Elided indexicals[*]

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November 16, 2021

Indexical expressions raise interesting issues when involved in ellipsis phenomena, challenging both the theory of indexicality and that of ellipsis (Sag and Hankamer 1984, Bevington 1998, Chung 2000, Charnavel 2019). I develop here an account of indexicals in ellipsis sentences which crucially relies on conceiving ellipsis as a form of discourse anaphora and, as such, highly sensitive to pragmatic factors such as the question under discussion and at-issueness (Roberts, 2012), contrasting with approaches trying to define ellipsis through syntactic and/or semantic identity with a linguistic antecedent.

1 Introduction

The standard account of context-sensitive expressions such as *I, you, here, now - indexicals* in the terminology of Kaplan (1989) - states that these expressions must be interpreted in the actual context of utterance. However, it seems that this interpretive requirement is relaxed under ellipsis, as the following example shows:

(1) *Context: Romeo speaks to Juliet.* (Charnavel 2019: 4)

   A. *Romeo*: I love you.

   B. *Juliet*: I do ⟨ love { you (*supersloppy*) / myself (*strict*) } ⟩ too.[1]

(2) *Context: Romeo speaks to Juliet.* (Charnavel 2019: 5)

   A. *Romeo*: Do you love me ?

   B. *Juliet*: Do you ⟨ love { me (*supersloppy*) / you (*strict*) } ⟩ ?

    In (1), Juliet's answer contains an elided fragment that is two-ways ambiguous: either she could mean that she loves her own addressee (i.e. Romeo), or mean that she loves herself, i.e Romeo's addressee. Echoing the labels coined by Dahl (1973) and Williams (1977), Charnavel (2019) dubs the first reading 'supersloppy' and the second, 'strict', in order to relate constructions in (1)-(2) to those in (3):

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[*]I am indebted to Isabelle Charnavel and Yasu Sudo for their kind and insightful comments on the first version of this paper.

[1] Here and throughout the paper, I indicate elided material between ⟨ angled brackets ⟩.

(3)   John^i walks his$_i$ dog and Bill^j does ⟨ walk $\left\{ \begin{array}{l} \text{his}_j \ (\textit{sloppy}) \\ \text{his}_i \ (\textit{strict}) \end{array} \right\}$ ⟩ too.

As Charnavel (2019: 454) notes, while the 'strict' reading of B's answer can easily be accounted for by any treatment of ellipsis which assumes structural parallelism, the 'supersloppy' reading is "neither predicted by theories of VP-ellipsis nor by theories of indexicals", and as such challenges both.

In this piece, I will argue that this is only so if we adopt some form of *identity theory of ellipsis*, according to which ellipsis is derived by some kind of copying mechanism constrained by syntactic or semantic conditions (or both), such as parallelism (Fox 2000; Merchant 2001). Conversely, I will argue that an alternative account of VP-ellipsis as discourse reference, couched in Roberts' (2012) Question Under Discussion framework, can account for the data in (1), as well as additional examples of VP-ellipsis of the same kind.

This article is organized as follows. §2 introduces the problem regarding indexical expressions in elliptical sentences, and summarizes Charnavel's 2019 recent e-type account of it. §3 presents additional data that the e-type account, I argue, cannot straightforwardly account for. I then lay out an alternative model of ellipsis (§4) and apply it to the data at stake (§5). §6 discusses whether the phenomenon at stake is specific to indexicals; I argue, *pace* Charnavel (2019), that it is not. §7 discusses the role played by the additive particle *too* in the core examples. §8 concludes.

2   Charnavel (2019): the e-type account

Most formal analyses assume that the different readings of (3) above are produced by two underlyingly distinct logical forms at the ellipsis site: one involving a free variable co-referring with *John* in (4a.), and the other involving a variable bound by the closest λ-abstractor in the antecedent clause, whose argument is *Bill* (4b.).

(4)   John^i walks his$_i$ dog and

   a.   Bill^j does ⟨ walks his$_i$ dog ⟩ too.

   b.   Bill^j λ does ⟨ walks x_j dog ⟩ too.

However, according to the standard picture of indexicals laid out in (Kaplan, 1989), the meaning of first and second person pronouns escape the binding configuration exemplified in (4), because their semantic value crucially does not rely on the assignment function *g*, a function from indices to individuals that derives pronominal reference under binding (Heim and Kratzer 1998, Büring 2005). Being rigid designators in the sense of Kripke (1972), indexicals systematically take wide scope with respect to propositional operators and quantifiers. In order to capture this, Kaplan's system devotes a novel set of parameters, the *context*, that assign indexicals their reference prior entering semantic composition[2]. According to this system, once an indexical has been set to the corresponding parameter of a given context, it will then rigidly refer to this parameter. Consequently, while third person pronouns can be interpreted as variables

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[2] See Rabern and Ball 2017 for a thorough overview of Kaplan's system.

that can be bound by a lambda-binder manipulating the assignment function, this is not the case of indexicals, whose interpretation during semantic composition does not rely on assignments[3].

(5) a. $[\![\,\mathrm{I}_i\,]\!]^{g,c} = speaker_c$

  b. $[\![\,\mathrm{you}_i\,]\!]^{g,c} = addressee_c$

  c. $[\![\,\mathrm{he/she/it}_i\,]\!]^{g,c} = g(i)$

However, the data in (1)-(2) confront us with a dilemma. Since the value of indexical pronouns in ellipsis sites are systematically ambiguous and resemble the strict and sloppy readings in constructions such as (4) above, we could therefore assume that an analogous treatment must be applied to examples such as (1): the readings must be explained by the availability of elided pronouns to be bound (delivering a sloppy interpretation) or left free (delivering a strict interpretation) in the ellipsis site. Assuming such a solution would amount to treat 1st and 2nd person indexicals as 3rd person pronouns. But this clashes with the two-dimensional treatment of indexicals assumed by Kaplan (1989), which is designed to capture the fact that indexicals are not variables, but constants of a special sort.

From this, Charnavel concludes that "the key to understanding supersloppy readings does not lie in the theory of ellipsis, but in the theory of indexicals" (p. 457) and develops a novel theory of indexicality under ellipsis built on the proposals of Heim (1990, 1998) and Elbourne (2000, 2001, 2008) initially designed to account for cases of so-called 'donkey anaphora' (Geach, 1962) illustrated below:

(6) Every farmer who owns a donkey$_i$ beats it$_i$

In (6), the pronoun *it* co-varies with the donkeys - even though the NP *donkey* is unable to bind the pronoun due to its position in the structure. A traditional solution to this problem is to assume that the pronoun *it* in (6) is of a special type, referred to since Evans (1977, 1980) as 'e-type'. E-type pronouns are complex entities that can roughly be described as definite descriptions in disguise, containing a definite article and a phonologically null NP, itself consisting of two elements: a relational variable R, of type $< e, < e, t >>$ and whose value is contextually supplied, and a variable of type e that eventually gets bound by the null NP that c-commands it. In our example, this variable denotes the two-place relation between farmers and the donkey they own. The second variable can be assumed to be some kind of silent pronoun *pro*. Hence, the following structure for e-type *it* can be represented as follows:

(7) $[\![\,\mathrm{it}\,]\!]$ = [the [R *pro*]]

Charnavel proposes that, similarly, there exists 'indexical' e-type variants of 1st and 2nd person pronouns that explain their behavior in sentences like (1). Like their 3rd person counterparts, E-type indexicals are made of two variables: a silent *pro* variable

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[3] Ignoring ϕ-features like gender and number throughout, which can be added as presuppositions to the above entries (Cooper, 1983).

of type e and a relational variable INTER of type $<e,<e,t>>$ that is inherently indexical, relating discourse participants to each other[4]. The INTER function is defined as follows:

(8) $[\![$ INTER $]\!]^{g,c} = \lambda x. \lambda y\ y$ is an interlocutor of $x\ |\ \{x,y\} \in \{s_c, a_c\}$

INTER is a relational function that maps discourse participants in the context of utterance c to each other. Its indexical nature guarantees that the silent *pro* part of the elided e-type indexical can only be bound by another indexical pronoun, namely, the subject pronoun of the elided clause:

(9) $[\![$ I $\langle$ love you $\rangle$ $]\!]^{g,c} = $ I$_i$ love the INTER (pro_i), where $pro_i \in \{s_c, a_c\}$

Crucially, this analysis stipulates that *pro* in the above structure must be bound by another indexical. Charnavel (2019) take the following examples, for which the super-sloppy reading is dispreferred, as an empirical support for her claim:

(10) *Context: Paul is talking to his sister Julie.*　　　　　(Charnavel 2019: 36)

　　A. *Paul*: The man I hate loves you.

　　B. *Julie*: The woman I hate does not $\langle$ love $\left\{ \begin{array}{c} \text{me} \\ {}^{\#}\text{you} \end{array} \right\}\rangle$.

(11) *Context: Paul is talking to his sister Julie.*　　　　　(Charnavel 2019: 37)

　　A. *Paul*: The woman you hate loves me.

　　B. *Julie*: The man you hate does not $\langle$ love $\left\{ \begin{array}{c} \text{you} \\ {}^{\#}\text{me} \end{array} \right\}\rangle$.

This is expected under Charnavel's account, since in both (10) and (11), the overt indexicals are embedded within a relative clause headed by a definite NP and therefore, cannot bind the *pro* variable in the e-type indexical within the ellipsis site. Similarly, her account rules out supersloppy readings in configurations where no indexical is present in the antecedent:

(12) *Context: Paul is talking to his sister Julie.*　　　　　(Charnavel 2019: 38)

　　A. *Paul*: Jonathan voted for me.

　　B. *Julie*: Mike did $\langle$ vote for $\left\{ \begin{array}{c} \text{you} \\ {}^{\#}\text{me} \end{array} \right\}\rangle$ too.

(13) *Context: Paul is talking to his sister Julie.*　　　　　(Charnavel 2019: 39)

　　A. *Paul*: The handsome neighbor loves you.

　　B. *Julie*: His sister does not $\langle$ love $\left\{ \begin{array}{c} \text{me} \\ {}^{\#}\text{you} \end{array} \right\}\rangle$.

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[4] In that, Charnavel follows and refines previous insights from Rebuschi (1994, 1997) and Chung (2000) that also model the meaning of indexicals in examples like (1) in a relational manner to each other. See Charnavel (2019), sec. 2.2.1 for a discussion of their analyses.

(14) *Context: Paul is talking to his sister Julie.* ([Charnavel 2019](): 41)

    A. *Paul*: The handsome neighbor loves you.

    B. *Julie*: I do $\langle$ love $\left\{ \begin{array}{c} \text{him} \\ \text{myself} \\ ^{\#}\text{you} \end{array} \right\}$ $\rangle$ $^{\#}$(too).

However, the data under scrutiny point towards two different paths of analysis, each of which could provide a possible solution to the problem just outlined. One could choose, alongside [Bevington]() ([1998]()) and [Charnavel]() ([2019]()), to amend the kaplanian treatment of indexicals, and leave the theory of ellipsis untouched. In §§[4]() - [5](), I will explore the other solution, and propose a treatment of ellipsis that will allow us to maintain kaplanian orthodoxy while accounting for problematic cases such as [(1)](). In what follows, I shall present [Charnavel]()'s e-type account of elided indexicals.

3   Some additional data

A crucial observation to be made concerns the status of indexicals themselves in configurations like [(1)](); indeed, it seems that strict/supersloppy alternations also arise with 3rd person pronouns:

(15)   A. He^i loves her^j.

    B. She$_j$ does $\langle$ love $\left\{ \begin{array}{c} \text{him}_i \\ \text{herself}_j \end{array} \right\}$ $\rangle$ too.

Note that supersloppy readings also arise in configurations featuring only one speaker:

(16)   I^i love you$_j$ and you^j do $\langle$ love $\left\{ \begin{array}{c} \text{me}_i \\ \text{yourself}_j \end{array} \right\}$ $\rangle$ too.

(17)   He^i loves her$_j$ and she^j does $\langle$ love $\left\{ \begin{array}{c} \text{him}_i \\ \text{herself}_j \end{array} \right\}$ $\rangle$ too.

However, introducing a novel discourse referent prevents the supersloppy reading to arise:

(18)   A. He^i loves her^j.

    B. The neighbor^k does $\langle$ love $\left\{ \begin{array}{c} \text{her}_j \\ ^{\#}\text{him}_i \\ ^{\#}\text{himself}_k \end{array} \right\}$ $\rangle$ too.

The above data suggests that (super)sloppy readings are part of a more general phenomenon involving discourse reference, rather that stemming from the indexicality of 1st and 2nd person pronouns themselves.

On the other hand, in configurations where the indexical targets are 'unbound' in their antecedents (i.e., in configurations where the binder is not an indexical itself, and

thus cannot bind the second indexical in the antecedent) as (14) repeated here, the elided pronoun can refer back to either *the handsome neighbor* or B, but not to A:

(14)   A.   The handsome neighbor loves you.   (Charnavel 2019: 41)

       B.   I do ⟨ love $\left\{ \begin{array}{c} \text{him} \\ \text{myself} \\ \text{\#you} \end{array} \right\}$ ⟩ too.

In the e-type framework, this gap is explained by the very nature of the function INTER, which prevents any such binding, since it can only bind a variable denoting a participant in the conversation (Charnavel 2019: 473). However, if this is true that (14) cannot have *you* as a possible value in the E(llipsis)-site, modified versions of this example show us that this is quite easy to accommodate - with coordinated subjects for instance, as in (19):

(19)   A.   The neighbor and I love you.

       B.   I do ⟨ love $\left\{ \begin{array}{c} \text{you both} \\ \text{you} \\ \text{him} \\ \text{myself} \end{array} \right\}$ ⟩ too.

(20)   A.   Did you know that three boys love you in the class ? Mark, Paul... and me.

       B.   I do ⟨ love $\left\{ \begin{array}{c} \text{Mark} \\ \text{Paul} \\ \text{you} \\ \text{all three} \\ \text{myself} \end{array} \right\}$ ⟩ too.

It seems that, in the above cases, available interpretations for the elided pronoun in B's answers co-vary to some extent with the available referents introduced by A's statement: crucially, the supersloppy reading will be accessible if A's statement contains an indexical referring to A.

Another problem concerns modified versions of the examples involving relative clauses, where the answers in B feature indexicals in subject position:

(21)   A.   The man I hate loves you.

       B.   I do ⟨ love $\left\{ \begin{array}{c} \text{him} \\ \text{myself} \\ {}^{\#}\text{you} \end{array} \right\}$ ⟩ too.

Here again, the supersloppy reading is unavailable: the elided pronoun is able to take *The man you hate* as a referent, but not *you*. This is paralled by other structures involving non-restrictive relative clauses (NRRCs), as in (22):

(22) A. The handsome neighbor, which I don't like very much, loves you.

   B. I do ⟨ love $\left\{ \begin{array}{c} \text{him} \\ \text{myself} \\ {}^{\#}\text{you} \end{array} \right\}$ ⟩ too.

However, supersloppy readings may fail to arise, even when the indexicals contained in the antecedent are in the right configuration to fill in the INTER function. This is the case with (56):

(23) *Context: Claire is talking to a neighbor.*   (Charnavel 2019: 475)

   A. I came across your daughter yesterday.

   B. I did ⟨ come accross $\left\{ \begin{array}{c} \text{my} \\ {}^{\#}\text{your} \end{array} \right\}$ daughter ⟩ too.

In order to account for the above example and the like, Charnavel (2019) has recourse to pragmatics, explaining that the relation between the two speakers in the context has to be made "highly salient and relevant" (p.475). As we will see, the present account explains cases like (56) straightforwardly.

All in all, it appears that e-type readings of elided indexicals are not so much constrained by the distribution of their potential binders but rather, by the available discourse referents introduced, although some configurational restrictions arise with different types of relative clauses, some of which will be analyzed further in section 5.3.

Last, note the obligatory presence of the additive particle *too* in Charnavel's crux example: without it, B's answer cannot be taken as a statement of love in return, be it strict or sloppy[5].

(25) A. I love you.

   B. I do ⟨ love $\left\{ \begin{array}{c} \text{you} \\ \text{myself} \end{array} \right\}$ ⟩ ${}^{\#}$(too).

We will see that the theory adopted here felicitously predicts this: as it will be argued in the following sections, the key notion to understand the correct pattern exemplified by the above data is *topicality*, i.e. the *aboutness* relation between a proposition and a discourse entity, rather than binding. More precisely, I will argue that the availability of a dedicated discourse topic (understood in terms of QUD-aboutness) is what restricts the possible readings available in the above cases. In what follows, I shall introduce the QUD-model of ellipsis, and discuss further the notions of topicality and aboutness.

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[5] Analogous observations can be formulated for French:

(24) A. Je t'aime.

   B. Moi ${}^{\#}$(aussi) ⟨ $\left\{ \begin{array}{c} \text{je t'aime} \\ \text{je m'aime} \end{array} \right\}$ ⟩ .

Note that, since French does not allow VP-ellipsis, (24) is an instance of cross-clausal stripping (Dagnac, 2019). We leave French data for further research.

4 The question-under-discussion model

My proposal in order to deal with the above issues is to make use of a formal model of discourse structure, the question-under-discussion model of Roberts (2012). Such a model has already proved fruitful in the treatment of various ellipsis phenomena, such as VP-ellipsis (Kehler and Büring 2007, Keshet 2013, Kehler 2016, Elliott et al. 2016), sluicing (AnderBois 2010, 2014, Barros 2014, Kotek and Barros 2018), fragment answers (Weir, 2014), as well as issues related to presupposition projection (Roberts et al. 2009, Simons et al. 2010) the distinction of at-issue vs not at-issue content (Tonhauser et al. 2013, Koev 2013, Koev 2018) and information structure (Büring 2003, Roberts 2012).

Roughly, my proposal is that the distribution of strict and (super)sloppy readings in cases discussed above can be adequately captured when it is assumed that ellipsis sites are viewed as answers to (sometimes implicit) questions that the interlocutors have in mind when they steer the conversation: those questions, as well as other kind of semantic/pragmatic information, such as the available discourse referents that can serve as antecedents for pronominal reference, restrict the range of available alternatives that the ellipsis site can denote. This model, supplemented by an analysis of topics and the additive particle *too,* can account for the behavior of elided pronouns in VP-ellipsis. In what follows, I shall expose the main features of the model before turning to the QUD approach to ellipsis.

4.1 Utterances, questions, and the structure of discourse

When we talk, what we say does not occur randomly: utterances are meaningful strings of sounds tied together by organizational principles, rules in a language game (in the sense of Lewis 1979) that speakers follow in order for information to go through.

In a QUD model, assertions and questions alike are viewed as inquiries about the 'big question', *what is the way things are* (Stalnaker, 1978). Speech acts can then be viewed as discourse moves that follow a strategy of inquiry shared by the interlocutors (Roberts, 2012). Each discourse move is dependent on a prior QUD, be it explicit or implicit: as a consequence, in order to be relevant, assertions and questions must assess the QUD:

(26) **Relevance for discourse moves** (Roberts 2012: 21)
A move *m* is *relevant* to the QUD *q* iff

 a. *m* introduces a partial answer to *q* (*m* an assertion); or

 b. *m* is part of a strategy to answer *q* (*m* a question).

In most cases, assertions do not provide complete answers to the QUD. Rather, assertions are likely to provide partial answers to it, i.e. be compatible with a restricted set of more specific questions that stand in a subset relation to the higher, more general QUD. Questions are organized in a hierarchical stack to which they are added to as the conversation proceeds, and assertions can be viewed as implicit answers to these questions. For instance, a statement of the form

(27) Margaux will wear her turquoise emerald tonight.

Can be viewed as an implicit answer to the following questions, which are organized in a subset-superset relation:

1. What will Margaux wear tonight?

   (a) What kind of jewel will Margaux wear tonight?

      i. Will Margaux wear her purple amethyst?
      ii. Will Margaux wear her blue sapphire?
      iii. ...

   (b) When will Margaux wear her emerald?

   (c) ...

The semantic value of the QUD is the set of complete answers to it (Hamblin 1976, Karttunen 1977):

(28) ⟦ What will Margaux wear tonight? ⟧ = $\lambda p.\exists x.\ (p = \lambda w.$ Margaux will wear x in $w)$

Prosody can also alter the QUD in significant ways: focus marking, for instance, can introduce novel sets of alternatives to which the prosodically marked element is a member of:

(29) a. Margaux will wear [her turquoise emerald]^F tonight.
       ↝ Margaux won't wear anything else tonight.
       ⟦ QUD ⟧ = { What x will Margaux wear tonight ? | $x \in D_e$ }

      b. Margaux will wear her turquoise emerald [tonight]^F.
       ↝ Margaux won't wear it any other time.
       ⟦ QUD ⟧ = { When is the time t s.t. Margaux will wear her TE ? | $t \in D_r$ }

4.2 Ellipsis and the QUD

Most formal analyses of ellipsis in the generative tradition have analyzed the process in terms of syntactic and/or semantic *identity* with some linguistic antecedent (Ross 1969, Sag 1976, Williams 1977 , Fiengo and May 1994, Merchant 2001, Chung 2006, Merchant 2013, Rudin 2019, among many others). However, there is ample evidence that ellipsis is sensitive to discourse structure broadly conceived, rather than depending narrowly on some structural constraints holding between the elided material and some linguistic object. VP-ellipsis, in particular, is known for displaying especially flexible licensing conditions to this respect, being non sentence-bound but discourse bound (30), insensitive to islands (31) and allowing for backwards anaphora or cataphora (32):

(30) I disagree with the writer who says funeral services should be government-controlled. The funeral for my husband was just what I wanted and I paid a fair price, far less than I had expected to pay. But the hospitals and doctors should be ⟨ government controlled ⟩.   (Hardt 1993; (105))

(31) John didn't hit a home run, but I know a woman who did ⟨ hit a home run ⟩.
                                                        (Sag 1976; (1.1.8))

(32)   Although Sandy said she didn't ⟨ go to the store ⟩, Besty actually did go to the store.   (Sag 1976; (1.1.12 a))

In fact, in light of the data above, it could be argued that any form of ellipsis that exhibit this kind of behavior should be analyzed as a form of anaphora with no specific licensing mechanisms needed (Winkler 2011, Kehler 2019, Poppels 2020 a.o.). For the present purposes, I will take an intermediate stance on the subject and assume ellipsis to be a general process of phonological reduction of given semantic material (Rooth, 1992a) that can be identified as a possible answer to a question-under-discussion in the sense discussed above, following a relatively recent but rife literature (AnderBois 2010, 2014, 2016, Barros 2014 on sluicing; Weir 2014 on fragment answers; Kehler 2016, Elliott et al. 2016 on VP-ellipsis). In the present system, the semantic value of the QUD raised by an element α equates the set of propositions that answer it (*per* Hamblin semantics). This amounts to saying that the QUD represents the focus alternatives of α, as in Rooth (1992b).

However, and this is important - note that the status of α, here, is not defined, and is crucially *not* equated with what a number of ellipsis theories call the *antecedent*. α can be the antecedent, but need not be: it can also be another, salient proposition (or, in our case, a salient VP) entailed by the context. I will come back to this in §5.4[6]. I will therefore write $⟦\,\alpha\,⟧$ for the standard semantic value of α, and $\|\alpha\|$ for its focus semantic value, i.e. the set of alternatives to α under focus[7]. Ellipsis is licensed when the content of the elided clause is part of the QUD, that is, when the alternatives it denotes are the same as those required to answer the QUD. This is the question-answer *congruence* condition, that can be defined as follows:

(33)   **Congruence**   (Roberts 2012: 31)
       β is congruent to a question α iff $⟦\alpha⟧ = \|\beta\|$.

Congruence posits that in order to be felicitous, the alternative semantic value of a given assertion *S* must be part of the alternatives denoted by the question it aims at answering. As we will see, congruence will play a crucial role in predicting available readings for strict/sloppy cases of pronoun resolution.

A challenge to syntactic and/or semantic parallelism theories of VP-ellipsis in the generative tradition are sentences such as (34) which allow a sloppy reading of *him* (indexed to *John*), in spite of the antecedent being unable to provide a syntactic configuration that would license binding in that case (the pronoun *him* being already bound by the QP *every boy*):

(34)   Every boy in Mrs. Smith's class hoped she would pass him. In John[i]'s case, I think she will ⟨ pass him$_i$ ⟩.   (from Kehler (2016), ex. (10))

Kehler (2016) analyzes (34) as involving a contrastive topic realized as the appositive *in John's case*, introducing a novel sub-QUD within the discourse tree, of the form *will Mrs. Smith pass John ?*. A consequence of this analysis is that, crucially, there is no

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[6] A similar proposal can be found in Kroll (2019) for sluicing, although in a different setup using dynamic semantics.

[7] Note that alternatives must be *proper*: thus, α cannot be an alternative of itself.

re-binding of the pronoun in the ellipsis clause: rather, the pronoun obtains its reference through the QUD, being pragmatically identified as referring to the contrastive topic *John*. Here, ellipsis is not licensed by direct parallelism with the antecedent; rather, it is triggered by focus-matching against the alternatives denoted by the *implicit* QUD inferred from the contrastive topic *in John's case*, of the form

(35)   QUD (34) = { What about John$_i$? Will Mrs. Smith pass him$_i$? }

In order to allow focus-matching against accommodated QUDs *via* antecedents, Kehler (2016) proposes the following condition:

(36)   **QUD - Ellipsis licensing condition**   (Kehler 2016: 522)
       For ellipsis clause C$_E$ and antecedent clause C$_A$ for which $[\![C_A]\!]^g \in \|C_E\|^g, QUD = \|C_E\|^g$

In sum, this condition states that the available alternatives of an ellipsis site equal the possible congruent answers to the QUD, on the condition that the meaning of the antecedent clause be a member of that set. This is a restatement of Rooth (1992a) parallelism condition that crucially allows ellipsis to be licensed if the parallel domain of the ellipsis clause includes not only the antecedent, but the congruent answers to the QUD as well.

5   *You* and *I* under discussion

5.1   The proposal in brief

Following Kehler's proposal, I suggest an analogous treatment of indexicals under ellipsis that does not assume re-binding at LF, and argue that examples such as (1) should not be treated on a par with (3).

In brief, my proposal is that the 'supersloppiness' of readings such as (1)B arise because of a massive ambiguity that is generated at a pragmatic level: more precisely, the source of the ambiguity is located at the level of the QUD that B's answer is meant to address. On this view, different interpretations obtain given what the QUD from B's perspective is. Strict readings arise when B's answer targets a more specific QUD introduced by A's statement - a sub-QUD whose answer set is a subset of the main QUD. On the other hand, supersloppy readings arise when B's statement answers the same QUD as A. In most configurations, both readings are licensed because they are essentially compatible with both QUDs; however, some contexts arguably favor one reading over the other, while others completely rule it out. I will address these cases in turn.

5.2   The core cases

Consider (1), repeated here for convenience:

(1)   *Context: Romeo speaks to Juliet.*   (Charnavel 2019: 4)

   A.   *Romeo*: I love you.

   B.   *Juliet*: I do ⟨ love $\left\{ \begin{array}{l} \text{you (\textit{supersloppy})} \\ \text{myself (\textit{strict})} \end{array} \right\}$ ⟩ too.

Upon utterance of (1a), A's assertion answers the following QUD (the QUD can be either explicit or implicit; more on this below).

(37)   QUD (1A) = { Who loves whom ? }

As proposed above, the meaning of the QUD is the set of possible answers to it:

(38) $[\![$ QUD (1A) $]\!]$ = { x loves $x \mid x \in D_e$ }

B's utterance in (1B) has to be interpreted within a global strategy to inquiry aimed at answering the QUD introduced by A. But A's utterance itself can be interpreted as introducing a novel sub-QUD whose meaning is a subset of the original QUD:

(39)   a.   Sub-QUD (1A) = { Who loves Juliet ? }

     b. $[\![$ Sub-QUD (1A) $]\!]$ = { x loves Juliet $\mid x \in D_e$ }

It follows from this that Juliet's answer can be ambiguous in two ways: either her utterance will answer the QUD in (37), or it will answer the Sub-QUD in (39). Both answers will license ellipsis the same way, but with different meanings. If Juliet aims at answering (39), then her utterance will have the following meaning:

(40)   { *Who loves whom ?* }
     { *Who loves Juliet$_i$?* }

    A.   I love you$_i$.

     { *Who else loves Juliet$_i$?* }

    B.   I do ⟨ love myself$_i$ ⟩ too.

The semantic value of the ellipsis site is a possible answer to the the sub-question introduced by Romeo, namely *who loves Juliet ?*, which meaning is a subset of the broader question *who loves whom ?*. In turn out that, under the strict reading, the focus value of the ellipsis clause (C_E) is part of the alternatives denoted by the subquestion *who loves Juliet ?*:

(41) $\|C_E$ (40)B$\|$ = $\{$ x loves Juliet $\mid x \in D_e$ $\}$

The congruence condition is satisfied and, as a consequence, ellipsis is licensed under the strict reading.

Consider now the other, supersloppy reading available for Juliet's answer. Here, no sub-question is identified as part of the strategy of inquiry and B's utterance is taken to address the same QUD as A, *who loves whom ?* - a question about the other, salient individuals who share the property of loving:

(42)   { *Who loves whom ?* }

    A.   I love you.

     { *Who (else) loves whom ?* }

    B.   I do ⟨ love you ⟩ too.

This corresponds to the following alternatives:

(43) $\|C_E \ (42)B\| = \{\ x \text{ loves } x \text{ in } c \mid x \in D_e\ \}$

Note that, in that configuration, the focus value of C_E is fully compatible with the QUD *who loves Juliet?*, ambiguity arises, in this case, precisely because B's utterance is compatible with *both* QUDs above.

That cannot be the whole story, however: since the value of the elided pronoun is not specified (i.e., can be identified with any individual), something needs to be said about why, in supersloppy readings, the individual identified within the ellipsis site refers to the subject of the first utterance.

5.3   Supersloppy readings and contrastive topics

A distinct signature of supersloppy readings is their chiasmus-like structure, whereby the referent of the pronoun in the ellipsis site, i.e. the object of loving, is identified with the subject of the first utterance, i.e. the lover. Consider alternatives of the following form:

(44) $\{\ x \text{ loves } x \mid x \in D_e\ \}$

Unconstrained, such alternatives represent a potentially very big set. Of course, the property of loving in the present setting does not range over every individual, but merely over those salient in the discourse model. Here, following Roberts (2010, 2011), I will assume that such restrictions arise via a constraint that filters the possible answers to an established QUD regarding the potential referents the question is about:

(45) **Relevant discourse referents (RDR)**   (Roberts 2010, 2011)
      In a discourse with scoreboard S, discourse referent $d \in$ DR (the set of discourse referents) is Relevant to the QUD Q just in case for some property P, the question of whether d has P is evidently Relevant to Q.

A welcome result of such a definition is that it relates salience to QUD-relevance: referents for alternatives will only be taken into account if the QUD is about them. Arguably, recency of mention is an indicator of QUD-aboutness; it is thus expected that it should have interpretive effects concerning the available set of referents for a given pronoun[8]. This has long been observed in the literature on anaphora resolution with cases like (46):

(46) a. I dropped ten marbles and found all of them, except for [one]^i. *It$_i$* is probably under the sofa.

      b. I dropped ten marbles and found only nine of them. $^?$*It* is probably under the sofa.   (Heim 1982, after Partee (p.c.))

Although the two sentences are logically equivalent in terms of contextual entailment (there is one missing marble), pronominal anaphora using *it* is infelicitous if the

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[8] Recency of mention is a way to promote salience, but not the only one. Surface order and thematic role preservation across utterances have been argued to play an even greater role in promoting salience (Terken and Hirschberg, 1994), something that could possibly explain the increased importance of parallelism in computing VP-ellipsis. See Kim and Runner 2009, 2011 for experimental data in support of this claim.

marble was not linguistically introduced as a potential referent beforehand. Ellipsis being an extreme form of anaphoric reduction of non-prosodically marked forms (Rooth, 1992a), we expect it to be highly sensitive to salience of retrievable linguistic material[9]. I thus take for granted that the *relevant* alternatives on which ellipsis is computed will only include those that are deemed relevant for the QUD in the way defined above, and that linguistic mention in a previous discourse move is a way to promote relevant alternatives.

However, recency of mention alone cannot suffice for our purposes, since it cannot explain (among other things) the lack of supersloppy readings in examples such as (53) above, or in cases like the following:

(47) A. The man I hate loves you.   (Charnavel 2019: (36))

   B. The woman I hate does not $\langle$ love $\left\{ \begin{array}{c} {}^{\#}\text{you} \\ \text{me} \end{array} \right\}$ $\rangle$ too.

(48) A. The woman you hate loves me.   (Charnavel 2019: (37))

   B. The man you hate does not $\langle$ love $\left\{ \begin{array}{c} {}^{\#}\text{me} \\ \text{you} \end{array} \right\}$ $\rangle$ too.

A successfull theory of pronominal reference under ellipsis should have something to say as to why, in those cases, the purported supersloppy readings are unavailable: after all, a discourse referent corresponding to those readings *is* introduced in the antecedent and, consequently, should become available as alternative-selected referents in the ellipsis site.

Simply put, the answer to this puzzle is provided by the information-structural status of the discourse referents at stake; more precisely, to their availability of being identified as *topics*. Following Kertz (2013), I would like to suggest that in ellipsis, the QUD-aboutness of discourse referents amounts to topicality; more precisely, that entities can be identified as QUD alternatives if they are *sentence topics*. Sentence topics can be defined as the entities the predication is about (Strawson 1964; Reinhart 1981). A more worked-out definition of topic is provided by Lambrecht (1996), which distinguishes *topics* (as discourse referents) from *topic expressions* (as the linguistic objects associated with those referents):

(49) **Topics**   (Lambrecht 1996: (4.6))
   A referent is interpreted as the topic of a proposition if in a given situation the proposition is construed as being about this referent, i.e. as expressing information which is relevant to and which increases the addressee's knowledge of this referent.

(50) **Topic expressions**   (Lambrecht 1996: (4.6))
   A constituent is a topic expression if the proposition expressed by the clause with which it is associated is pragmatically construed as being about the referent of this constituent.

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[9] Perhaps in a greater fashion than anaphora itself, as argued by Hankamer and Sag (1976) and Elbourne (2008).

Just like anaphora, ellipsis is highly sensitive to the pragmatic status of discourse referents, and the range of its possible interpretations within a string of discourse will be restricted by the information-structural status of a number of linguistic expressions, including topics and foci. However, in order to arise, ellipsis also have to be contrastive (Winkler, 2005). In VP-ellipsis, the contrast is made at the level of topics and follows the following principle put forth by Kertz (2013):

(51) **Constraint on contrastive topic relations**   (Kertz 2013: (39))
A contrastive topic relation is well formed if members of the topic set are sentence topics.

This is precisely what happens in the supersloppy case (1b), in which the two topics *I* in (1a) and *I* in (1b) are contrasted with each other; in (1A), *I* serves as the sentence topic. In B's utterance, however, the entity to whom the topic expression *I* refers to is now B. The two expressions, being realized by the same linguistic object, nevertheless denote distinct entities, that is, different topics *per* the definition in (49), satisfying the contrastive constraint.

Note that, at this stage, no other sentence topics have been introduced within the discourse model; as a consequence, the two topics consisting of our two discourse referents {A, B} can only be contrasted with each other, in order for the answer to the question *who loves whom?* to remain informative. As a consequence, in the absence of further discourse or contextual clues, both the supersloppy and the strict reading will be licensed, depending on what kind of QUD B's utterance will adress. This accounts for the fact that the number of available readings can be extended upon making new discourse referents accessible as sentence topics, as in (19) and (20):

(19) A. The handsome neighbor and I love you.

B. I do ⟨ love $\left\{ \begin{array}{c} \text{you both} \\ \text{him} \\ \text{you} \\ \text{myself} \end{array} \right\}$ ⟩ too.

(20) A. Did you know that three boys love you in the class ? Mark, Paul... and me.

B. I do ⟨ love $\left\{ \begin{array}{c} \text{Paul} \\ \text{Mark} \\ \text{you} \\ \text{all three} \\ \text{myself} \end{array} \right\}$ ⟩ too.

(52) A. { *Who loves whom ?* }
The handsome neighbor and I love you$_i$.

B. { *What about the neighbor* $\oplus A_k$ *? Who loves them$_k$?* }
I do ⟨ love you$_k$ ⟩ too.

In the above examples, the expressions *the handsome neighbor, Mark, Paul* and the indexical *I* can all be identified as topics and, as such, be contrasted with the second occurrence of *I*, triggering ellipsis with 'referential' readings for each of the topics. As we can see, the key to disambiguation of the available readings lies in which constituent is identified as being a contrastive topic, and does not rely on the lexical category of the topic, be it a pronoun or some other form of DP.

Cases such as (15) and (17) repeated below are straightforwardly accounted for in a similar fashion:

(15)   A.   He^i loves her^j.

      B.   She$_j$ does $\langle$ love $\left\{ \begin{array}{c} \text{him}_i \\ \text{herself}_j \end{array} \right\}$ $\rangle$ too.

(17)   He^i loves her^j and she$_j$ does $\langle$ love $\left\{ \begin{array}{c} \text{him}_i \\ \text{herself}_j \end{array} \right\}$ $\rangle$ too.

Again, nothing crucially hinges on indexicality here (something we will discuss further in §(6)): the availability of 'supersloppy' readings (or lack thereof) is fully predicted by the (un)availability of discourse referents as contrastive topics, which in turns predict the QUD being assessed by the speakers during the conversation.

The present story also explains the lack of supersloppy readings in examples such as (47), (48), in which the referents for indexicals *I* and *you* cannot serve as relevant discourse referents for ellipsis meaning, being non topical. In those, the indexicals in A sentences are not sentence topics, but part of relative clauses and, as such, do not satisfy the constraint in (51): as noted as early as Schachter (1973) and Kuno (1973), and emphasized by Lambrecht (1996), relative clauses are statements about their head noun. As a consequence, referents other than the one denoted by the head of the relative clause cannot be identified as topics, being somewhat 'demoted' as comments about the entity the relative clause is about.

Note that this constitutes a crucial difference between the present theory and Charnavel's 2019 e-type account: according to her theory, the lack of supersloppy readings for sentences (47) - (48) is due to the lack of a syntactic c-command relation between the indexical binder and the bindee, the *pro* variable within the ellipsis site. Although both accounts achieve the same results, the present one does so by appealing to the information-structural notions of sentence topic and pragmatic aboutness, which are independently needed in order to assess a wide range of similar phenomena across languages. Moreover, we now have a way to explain away examples such as (53) below:

(53)   A.   I hate you.   (Charnavel 2019: (46))

      B.   The handsome neighbor does $\langle$ hate $\left\{ \begin{array}{c} \text{me} \\ {}^{\#}\text{you} \end{array} \right\}$ $\rangle$ too.

In Charnavel's approach, the supersloppy reading here is blocked because, since B's answer does not feature any indexical, the relational variable R cannot find a suitable antecedent to 'feed' its contextual argument slot and bind the *pro* that the silent NP contains. This is essentially because the function INTER is indexical in nature: consequently, in the example above, *you* cannot be bound by *the handsome neighbor*, and

the strict reading is the only derivation accessible for the ellipsis site. Note that accepting such a theory for the derivation of the strict reading in (53b) amounts to assuming two different ellipsis licensing mechanisms: a standard, 'copy-and-delete' algorithm producing the strict reading as an output, and another, more complicated one treating indexicals as bound descriptions by a contextual function INTER in the supersloppy cases.

On the present take, however, things are different: what crucially differentiates examples like (53) from those such as (1), I argue, is that in the former, B's utterance introduces a new discourse referent as a sentence topic within the discourse frame, *the handsome neighbor*. Such an introduction has decisive effects on ellipsis meaning: adding a new member to the topic set restricts the range of available alternatives to those evoked by the sub-QUD *Who loves Juliet?*:

(54)   { *Who hates whom?* }

    A.   { *Who hates Juliet$_i$?* }
        I hate you$_i$.

    B.   { *Who else hates Juliet$_i$?* }
        The handsome neighbor does ⟨ hate Juliet$_i$ ⟩ too.

This is so because, in (53), *the handsome neighbor* is added within the topic set and therefore, immediately signaling a new sub-QUD created by focus-matching the topic referent against a corresponding alternative (Roberts 2012, Büring 2003). Adding a new topic forces the listener to interpret (53A) as an answer to a question about the individuals who love Juliet, rather than the less specific superquestion *who loves whom?*.

Finally, turning to (22), we see that reference to A is blocked, although he is mentioned in the antecedent, in a way reminiscent of examples (47) - (48) involving relative clauses:

(22) A. The handsome neighbor, [which I don't like very much], loves you.

    B. I do ⟨ love $\left\{ \begin{array}{c} \text{him} \\ \text{myself} \\ ^{\#}\text{you} \end{array} \right\}$ ⟩ too.

In these, the indexical *I* in A's statement is part of a non-restrictive relative clause (NRCC). Such environments have been claimed to be prototypical constructions involving non-at-issue meaning (Simons et al. 2010, Koev 2018). In our model, at-issueness can be thought of as a property of propositions that directly address the QUD ('q-at-issueness', in the sense of Koev (2018)).

(55)   **At-issueness**   (Simons et al., 2010)

    a. A proposition p is at-issue iff the speaker intends to address the QUD via $?p$.

    b. An intention to address the QUD via $?p$ is felicitous only if (i) $?p$ is relevant to the QUD, and (ii) the speaker can reasonably expect the addressee to recognize this intention.

Here, at-issueness directly relates to the ability of syntactic material to introduce sentence topics; since a NRRC like *which I don't like very much* cannot introduce sentence topics, in a way much similar to their restrictive counterparts, as a consequence they cannot be taken to address the current QUD or triggering accommodation of a new QUD (being non-at-issue). It is therefore deemed irrelevant to it and, as such, its content cannot serve as a relevant alternative to be taken into account for the computation of ellipsis meaning.

5.4 QUDs track contextual information

So far, we have seen how accessibility of discourse referents, constrained by topicality and contrast, can restrict the range of possible candidates for ellipsis meanings. But little has been said about how contextual information helps speakers and hearers alike in choosing the relevant QUD to be assessed during the conversation. As Charnavel (2019: 475) notes, contextual information plays an essential role in her own account of the data:

> The key of the present analysis is to hypothesize that discourse participants are not always directly defined by their role in the context (i.e. as the speaker or the addressee of the context), but can also be interpreted through their relation to each other in the context (the interlocutor of the speaker or addressee in the context). This possibility arises in pragmatic conditions that make this relation highly salient and relevant [...] supersloppy readings preferably obtain in situations of love, conflict, negotiation or any other type of specific interaction between the two interlocutors.

According to Charnavel, appealing to pragmatics is necessary in order to explain why supersloppy readings are strongly dispreferred for examples such as (56):

(56) *Context: Claire is talking to a neighbor.* (Charnavel 2019: 475)

    A. I came across your daughter yesterday.

    B. I did ⟨ come accross $\left\{ \begin{array}{c} \text{my} \\ ^{\#}\text{your} \end{array} \right\}$ daughter ⟩ too.

Consider another example, slightly modified from Charnavel (2019) for the sake of clarity (although the same reasoning applies to her original example (61)):

(57) A. I love my new car.

    B. I do ⟨ love $\left\{ \begin{array}{c} ^{\#}\text{my new car} \\ \text{your new car} \end{array} \right\}$ ⟩ too.

Here, the default context only establishes one potential referent for possessive *his*, namely, A:

(58) { *What about the new cars ?* }

    A. { *Who loves his$_i$ new car ?* }
       I love my$_i$ new car.

    B. { *Who else loves A's new car ?* }
       I do ⟨ love your$_i$ new car ⟩ too.

The relevant alternatives for ellipsis are the following:

(59)   ∥ C$_E$ (57B) ∥ = {x loves A's car in w | $x \in D_e, w \in D_s$}

Crucially, the above alternatives are world-dependent: they are computed against a *common ground* (a set of worlds, following Stalnaker 1974) which minimally contain the following worlds:

(60)   ⟦ CG (57) ⟧ = λw. A owns a new car in w

In (57), B's statement is taken to answer the sub-QUD *who else loves A's car ?*, given that this is common ground that there is only one new car to be discussed about. Consider now the same example uttered in a context where *both* speakers recently acquired a new car. In that context, the common ground now contains worlds in which both speakers have recently acquired cars, and B's answer can be computed against another QUD, licensing a sloppy reading:

(61)   { *What about the new cars ?* }

    A.   { *Who loves his$_i$ new car ?* }
       I love my$_i$ new car.

    B.   { *Who else loves his$_j$'s new car ?* }
       I do ⟨ love my$_j$ new car ⟩ too.

In that context, the alternatives for the E-site are different, computed against a different CG:

(62)   ∥ C$_E$ (61B) ∥ = {x loves x's car in w | $x \in D_e, w \in D_s$}

(63)   ⟦ CG (61) ⟧ = λw. A and B both own new cars in w

This point can be illustrated further with the following example, which is a slight modification of (57):

(64)   *Context: both A and the neighbor recently acquired a new car. B, however, has been dragging the same old wreck for years.*

    A.   I love my new car.

    B.   The neighbor does ⟨ love { his new car / your new car } ⟩ too.

Note that, in that case, the two readings are derived via focus-matching with different QUDs: a strict reading, where the possessive will be coreferential with A (65), and another, sloppy reading, in which the pronoun co-varies with with the car-loving-people denoting variable (66):

(65) { *What about the new cars ?* }

    A. { *Who loves his new car ?* }
       I_i love my$_i$ new car.

    B. { *Who else loves A's new car ?* }
       The neighbor does ⟨ love your$_i$ new car ⟩ too.

(66) { *What about the new cars ?* }

    A. { *Who loves his new car ?* }
       I_i love my$_i$ new car.

    B. { *Who else loves his new car ?* }
       The neighbor^j does ⟨ love his$_j$ new car ⟩ too.

An analogous example with two indexicals referring to distinct individuals in the same clause can be provided, such as in (67) below:

(67) A. I want to hire you.

    B. I do ⟨ ... ⟩ too.

Depending on the context, the ellipsis clause in (67B) can have the following meanings:

(68) a. *Context: B is applying to a job in A's company.*
       B: I do ⟨ want you to hire me ⟩ too.

    b. *Context: A and B are both renowned specialists in their field and both seek to recruit a peer for their own company.*
       B: I do ⟨ want to hire you ⟩ too.

The present account formalizes the 'pragmatic conditions' hinted at by Charnavel (2019) in the above quote: what matters in those contexts is not the salience of the relationship between the speakers, but rather, the common assumptions that they both hold true regarding the context in which the conversation is taking place. Again, appeal to the common ground is independently motivated for both theoretical and empirical purposes, and suffices to explain the restriction on alternatives upon which ellipsis relies.

6   Is the problem specific to indexicals ?

So far, our proposal has set aside one of the central issues raised by indexical pronouns in CCE, namely, the fact that elided indexicals seem to be able to retrieve their reference from two different contexts, depending on the reading in the ellipsis clause. This, however, is a mere decoy; one of the central features of the setup advocated for here is that the problem disappears, altogether with the assumption that ellipsis is a structure-copying mechanism.

The apparent problem with examples like (1) is that the two utterances are produced by two different speakers in two different kaplanian contexts (*k*-contexts for

short). Since the function of contexts is that of fixing the semantic values of indexicals before they enter semantic composition, its meaning cannot 'backtrack' in the course of the derivation and refer to the same parameter of another context. In other words, if the meaning of *I* when uttered by Juliet in context c_b is the individual denoted by the name *Juliet*, then the speaker parameter $sp(c_b)$ is fixed for the entire utterance, and cannot be used to refer to some utter individual in *that* context. But this is precisely what happens when the elided indexical is interpreted 'sloppily', regardless as to how many speakers they are, as illustrated in (16) repeated here:

(16) I^i love you^j and you$_j$ do ⟨ love $\left\{ \begin{array}{c} me_i \\ yourself_j \end{array} \right\}$ ⟩ too.

Now, contexts are different across utterances, but it is not necessarily a problem for ellipsis. In fact, it is only a problem for identity theories that posit a copying algorithm that operates on syntactic and/or semantic structure, such as those of Williams (1977), Fiengo and May (1994) or Merchant (2001) i.a. In the present model, however, ellipsis is licensed indirectly, *via* the QUD, and does not presuppose any copying algorythm specific to ellipsis: rather, ellipsis is viewed as an extreme form of anaphoric destressing that is mainly sensitive to information structure and contextual cues. A direct consequence of this view is that we need not assume that elided indexicals are copied directly from the antecedent into the ellipsis site, but simply that what licenses the different readings depends on the discourse status of their referents, more precisely on their availability to be identified as topics.

Such a view follows the spirit, although not the letter, of an early proposal by Sag and Hankamer (1984), in which they propose that ellipsis operates directly on discourse referents at LF. As a matter of fact, Sag and Hankamer raise the problem of cross-clausal indexicals and propose that VP-ellipsis operates not at the level of *characters*, but at the level of *contents*[10]. Their theory makes crucial use of what they call *alphabetic variants*, which they define as follows:

(69) **Alphabetic variants**   (Sag and Hankamer 1984: 329)
      Two expressions are alphabetic variants if they are identical down to variable indices and they do not contain distinct free variables.

Sag and Hankamer (1984) propose that a VP can be deleted "if its logical translation is an alphabetic variant of some expression in the logical translation of the surrounding discourse"; reference to alphabetic variants of an expression (i.e., variables that happen to have the same reference) allows them to explain examples of CCE that are very similar to those that concern us here:

(70) A. Do you think they'll like me ?   ((Partee, 1975))

      B. Of course they will ⟨ like $\left\{ \begin{array}{c} you \\ {}^{\#}me \end{array} \right\}$ ⟩.

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[10] An analogous proposal is made by Percus (2013).

(71) A. Are you coming over here ? (Sag and Hankamer 1984: (18))

B. Yes, I am ⟨ coming over $\left\{ \begin{array}{c} \text{there} \\ ^{\#}\text{here} \end{array} \right\}$ ⟩.

In order to account for such examples, Sag and Hankamer (1984) propose the following licensing algorithm for ellipsis containing indexicals:

(72) Delete VP$_b$ in sentence S_b only if

a. c_b is the k-context of S_b

b. c_a is the k-context of some sentence S_a not subsequent to S_b in discourse

c. There is some VP$_a$ in S_a s.t. $\forall t. \forall w. \forall g. [\llbracket VP_b \rrbracket^{c_b,w,t,g} = \llbracket VP_a \rrbracket^{c_a,w,t,g}]$

This condition stipulates that deletion can occur iff the k-contexts of the antecedent and the ellipsis site share the same referential values with respect to their parameters, and under identity of intensional parameters. In other words, cross-clausal ellipsis is licensed if the k-contexts involved share the same world, the same time, and the same location (something that is left out in the above generalization), and under identity of referential indices. As in the present theory, what matters here is not the status of linguistic expressions *qua* linguistic objects, but that of their *reference*, i.e. the discourse referents they serve to identify: it thus does not matter for ellipsis whether two referents are identified under the same 'guise' or a different one (e.g., with the same indexical but uttered by two different speakers), since they will be treated as 'alphabetic variants' denoting the same referent.

Extending this proposal to (1), we note that the meaning of I in B's k-context is

(73) $\llbracket$ I $\rrbracket^{c_b}$ = Juliet

Therefore, c_a and c_b minimally differ as to the value of their *speaker* parameter. But since $c_a(t,w,l) = c_b(t,w,l)$, contexts are assumed to be intensionally uniform.

Note that, since *sp* and *ad* are not discourse referents themselves but rather, functions from communicative roles to such referents (or *characters* in the sense of Kaplan 1989), we have, for each k-context, two parameters at play (*speaker* and *addressee*, respectively), but only two out of four available referents for these parameters: A and B. Assuming that the intensional parameters values of our k-contexts are those in (1), and that *sp(c_a)* = Romeo and *sp(c_b)* = Juliet, then the set of available discourse referents is {Romeo, Juliet}, and the possible candidate meanings for B's answer are the following:

(74) a. $\llbracket (1)\text{A.} \rrbracket^{g,c} = love'[ad(c_a), sp(c_a)] = love'(Juliet, Romeo)$
      'The speaker of the utterance context c_a loves his addressee in that context'.

b. $\llbracket (1)\text{B. 'supersloppy'} \rrbracket^{g,c} = love'[ad(c_b), sp(c_b)] = love'(Romeo, Juliet)$
      'The speaker of the utterance context c_b loves her addressee in that context'.

c. $\llbracket (1)\text{B. 'strict'} \rrbracket^{g,c} = love'[ad(c_a), sp(c_b)] = love'(Juliet, Juliet)$
      'The speaker of the utterance context c_b loves the addressee of the utterance context c_a'

Note that the strict reading is equivalent to

(75) $[\![(1)B.\ \text{'strict'}]\!]^{g,c} = love'[sp(c_b), sp(c_b)] = love'(Juliet, Juliet)$
      'The speaker of the utterance context c_b loves herself in that context'.

As it turns out, nothing is wrong with the value assumed by the indexical in the ellipsis site, in that its reference is established using the set of parameters of a single context, c_b, not two. Adopting Sag and Hankamer (1984) terminology, $ad(c_a)$ and $sp(c_b)$ are alphabetic variants of the same referent, Juliet.

7   The role of the additive particle *too*

In our canonical example (1), B's answer cannot be felicitously uttered if the E-site is not followed by the additive particle *too*:

(1) A. I love you.

     B. I do ⟨ love $\left\{ \begin{array}{c} \text{you} \\ \text{myself} \end{array} \right\}$ ⟩ $^{\#}$(too).

I will argue here that this must not be overlooked as a mere side effect of ellipsis; rather, the contribution of *too* is essential in such contexts.

Consider the examples below: when subjects are distinct across clauses, *too* is obligatory, and both readings become available, as in (17) repeated here. However, in (76), the presence of *too* is infelicitous, and the E-site only delivers a strict reading.[11]

(15) A. He^i loves her^j.

      B. She$_j$ does ⟨ love $\left\{ \begin{array}{c} \text{him}_i \\ \text{herself}_j \end{array} \right\}$ ⟩ $^{\#}$(too).

(76) A. He^i loves her^j.

      B. He$_i$ does ⟨ love her$_j$ ⟩ $^{\#}$too.

In order to explain this contrast, let me assume, following i.a. Krifka (1998) and Saebo (2004), that the role of additive particles such as *too* and *again* is to introduce alternatives to the proposition they associate with, by presupposing that the context provides a contrastive alternative to the sentence the additive occurs in, and that this proposition is true. I adopt the following semantics for *too*:

(77) **Semantics of *too***   (Saebo 2004: 202)
      Assuming that *T(p)* is a partial function assigning to *p* its accented topic *T(p)*,
      $[\![\ \text{too}\ ]\!] = \lambda p : p[\exists \alpha \mid p[T(p)/\alpha]]$

This definition states that the meaning of *too* is the proposition it attaches to with the presupposition that there exists an alternative α such that *p* holds under the substitution of α for *T(p)*. In other words, *too* comes with the presupposition that the context

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[11] Literature on the obligatoriness/optionality of *too* in VP-ellipsis structures is surprisingly scarce. A notable exception is Bos (1994).

must provide a suitable candidate α that can replace the contrastive topic of p and still be part of the relevant alternatives in the utterance context.

An important part of this definition is that *too* associates with topics that are *contrastive*, i.e. topics that presuppose the existence of alternatives for which information is required. In our model, a contrastive topic is an element that will answer an implicit QUD that is a sub-question of the question being discussed. Contrastive topics will thus force hearers to accommodate an implicit sub-QUD within the discourse model, as explained in §5.

So, additives particle such as *too* associate with topics. But more importantly, as Saebo (2004) notes after Krifka (1998), assertion of a topic T triggers a distinctive contrastive implicature, from which the hearer understands that no alternatives hold for the asserted topic:

(78) **Contrastive implicature** (Saebo 2004: 204)
For any ϕ and C s.t. $T(\phi)$ is defined and there are alternatives α to $T(\phi)$ active in C, then for all such α, ϕ implicates $\neg\phi[T(\phi)/\alpha]$ in C.

The contrastive implicature can be viewed as an instance of quantity implicature (Grice, 1975): if, upon uttering $T(\phi)$, the speaker also believed that $T(\alpha)$ was the case, he should have uttered $T(\phi) \wedge T(\alpha)$ in order to satisfy the first maxim of quantity and be maximally informative; if he didn't, the hearer can then reasonably infer that $\neg\phi[T(\phi)/\alpha]$ in C. Assertion of *too*, by contrast, allows speakers to cancel this implicature, in presupposing that one alternative to the associate (topic) is true.

With that in mind, we can now assess the differences between (1)-(15) and (76). Consider the latter first: in order to license the presence of *too*, B's answer has to be *contrastive* with some previous contextual antecedent. But here, the EC provides no such contrast: it is identical to the antecedent, the subject *he* being interpreted as co-referential with the subject of the antecedent. As a consequence, ellipsis is licensed, but assertion of *too* isn't, and the contrastive implicature triggered by A's assertion is not cancelled.

Now, compare this to (15) or (1): here, ellipsis is licensed under the conditions that we stated above in the same fashion, but since the two subjects are distinct, the presence of *too* indicates distinctiveness: there is at least one alternative of the proposition p that *too* associates with that is true in context C, since the use of *too* cancels the contrastive implicature that negates these alternatives in C. Hence, both readings in (**??**) are licensed.

This was the final piece needed to solve our puzzle. Recall from last section that, since the meaning of indexicals is computed through what Kaplan (1989) calls their character (a function from context to contents/meanings), their reference change from context to context. This is true in our (1), where c_a differs from c_b in (at least) their *speaker* and *addressee* parameters. However, as we showed in the last section, although the characters of *I* and *you* in those contexts provide us with four different *contents* ($sp(c_a)$, $ad(c_a)$, $sp(c_b)$, $ad(c_b)$, respectively), their reference only involves two individuals: A and B, who assume distinct discourse roles across sentences. This has a major consequence for our examples: since, in order to license a sloppy reading, additive *too* has to be added (and its presupposition satisfied), we expect to observe the inverse pattern in examples such as (76) where, in contraposition to its indexical counterpart (1), reference for 3rd person pronouns remains constant across clauses. As it turns out,

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the prediction is borne out: in (79), B's answer is infelicitous without the presence of *too*, while the reverse holds for (80).

(79)   A. I^i love you^j.

      B. I_j do $\langle$ love $\left\{ \begin{array}{c} \text{you}_i \\ \text{myself}_j \end{array} \right\} \rangle$ $^{\#}$(too).

(80)   A. I^i love you^j.

      B.   You$_i$ do $\langle$ love $\left\{ \begin{array}{c} ^{\#}\text{yourself}_i \\ \text{me}_j \end{array} \right\} \rangle$ ($^{\#}$too).

Again, this follows naturally from the semantics and pragmatics of additive *too* discussed above: in (79), the mere use of the same indexical in B's answer suffices to license a contrast and hence, the presence of *too*: the presupposition associated with it is satisfied (there is an available, salient alternative for B in *C* - A's utterance) and the implicature conveyed by A is effectively cancelled. The same is not true for (80), where *you* and *I* refer to the *same* individuals across sentences, and contrast does not obtain: as a consequence, the use of *too* is infelicitous in that context, since there is no available contrastive alternative proposition in *C*.

8   Conclusion

In this paper, I have tried to provide a pragmatic account of indexicals under ellipsis, appealing to a theory that allows ellipsis sites to establish their reference anaphorically, through the computation of alternatives viewed as congruent answers to a mutually shared question under discussion. I have shown that the referential constraints operating on elided pronouns can be stated in terms of their ability (or lack thereof) to select sentence topics as referents, and that, to this respect, indexicals under ellipsis do not differ from their 3rd person counterparts. Finally, I have tried to highlight the role of the additive particle *too* in restricting the available readings associated with those referents.

The present account does not refute the e-type account of indexicals adopted by Charnavel (2019), although it undermines some aspects of it. For instance, the present system is able to explain supersloppy readings without appealing to a distinct category of e-type indexicals: rather, our theory makes use of well-established and independently needed information-structural and pragmatic notions such as topicality, question under discussion and stalnakerian common ground. Likewise, the present account does not force us to renounce Kaplan's two-dimensional system for indexicals, since nothing in the current proposal assumes covert indexicals being copied within the ellipsis site. Moreover, the present take on ellipsis obviates the need of positing a covert *INTER* relation present in the syntax, while allowing us to highlight the similarities existing between ambiguities in pronoun reference and those in ellipsis resolution (as studied extensively in Poppels (2020) and Miller (2020), for instance), paving the way to a general theory of anaphora as called for by Sag and Hankamer (1984).

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