal expression they modify, illustrated below:

(30) John killed himself — STAB[12].

Schlenker (to appear) suggests that post-speech gestures are best analyzed as supplements. Since post-speech gestures are indeed very similar structurally to non-restrictive relative clauses, they are expected to behave in a similar way with respect to the effects of CF. Indeed, (31b) (with CF cues on the two occurrences of *killed*) is unacceptable. The judgements for (31c) with no CF cues on *killed* are much fuzzier and variable. Some speakers fail to even produce the sentence, which is unsurprising, considering that that would require focusing the post-speech gestures (in parallel with (29d)), which is quite a non-trivial task. Those who manage to produce the target sentence report an essentially at-issue interpretation of the post-speech gestures, as if there was a silent *like this* co-occurring with the gestures.

12 Post-speech gestures — just like pro-speech gestures, i.e., gestures replacing a verbal expression — are often produced with some sort of iconic vocalizations; I omit those in my notation.

(31) a. Some soldiers [**killed**]$^{\text{SHOOT}}$ themselves, and some soldiers [**killed**]$^{\text{STAB}}$ themselves.
b. *Some soldiers **killed** themselves — SHOOT, and some soldiers **killed** themselves — STAB.
c. ?%Some soldiers killed themselves — **SHOOT**, and some soldiers killed themselves — **STAB**.

An additional complication for post-speech gestures is the gradient nature of temporal alignment. It is quite possible that if the prosodic break between the verbal expression and the post-speech gesture that modifies it is very small, the post-speech gesture can be essentially treated as a co-speech one. Clearly, more work, especially experimental, is needed on this and other issues discussed in this paper.

5 Conclusion

In this paper I have looked at how CF interacts with different types of non-at-issue content. I have shown that co-speech gestures pattern closely with standard presuppositions in this respect and made an attempt to account for the data at hand.

In particular, I have demonstrated that non-projection of both standard presuppositions and inferences triggered by co-speech gestures can be caused locally, at the level of the CF-ed elements, regardless of what the non-focused material of the alternatives is, when CF has to associate with presuppositional content. To account for that, I proposed that (i) the semantically focused elements of the CF alternatives have to be contrastable, and (ii) only at-issue material can be semantically focused (at least in two-dimensional expressions). Thus, when the assertive content of CF-ed triggers or word-gesture clusters is non-contrastable, the presuppositional content has to be accommodated so that the CF cues can be associated with it instead. I have also made use of additional mechanisms, namely, exhaustification and the alternative assertability principle, to account for some of the subcases of this scenario.

Non-projection can also be caused globally, when the CF alternatives give rise to contradictory presuppositions, which can be accounted for by appealing to the same alternative assertability principle, although other explanations are also possible.

Additionally, I have shown that supplements, and in particular, non-restrictive relative clauses, interact with CF differently from standard presuppositions and co-speech gestures, however, that difference can be attributed solely to the configurational differences between the two cases. Post-speech gestures, at first approximation, seem to pattern closer to non-restrictive relative clauses with respect to the effects of CF, which is unsurprising in view of their configurational properties. More fine-grained work, however, is needed on CF interacting with standard supplements and post-speech gestures, and in particular, on the prosody of such examples.

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