Sometimes I Sit and Think [CP], and Sometimes I Just Think So: A Cross-linguistic Overview of Embedded Polarity Particles

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Contents

Abstract

Cushing (1972) and Sailor (2012) both propose that the polarity item *so* in sentences such as *I think so* is a sentential proform. According to Sailor, if *so* is a CP, thus in complementary distribution with the complementizer *that*, this would explain the impossibility of **I think that so*. However, it is difficult to see how this proposal can be generalized crosslinguistically; a similar proposal cannot entirely explain the German pattern in (1), where *schon* 'so' and the complementizer *dass* 'that' co-occur.

(1)   Ich denke (schon), dass er recht hat.
      I   think so,   that he right has
      'I think that he's right.'

It is also uncertain what Sailor's and Cushing's proposals have to say about languages that require an overt complementizer with embedded polarity particles, such as in Czech:

(2)   Myslím, *(že)   ano/ne.
      I.think, *(that) yes/no
      'I think so/not.'

Languages that pattern like Czech include at least Spanish, Catalan, Russian, Hebrew (Sailor 2012), French, Polish, and Romanian (Authier 2013). Interestingly, these languages have no separate word for *so* and *not*; they can embed *yes* and *no* unlike in Germanic languages. Sailor explicitly rejects an ellipsis analysis of *so* and *not* in the style of Kramer and Rawlins (2009), who argue *yes* and *no* are always followed by a TP, whether pronounced or elided. His opinion on the status of *yes* and *no* as proforms in English and crosslinguistically, however, remains unclear.

Assuming the analysis of *yes* and *no* as laid out in Kramer and Rawlins (2009) and Holmberg (2012), I propose that this analysis extends to embedded polarity particles. Specifically, I argue that ellipsis after *yes*, *no*, *so*, and *not* is sluicing, a form of ellipsis where a TP is elided after a focused element (e.g., *Beatrice ate something, but I don't know what$_i$ [$_{TP}$ Beatrice ate t$_i$]*). Showing that polarity particles and focused elements such as wh-phrases are in complementary distribution (e.g., **Yes who did John see?*), I argue that *yes*, *no*, *so*, and *not* occupy the specifier of a focus position as described in Rizzi (1997). I also provide data from Hungarian, Romanian, and various Slavic languages where *yes* and *no* appear to occur in a structural position where focused elements typically appear. As noted in van Craenenbroeck and Lipták (2013), Czech, for example, licenses sluicing after the complementizer *že* 'that' and a non-wh focused element, fully parallel to the example in (2).

Finally, I adapt the missing antecedent test from Grinder and Postal (1971), Hankamer and Sag (1976), and Authier (2011) that shows differences in behavior between ellipsis and proforms. For example, in the sentence *John didn't cut Bertha with a knife; Bill did (*that), and it was rusty*, only VP ellipsis (*did*) and not a proform (*did that*) can make the antecedent of *it* comprehensible. Similarly, *I think so* can provide an antecedent as well; e.g., *Jason doesn't think John met anyone; (*I think so), and she just might be The One.* Surveying Germanic, Romance, and Slavic languages with this test, I conclude that all of these languages employ ellipsis after polarity particles, whether or not the language in question has a separate set of lexical items for embedded contexts as in English and German.

1 Introduction and Proposal

An interesting property of Germanic languages is their use of two sets of words to answer yes/no questions. In addition to the matrix answers *yes* and *no* in English or *ja* 'yes' and *nein* 'no' in German, there exist special polarity items specifically for embedded contexts:

(1) a.   I think (*that) **so/not**.
     b. *I think (that) **yes/no**.   *English*

(2) a.   Ich denke (*dass) **schon/nicht**.
          I   think (*that) so/not.
          'I think so/not.'

     b. *Ich denke, dass **ja/nein**.
          I   think, that yes/no.
          Intended: 'I think so/not.'   *German*

This contrasts with the use of matrix particles, demonstrated in (3–4).

(3) Is that your second bottle of wine?
     a.   Yes. / No.
     b. *So. / *Not.

(4) Ist das deine zweite Flasche Wein?
     Is that your second bottle   wine
     'Is that your second bottle of wine?'
     a.   Ja. / Nein.
          yes / no
          'Yes. / No.'
     b. *Schon. / *Nicht.
          So.   / Not.
          'So. / Not.'

Sailor (2012), in line with Cushing (1972), proposes that English *so* is a finite-CP proform in these contexts, hence its inability to co-occur with an overt complementizer. What is unclear, however, is how a proform account could be generalized cross-linguistically. For example, many Romance and Slavic languages have no separate word for *so*; in these languages, the words corresponding to *yes* and *no* can be embedded under predicates like

think, unlike in Germanic languages. Moreover, these languages' polarity particles co-occur with an overt complementizer equivalent to English *that*.

(5) Je crois   *(que) **oui/non**.
    I   believe *(that) yes/no
    'I think so/not.'   *Romance: French*

(6) Myslím, *(že)   **ano/ne**.
    I.think, *(that) yes/no
    'I think so/not.'   *Slavic: Czech*

As Sailor notes, the same meaning can be expressed similarly in at least Spanish, Catalan, Russian, Hebrew. Additionally, Authier (2013) gives matching data from Polish and Romanian. Hungarian and Greek also have phonologically identical matrix and embedded polarity items, but the use of a complementizer is optional.

(7) Gondolom, (hogy) **igen/nem**.
    I.think,   that   yes/no
    'I think so/not.'   *Hungarian* (Ildiko Szabo p.c.)

(8) Nomizo (pos) **ne/oxi**.
    I.think that yes/no
    'I think so/not.'   *Greek* (Maria Kouneli p.c.)

However, although Sailor rejects an ellipsis analysis of *so* in the style of Kramer and Rawlins (2009), his opinion on the status of *yes* and *no* in English and crosslinguistically remains unclear. That is, he does not say whether *yes* and *no* are also proforms of a similar kind.

Furthermore, although the German *schon* seems to have the same distribution as English *so*, they are not completely identical. Specifically, proposing that they are both finite-CP proforms is not sufficient to explain the fact that German *schon* but not English *so* can be followed by an overt CP.
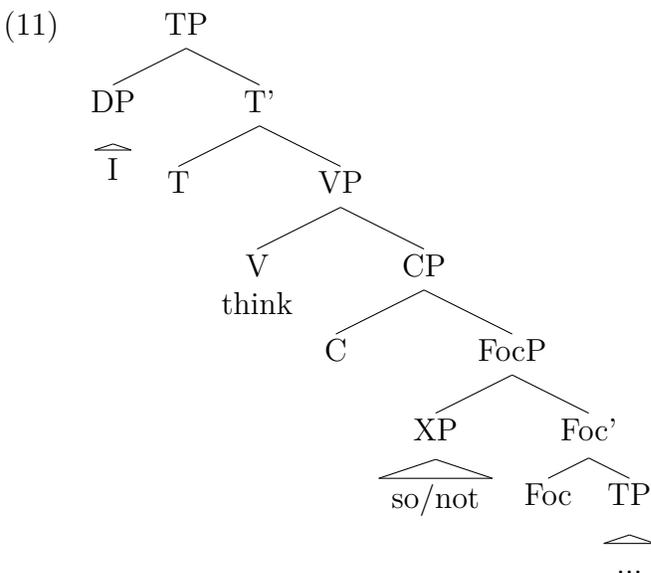
(9)   * I think so (that) black tea is better with milk and sugar.

(10)   Ich denke schon, dass der Aufschrei berechtigt ist.
     I   think so,   that the outcry   justified   is
     'I do think that the outcry is justified.'   (Hatting 2012)

Just as Sailor (2012) argues that analyzing *so* as a CP proform would predict its inability to co-occur with the complementizer *that*, his analysis also predicts that *so* should be incompatible with another CP or TP. Though this holds for English, it cannot be said of German *schon*.

It is clear that Sailor's and Cushing's proposals cannot be extended to other languages. To resolve this, I adopt an ellipsis analysis of matrix *yes* and *no* as laid out in Kramer and Rawlins (2009) and Holmberg (2013), where these polarity items are always accompanied by the TP they affirm or deny, regardless of whether this TP is elided or not. In line with parallels observed between *yes* and *I think so* in Kramer and Rawlins (2010), I will extend this analysis to embedded *so* and *not*.

Building on Kramer and Rawlins and Laka (1990)'s argument that affirmation and negation are in complementary distribution, Holmberg proposes that polarity should be viewed as a variable with two possible values: affirmative and negative. Yes/no questions, on the other hand, have open polarity; in these cases, Holmberg proposes that the polarity particles *yes* and *no* are operators serving to bind the variable polarity. Implicit in this proposal is his placement of these operators in the specifier of a focus projection FocP, a detail left largely undiscussed.

Extending Holmberg's proposal on the status of *yes* and *no*, I propose that the embedded polarity particles *so* and *not* (along with German *schon* and *nicht*) occupy a structural focus position such as the specifier of FocP originally proposed in Rizzi (1997). A simple syntactic tree of my analysis of *I think so/not* is shown below in (11)

(11)

```
                    TP
              ┌──────┴──────┐
            DP              T'
            │           ┌───┴────┐
            I           T        VP
                              ┌───┴────┐
                              V        CP
                            think  ┌────┴────┐
                                   C        FocP
                                        ┌─────┴─────┐
                                       XP          Foc'
                                     so/not      ┌──┴──┐
                                               Foc    TP
                                                      ...
```

This proposal thus likens polarity particles to other focused elements, in particular wh-phrases. Additionally, this particular position for polarity particles suggests that any TP ellipsis that follows should be considered sluicing, a form of TP ellipsis occurring after focused elements, most commonly wh-phrases.

I begin by reviewing the proposals of Kramer and Rawlins (2009) and Holmberg (2013), arguing that a focus account of matrix as well as embedded polarity particles can account for the core insights made in each paper. Despite the fact that each proposal undergenerates with respect to certain relative polarity constructions captured by Farkas and Roelofson (2013)'s feature analysis of the polarity particles *yes* and *no*, I argue that an ellipsis account retains certain theoretical advantages over a purely semantic or pragmatic analysis.

I then begin to evaluate several predictions of a theory that categorizes polarity particles as focused elements and ellipsis after polarity particles as sluicing. First, I examine the complementary distribution of polarity particles with other focused elements. I also present data from Hungarian, Romanian, and various Slavic languages, all languages that have more productive focusing of non-wh elements, that suggest structural similarities between wh-phrases and other focused elements and polarity items.

Finally, I present independent syntactic evidence for ellipsis after the embedded polarity particles *so* and *not* to argue against a proform account of these particles. I use two tests
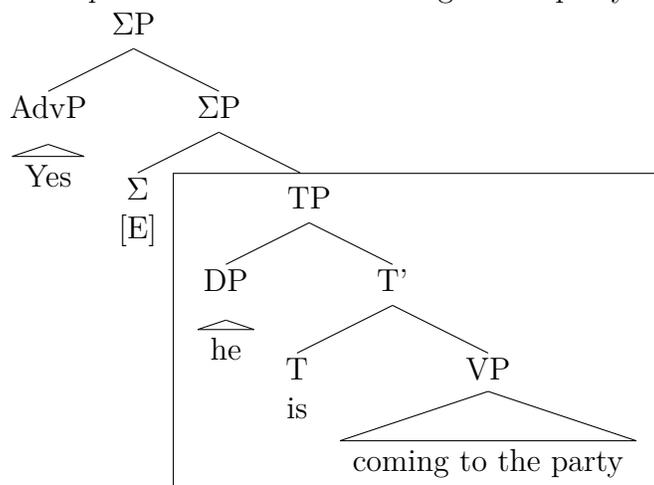
to show that *I think so* patterns with other instances of ellipsis: like VP ellipsis, *I think so* is able to license otherwise unavailable antecedents as well as innovative idiomatic readings. Based on this evidence, I argue that an ellipsis proposal of embedded *so* and *not*, not just in Germanic but cross-linguistically, has distinct empirical advantages to an account such as Sailor's, which does not include ellipsis.

2 Background

2.1 Kramer and Rawlins (2009)

Kramer and Rawlins (2009) adopt a syntactic projection specifically for polarity, called ΣP and originally proposed by Laka (1990). This projection, argued to merge between T and C in the derivation, is argued to host negation and emphatic affirmation in a single projection (but, importantly, not at the same time; Laka notes these features are in complementary distribution). Different linguists have used a ΣP (or a PolarityP, abbreviated to PolP) to serve different purposes; Kramer and Rawlins say that the Σ head hosts the [E] feature from Merchant (2004), which triggers ellipsis of the complement (in this case, the TP complement to Σ). Under their analysis, *yes* and *no* are adverbial adjuncts to this ΣP. An example of their analysis of an affirmative answer, taken from Kramer and Rawlins (2009:4), is shown in (12) below. Note that the TP may be elided; I will represent this by placing a box around the elided material.

(12)   *In response to* Is Alfonso coming to the party?

```
                      ΣP
              ┌────────┴────────┐
            AdvP              ΣP
             │          ┌──────┴──────┐
            Yes         Σ          ┌──────────────────────────┐
                       [E]         │            TP            │
                                   │      ┌──────┴──────┐     │
                                   │     DP           T'      │
                                   │      │       ┌────┴────┐ │
                                   │     he       T        VP │
                                   │              is  ┌─────┴──────┐
                                   │               coming to the party
                                   └──────────────────────────┘
```

Their analysis of negative responses is slightly more complicated and involves a negative concord chain between the higher Σ and the lower Neg head. This involves a series of [Neg] features, of which exactly one is interpretable; it is precisely this one that carries the negative weight of the utterance.

(13)   *In response to* Is Alfonso not coming to the party?

```
                      ΣP
              ┌────────┴────────┐
            AdvP              ΣP
             │          ┌──────┴──────┐
            No           Σ         ┌──────────────────────────────────┐
                    [uNeg, E]      │              TP                   │
                                   │        ┌──────┴──────┐           │
                                   │       DP           T'            │
                                   │        │       ┌────┴────┐       │
                                   │       he       T        NegP     │
                                   │                is   ┌─────┴─────┐ │
                                   │                    Neg         VP │
                                   │                   [iNeg]  ┌────┴────┐
                                   │                        coming to the party
                                   └──────────────────────────────────┘
```
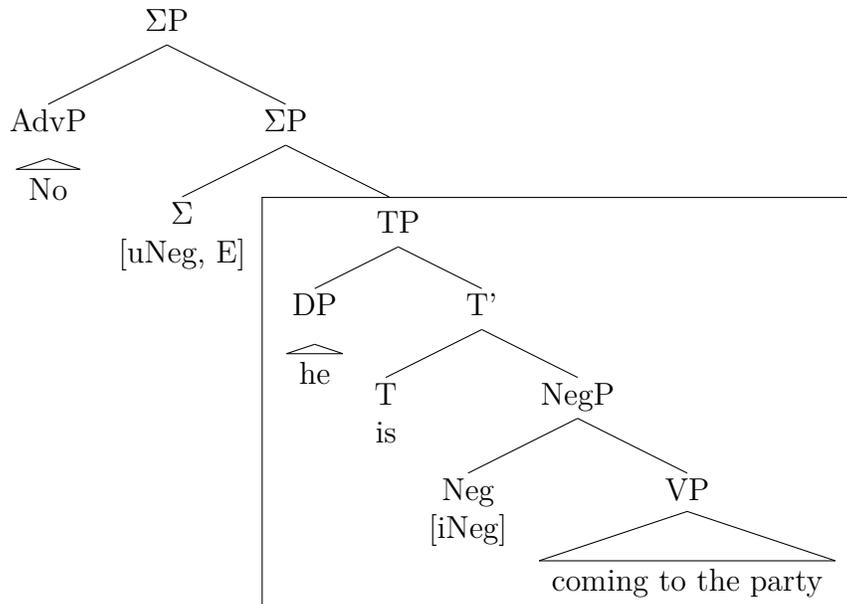
In the case of a negative answer to a negative question, the interpretable feature is found within the TP. Following Merchant (2004)'s description of the [E] feature, a phrase that gets elided must be semantically identical (but, importantly, not necessarily syntactically identical) to a phrase already in the discourse. Merchant defines this semantic identity as

E-givenness (i.e., when the two phrases entail each other). Because the TP in the question has no interpretable negative feature, the elided TP cannot have this feature, either. Under Kramer and Rawlins' analysis, negative answers to negative questions, however, host the interpretable negative feature on Neg° instead of Σ°, since the TP of the question also contains this feature.

Kramer and Rawlins prefer an ellipsis account of *yes* and *no* because their analysis of polar particles predicts a phenomenon called negative neutralization, where the meanings of *yes* and *no* converge. Consider the following paradigm.
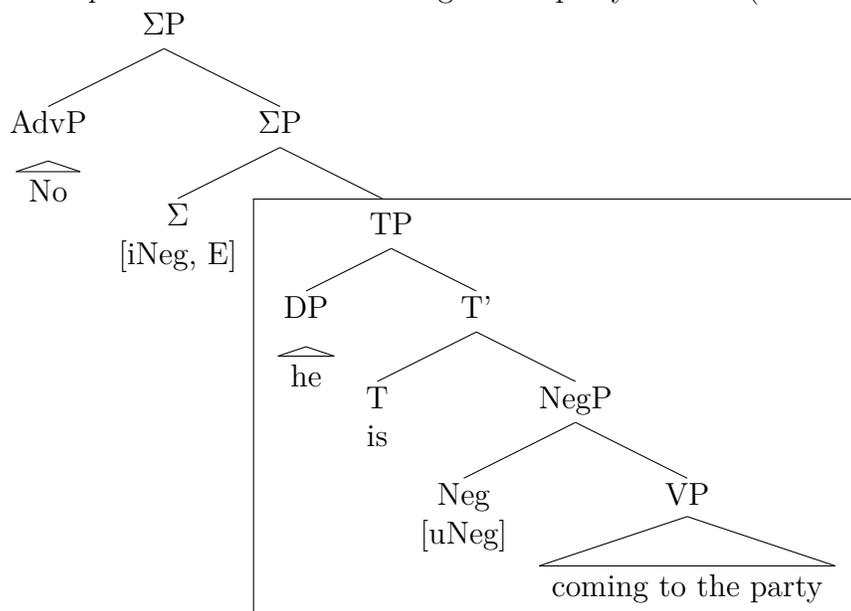
(14)   *In response to* Is Alfonso not coming to the party?   (Kramer and Rawlins 2009:2)
    a.   % Yes. (= Yes, he's not coming to the party.)
    b.   No. (= No, he's not coming to the party.)

Note that there is some interspeaker variation with regards to the acceptability of (14a). Those speakers who do not accept (14a) (of which I am one) find it impossible to process; it is unclear whether the speaker is agreeing that Alfonso is not coming to the party, or if they are submitting that Alfonso is indeed coming.

For the speakers that accept (14a), however, the bare *yes* unambiguously confirms the negation of the question. Given the assumption that the elided TP must semantically match the TP of the question, which contains an interpretable negative feature, the negative meaning of *yes* (for the relevant speakers) in this context is rather unsurprising.

However, under this theory, a negative answer to a positive question cannot have an interpretable negative feature, seeing as the question's TP has no interpretable negative feature. Kramer and Rawlins resolve this issue by hosting the [iNeg] feature on Σ°; the lower Neg° has an uninterpretable negative feature that participates in the negative concord chain. The following, then, is equivalent to (13), except for the placement of the interpretable versus uninterpretable features.

(15) *In response to* Is Alfonso coming to the party?   (Kramer and Rawlins 2009:5)

```
                    ΣP
          ┌──────────┴──────────┐
        AdvP                    ΣP
         │            ┌──────────┴──────────┐
        ⏜             Σ          ┌──────────────────────────┐
         No        [iNeg, E]     │         TP               │
                                 │   ┌──────┴──────┐        │
                                 │  DP            T'        │
                                 │   ⏜      ┌──────┴──────┐ │
                                 │  he      T           NegP │
                                 │          is      ┌──────┴──────┐
                                 │                 Neg          VP  │
                                 │                [uNeg]      ┌──┴──┐│
                                 │                        coming to the party │
                                 └────────────────────────────────┘
```

In the case of a negative answer to a positive question, the interpretable negative feature is found on Σ°. Importantly, it cannot be located on the Neg° head due to the semantic identity requirement of Merchant's [E] feature.

Kramer and Rawlins argue for an ellipsis account because with ellipsis they are able to generalize over many cases of negative neutralization, which has also been observed to occur with adverbs like *maybe*, for example, as shown below in (16).

(16) *In response to* Did Alfonso not go to the party?   (Kramer and Rawlins 2009:7)
    a. Maybe (so). (= Maybe he didn't go to the party.)
    b. Maybe not. (= Maybe he didn't go to the party.)

Additionally, the data in (17) demonstrate that the meaning of the embedded polarity particles *so* and *not* also converges in the right context.

(17) *In response to* Is Joanna not going to the party?   (Kramer and Rawlins 2010:6)
    a. I think so. (= I think she isn't.)
    b. I think not. (= I think she isn't.)
    c. I don't think so. (= I think she isn't.)

Without an ellipsis account, a theory of syntax must handle (14–17) individually, missing the chance to generalize over many cases of similar behavior. Importantly, the matrix

particles *yes* and *no* behave the same as the embedded particles *so* and *not*, providing evidence for a unified account of both types of particles. Kramer and Rawlins argue that ellipsis also helps to account for the fact that the meaning is not always derived from what is pronounced but from the contents of the elided TP. My proposal that TP ellipsis after polarity particles is sluicing can account for the advantages of this past proposal while being able to accommodate new data, which I will present later in sections 2 and 3.

2.2   Farkas and Roelofson (2013)

I would like to turn to discuss the difference between absolute and relative polarity, a factor that complicates Kramer and Rawlins' theory of feature valuation. Farkas and Roelofson (2013), in line with Pope (1976), Farkas and Bruce (2010), and Farkas (2010), argue that an analysis of polarity features must take into account not just absolute polarity (which Kramer and Rawlins address) but also relative polarity. They argue that a Pol° head (equivalent to Kramer and Rawlins' Σ°) hosts the absolute features [+] and [–] and the relative features [AGREE] and [REVERSE].

Under Farkas and Roelofson's analysis, the absolute polarity features require that the TP complement of Pol° have a certain polarity: positive in the case of [+] and negative in the case of [–]. On the other hand, relative polarity features require that the polarity of the utterance either match or refute the polarity of a previous utterance (whether a question or an assertion). Whereas the relative feature [AGREE] requires the prejacent's polarity to be the same as a previously uttered TP, the feature [REVERSE] requires the new TP to have the opposite polarity of an antecedent TP. Farkas and Roelofson argue that *yes*, in addition to being the realization of [+], can also be the realization of [AGREE]. Likewise, *no* can be the realization of [–] or [REVERSE]. This analysis is able to predict the data in (18).

(18)   [AGREE, +]   (Farkas and Roelofson 2013:389)
       Peter called. / Did Peter call?
       a.   Yes, he did.
       b.   * No, he did.

Because the TP of the response is positive, Pol° must have a [+] feature. Additionally, because this positive polarity matches the positive polarity of the preceding utterance, (18) demonstrates the relative feature [AGREE]. Farkas and Roelofson argue that *yes* is licensed in (18a) because it can express both [+] and [AGREE], but (18b) is ungrammatical because *no* expresses only the features [–] and [REVERSE].

Similarly, in [REVERSE, –] contexts, only the polarity particle *no* is accepted.

(19)   [REVERSE, –]   (Farkas and Roelofson 2013:389)
       Peter didn't call. / Did Peter not call?
       a.   * Yes, he didn't.
       b.   No, he didn't.

In (19), the prejacent TP has negative polarity and refutes the positive polarity of the previous utterance; thus, (19) demonstrates the features [–] and [REVERSE]. Only *no* can realize these features, and so (19b) is grammatical. *Yes*, however, can be the realization only of the features [+] and [AGREE]. Because the TP of (19a) demonstrates neither of these features, it is ungrammatical.

Unlike in (18–19), instances of the feature combinations [AGREE, –] and [REVERSE, +] are able to license both *yes* and *no*. Note that these are the two types of contexts that respond to negative assertions and questions.

(20)   [AGREE, –]   (Farkas and Roelofson 2013:389)
       Peter didn't call. / Did Peter not call?
       a. Yes, he didn't.
       b. No, he didn't.

(21)   [REVERSE, +]
       Peter didn't call. / Did Peter not call?
       a. Yes, he did.
       b. No, he did.

Under the analysis of Farkas and Roelofson, the [AGREE] feature of (20) and the [+] feature of (21) license a response introduced by *yes*, as shown in (20a) and (21a). At the same time, (20)'s [–] feature and (21)'s [REVERSE] are able to license the *no* in (20b) and (21b).

In any case, it is clear that more features than simply [Neg], as well as a positive counterpart [+] (although Kramer and Rawlins do not specify a feature specifically for positive polarity) are necessary to account for all of the complexities not just in English but also cross-linguistically. In other languages, it is possible for the polarity particles to only be able to express the absolute features [+] and [–] or the relative features [AGREE] and [REVERSE]. For example, a bare Spanish *sí* 'yes' in response to a negative question cannot express relative agreement but only absolute positive polarity.

(22) ¿No viste   la   nueva película?
      NEG saw.2SG the new   movie
      'Haven't you seen the new movie?' / 'Have you not seen the new movie?'
      a.   Sí.
            yes
            'Yes, I have.'
      b. * Sí,   no   la vi.
            yes, NEG it I.saw
            Intended: 'Yes, I haven't.'   (Julen Zalacain Ancín p.c.)

Unlike English *yes*, Spanish *sí* seems to only be able to express an absolute [+] feature rather than a relative [AGREE] feature. In contrast, Cantonese polarity particles only express relative features, not absolute features. This system is called a truth-based answering system or an agreement/disagreement system as opposed to the polarity-based system of Spanish (Holmberg 2013). Consider the following set of answers to a negative question in Cantonese.

(23) keoi-dei   m   jam   gaafe?
      he/she-PL NEG drink coffee
      'Do they not drink coffee?'   (Holmberg 2013:32)
      a. hai.
          yes
          'Yes, they don't drink coffee.'[1]
      b. m   hai.
          NEG yes
          'No, they do drink coffee.'

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[1]Holmberg (2013:32) notes that *hai* is phonologically identical to the copula, and can thus alternatively be glossed as such.

Here we see that, in response to a negative question, the particle corresponding to English *yes* can only have an agreeing, negative interpretation. When negated, however, this particle can only contradict the TP of the question; this leads to a positive answer to a negative question. In the terms of Farkas and Roelofson, Cantonese particles express the relative polarity features [AGREE] and [REVERSE] as opposed to absolute polarity.

Kramer and Rawlins (2009) accounts for both positive and negative answers to positive questions; in other words, they can account for cases of [AGREE, +] and [REVERSE, –]. However, Farkas and Roelofson argue that their proposal cannot entirely account for the data presented in (20–21). Because Kramer and Rawlins propose that *no* triggers a negative concord chain with exactly one interpretable negative feature, they predict that *no* is incompatible with a positive TP. However, they note that *no* is attested with positive TPs, as in the following example.

(24) *In response to* Did Alfonso not go to the party? (Kramer and Rawlins 2009:9)
    a.   No, he DID go.
    b. # No. (Intended meaning: No, he DID go.)

Kramer and Rawlins argue that this *no* is "not actually a negative *no*" (2009:9); rather, it is a (positive) reversal particle such as German *doch* or French *si*, shown below in (25–26). Note, however, that a bare *no* as in (24b) cannot express Farkas and Roelofson's [REVERSE] feature; its only interpretation is negative agreement (i.e., [AGREE, –]).

(25)   (Farkas and Roelofson 2013:308-309)
    A. Claude est à la maison.
        Claude is   at the house
        'Claude is at home.'
    B. Oui/*Non/*Si, elle y   est.
        Yes/*No/*SI,   she there is
        'Yes, she is.'

(26) A. Claude n'est   pas à la maison.
        Claude NEG'is NEG at the house
        'Claude isn't at home.'
    B. Si/*Non/*Oui, elle y   est.
        SI/*No/*Yes,   she there is

'Yes, she is.'

The French particle *si* can only be used in response to negative assertions and questions such as (26), whereas the particle *oui* is only licensed in response to positive assertions and questions, as in (25). Kramer and Rawlins offer a possible account of the differences between English and French by saying that while French has a separate lexical entry for a reversal feature (which, they argue, introduces an uninterpretable [uRev] feature that "forces an interpretable reversing feature into the clause"), the English reversal feature is realized by a particular stress on T° (in the case of (24a), this would be stress on *did*). Kramer and Rawlins suggest that perhaps (24b) cannot be interpreted as reversal *no* because under TP ellipsis there is nowhere for the intonational stress to surface.

In Farkas and Roelofson (2013)'s semantic account of absolute and relative polarity, they note that although they adopt an ellipsis account of English polarity particles *yes* and *no*, it is not strictly necessary for their feature analysis. However, even adjusting Kramer and Rawlins' feature proposals to be in line with Farkas and Roelofson, an important insight into negative neutralization is missed. The existence of the relative polarity features [AGREE] and [REVERSE] alone cannot explain why a bare *no* in (27b) can only express absolute negative polarity, whereas *no* accompanied by a positive TP, as in (27a), can express positive disagreement.

(27)   *In response to* Did Alfonso not go to the party?   (Kramer and Rawlins 2009:9)
    a.   No, he DID go.
    b. # No. (Intended meaning: No, he DID go.)

Furthermore, it would be unclear why a bare *yes* responding to a negative question can only be interpreted as expressing the relative [AGREE] feature and not the absolute [+] feature. With an overt TP, however, *yes* can express absolute polarity, as in (28).

(28)   *In response to* Is Alfonso not coming to the party?
    a. % (=14a) Yes. (= Yes, he's not coming to the party.)
    b.   Yes, he is.

An ellipsis account as detailed in Kramer and Rawlins (2009) is able to predict the difference in interpretation between (28a) and (28b). Under Merchant's semantic identity requirement, the negative feature in the question must reappear in the elided TP in (28a). Thus, *yes* in this case cannot be a realization of Farkas and Roelofson's [+] feature, but instead must be a realization of [AGREE], as the question and answer agree in (negative) polarity.

As for (28b), no TP ellipsis is present; instead, we see VP ellipsis. Assuming that the polarity features are hosted outside of the VP, a semantic identity requirement does not impose any of these features onto the elided phrase. The *yes* in (28b), but not (28a), is free to be a realization of the absolute [+] feature rather than the relative [AGREE] feature, as long as the following TP is specified for positive polarity.
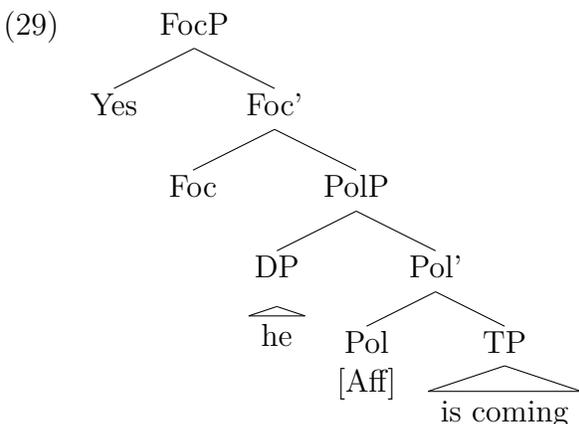
Overall, despite the complications posed in Farkas and Roelofson (2013), I argue that the ellipsis account from Kramer and Rawlins (2009) still has theoretical and empirical advantages over a proform account, particularly when it comes to certain asymmetries between bare polarity particles and polarity particles accompanied by an overt TP.

2.3   Holmberg (2013)

Holmberg (2013) builds on the ellipsis account laid out in Kramer and Rawlins (2009), but deviates from it in some rather significant ways. In particular, Holmberg's treatment of features is very different. He argues that *yes* and *no* are operators that can bind a variable "open polarity" internal to the TP. His proposed structure is given in (29).[2,3]

---

[2]Holmberg's PolP is equivalent to Kramer and Rawlins' ΣP.

[3]I set aside Holmberg's placement of the subject *he* in Spec,PolP, rather than in Spec,TP, but I do not adopt this part of his analysis.

(29)

```
              FocP
             /    \
          Yes      Foc'
                  /    \
               Foc      PolP
                       /    \
                     DP      Pol'
                     |      /    \
                     he   Pol     TP
                        [Aff]    /  \
                              is coming
```

Interestingly, Holmberg rejects Merchant (2001)'s semantic identity requirement, instead arguing that elided phrases must be syntactically identical to some constituent previously in the discourse. His requirement for ellipsis is that elided constituents must "have a salient antecedent which is identical at LF up to assignment of values to variables" (Holmberg 2013:37). Holmberg clarifies that by "identical at LF" he means that the elided phrase and its antecedent must be syntactically equivalent.

Because *yes* and *no* are operators that must bind a variable, Holmberg rules out the combination of polarity particles *yes* and *no* with a TP already valued for polarity. He argues that this requirement rules out instances where bare *yes* comes in response to a negative question such as in (30). Consider the following set of replies.

(30)   *In response to* Is John not coming?   (Holmberg 2013:39)
       a.   # Yes.
       b.   Yes he is.

Because the TP of the question is already specified to have negative polarity, there is no variable for *yes* to bind. In the case of VP ellipsis, however, the polarity can be unspecified since it does not need to be identical at LF to the polarity of the question.

As Farkas and Roelofson (2013) point out, however, this view of polarity predicts that we would never see *yes* in conjunction with a negative TP (that is, a *yes* that confirms the negation of the previous question or assertion). They argue that the following grammatical exchange is wrongly predicted to be ungrammatical under Holmberg's account.

(31)   (Farkas and Roelofson 2013:409)
    A. You cannot not go to church and call yourself a good Christian.
    B. Yes, you cannot do that.

As with Kramer and Rawlins' account of polarity particles, it is clear that a complete and unified account of all languages' polarity particles must make use of relative polarity in addition to absolute polarity. Nevertheless, with an ellipsis account of *yes* and *no*, Holmberg is still able to make insights that a purely feature-based semantic analysis of *yes* and *no* would overlook.

Both he and Kramer and Rawlins (2009) investigate the difference between questions with clitic negation *n't* and unreduced *not*. As the reduced form *n't* must undergo movement with the auxiliary outside of the TP, Kramer and Rawlins refer to this form of negation as outer negation, whereas they call the *not* that must remain within the TP inner negation. Interestingly, negative neutralization only holds with inner negation.
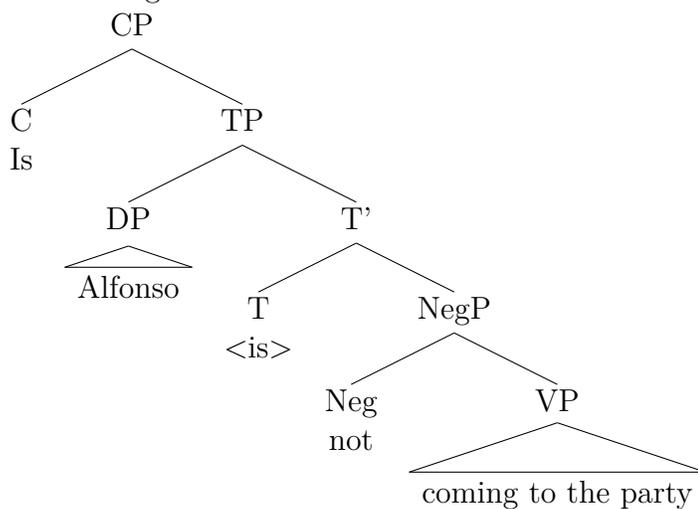
(32) *In response to* Isn't Alfonso coming to the party?   (Kramer and Rawlins 2009:6)
    a.   Yes. (= Yes, he is coming.)
    b.   No. (= No, he isn't coming.)

(33)   (Kramer and Rawlins 2009:2)
    (=14) *In response to* Is Alfonso not coming to the party?
    a. % Yes. (*can only mean* Yes, he isn't coming.)
    b.   No. (= No, he isn't coming.)

Kramer and Rawlins argue that negative neutralization is not attested with (32) because there is no negation within the TP. It's the TP-internal negation in (33), which must remain in a responding elided TP, that causes the negative neutralization. When the elided TP must be semantically identical to (32), which has no negation, *yes* and *no* act the same as they do in response to a positive question.
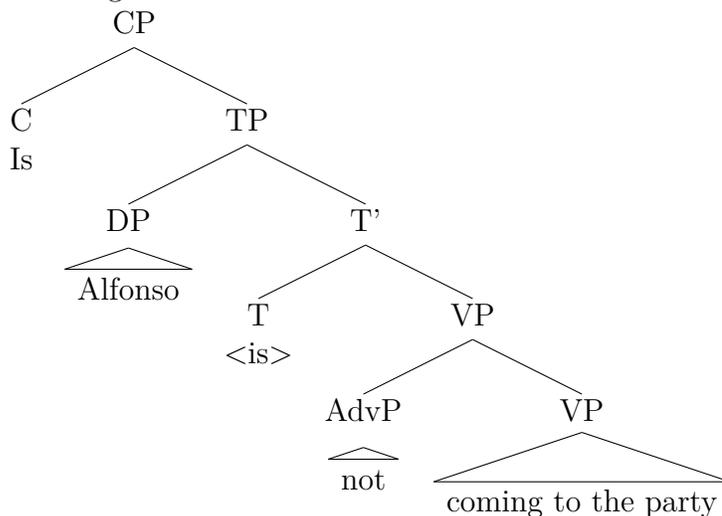
Holmberg (2013) introduces a third level of negation to this paradigm. Referring to Kramer and Rawlins' outer negation as highest negation, he argues that the question in (33) is ambiguous between what he calls middle negation and low negation. Although middle negation is pronounced within the TP (presumably in Neg°), it takes scope over the TP.

On the other hand, low negation is a form of constituent negation taking scope over the VP; syntactically, Holmberg treats this as a VP adjunct. Thus, (33) has the following two possible analyses in (34–35).

(34)   Middle negation

```
                      CP
              ┌───────┴───────┐
              C               TP
              Is       ┌───────┴───────┐
                       DP              T'
                      ╱──╲       ┌──────┴──────┐
                     Alfonso     T            NegP
                                <is>      ┌─────┴─────┐
                                          Neg         VP
                                          not       ╱────╲
                                               coming to the party
```

(35)   Low negation

```
                      CP
              ┌───────┴───────┐
              C               TP
              Is       ┌───────┴───────┐
                       DP              T'
                      ╱──╲       ┌──────┴──────┐
                     Alfonso     T            VP
                                <is>     ┌─────┴─────┐
                                        AdvP         VP
                                        ╱─╲        ╱────╲
                                        not   coming to the party
```

Holmberg notes that the addition of certain adverbs disambiguates the type of negation; in particular, adding an adverb before *not* forces a low negation reading. He reports that *yes* and *no* display distinct behavior in response to questions containing low negation. Importantly, negative neutralization is not observed in the following data.

(36)   *In response to* Does John sometimes not show up for work?   Holmberg (2013:39)
    a.   Yes. (= Yes, John does sometimes not show up for work.)
    b.   ? No.

Holmberg reports that a bare *no* is hard to process in this case, but that it can only mean *No, John doesn't sometimes not show up for work* or, alternatively, *John always shows up for work.*

Since the low negation (a reading forced by the preceding adverb) is only a VP adjunct, its negative meaning is kept, but *yes* and *no* are still able to bind the polarity of the TP. Whereas (36a) receives a negative interpretation because of the constituent negation, (36b) contains both sentential negation and constituent negation, leading to an overall positive interpretation. Holmberg suggests that this type of double negation is the reason (36b) is degraded in comparison to (36a) and harder to process. Importantly, though, the meanings of (36a) and (36b) do not converge as in the instances of negative neutralization observed by Kramer and Rawlins.

If the adverb is pronounced after *not* instead, a middle negation (Kramer and Rawlins' inner negation) reading is forced. In this case we see negative neutralization once more.

(37)   *In response to* Does John not sometimes show up for work?
    a. % Yes. (*can only mean* Yes, sometimes John doesn't show up for work.)
    b.   No. (= No, sometimes John doesn't show up for work.)

Given the syntactic analysis of middle negation *not* as the head of NegP and the analysis of low constituent negation as a VP adjunct, an ellipsis account predicts the paradigms seen above, where negative neutralization occurs with middle but not low negation.

Although Farkas and Roelofson (2013) claim to be able to explain (36) when taking into account the scope of negation (with middle negation scoping over the TP and low negation scoping over the VP only), I argue that their purely semantic account still fails to capture the differences between bare polarity particles and those with an accompanying TP.

(38)   *In response to* Does John sometimes not show up for work?
    a. ? No. (*can only mean* No, John doesn't sometimes not show up for work.)
    b.   No, he does. (same meaning as 38a)
    c.   No, sometimes he doesn't. (= Sometimes he doesn't show up for work.)

Importantly, although *no* with an overt TP can carry several meanings (38b and 38c mean opposite things), the bare *no* in (38a) can only have one of these meanings. A complete theory of these polarity particles must be able to explain this difference in availability of readings between bare *no* and *no* with a TP. Since Holmberg's ellipsis account of *yes* and *no* is able to predict the data in (38), I argue that even though Holmberg (2013)'s proposal fails to account for some pieces of Farkas and Roelofson (2013)'s proposal, it is still necessary to adopt an ellipsis analysis to explain the distribution of bare polarity particles.

3   Polarity particles in Spec,FocP

Having reviewed different proposals arguing for TP ellipsis after the matrix particles *yes* and *no*, I now return to my proposal that the embedded *so* and *not*, in addition to matrix *yes* and *no*, occupy a structural focus position. This proposal makes several strong predictions that I will investigate, including the prediction that TP ellipsis following polarity particles is a form of sluicing. In this section I argue that polarity particles are in complementary distribution with other focused elements, and I present data from various languages that suggests strong syntactic parallels between embedded focused phrases and embedded polarity particles.

3.1   *Yes* and *no* unavailable in wh-questions

If polar particles such as yes and no are located in the specifier of a focus phrase, one would expect them to be in complementary distribution with other focused elements. Wh-phrases, which have been argued in Rizzi (1997) to be incompatible with focused elements, should likewise be incompatible with *yes* and *no*. This prediction is borne out in the English data in (39).

(39)   *Yes/no* + wh-phrase *who*
    a. Who did John see?
    b. *Yes who did John see?

    c. *No who didn't John see?

    d. *Who yes did John see?

    e. *Who no didn't John see?

The sentences in (39) are ungrammatical; it is impossible to even determine whether yes and no would come before or after the wh-phrase, should this type of construction be allowed, since each sentence above is as sharply ungrammatical as the next.

3.2 Incompatibility of polarity items and answers to wh-questions

Just as wh-phrases occupy Spec,FocP in wh-questions, fragment answers to wh-questions also occupy this position. Thus, they are also predicted to be incompatible with *yes* and *no* despite having been observed to co-occur. Consider the following exchange, where speaker B answers not only the explicit yes/no question of speaker A, but also the implicit wh-question (namely, *Who did you see?*).

(40)   A. Did you see someone?

       B. Yes, our neighbor.

I take these facts to be similar to Authier (2013)'s analysis of answers to yes/no questions where *yes* or *no* is paired with a TP that does not appear in the question. Such an answer is demonstrated below in (41b), alongside a more "typical" answer in (41a).

(41)   *In response to* Is our neighbor home?

      a. Yes, [$_{TP}$ our neighbor is home].

      b. Yes, [$_{TP}$ I saw her car in the driveway].

The grammaticality of responses such as (41b) could pose a problem for Kramer and Rawlins' and Holmberg's analyses of *yes* and *no*, which are obligatorily followed by the TP of the preceding question. This TP may or may not be elided, resulting in the fragment answers *Yes* and *No* in cases of TP ellipsis. The TP following *yes* in (41b), however, does not match what was in the preceding question. If the TP in (41b) stands in the same structural relation to *yes* as the TP in (41a), Kramer and Rawlins' and Holmberg's proposals cannot be correct.

Authier argues that despite the surface similarities between direct answers such as (41a) and indirect answers such as (41b), they actually have different structures. Importantly, there is still an elided TP in (41b) that matches that of the original question, appearing under *yes*. Thus, sentence (41b) would have the following underlying structure, where the crossed-out TP is not pronounced.

(42)   Yes [~~TP our neighbor is home~~], [TP I saw her car in the driveway].

I would like to adopt this analysis, applying it to the exchange in (40). I argue that an elided TP remains in (40B), and that the fragment answer *our neighbor* constitutes a separate syntactic tree. Consider the following possible answers to the question repeated from (40).

(43)   *In response to* Did you see someone?
       a. Yes, I did.
       b. Yes, our neighbor.
       c. Our neighbor, yes.
       d. Yes, I did, our neighbor.
       e. * Yes, our neighbor, I did.

Answers (43a–43c) show that it is possible to answer the explicit question with a pronounced TP or the implicit question with a fragment answer. When only *yes* and *our neighbor* appear, they can occur in either order, but when both answers are combined, yielding (43d), note that they can only occur in one order: (43e) is markedly worse than (43d).

Recall that under my analysis, the only difference between (43b) and (43d) is that in (43b), but not (43d), the TP is elided. I'd like to argue that these sentences have the same structure, as depicted below, but the TP is only elided in (43b). I analyze *our neighbor* as the specifier of a focus position with an elided complement in a separate syntactic tree, following Merchant (2004).

(44)

       a. (=43b) Yes, [~~TP I did see someone~~], [FocP our neighbor [Foc' ...]].

b. (=43d) Yes, [$_{TP}$ I did [$_{VP}$ see someone]], [$_{FocP}$ our neighbor [$_{Foc'}$ ...]].

As for (43e), however, I posit that there must be an elided TP beneath *yes* that matches the TP of the question, as Holmberg proposes for sentences such as (42). The full structure of (43e), then, has two identical TPs:

(45)   (=43e) Yes [$_{TP}$ I did see someone], [$_{FocP}$ our neighbor [$_{Foc'}$ ...]], [$_{TP}$ I did [$_{VP}$ see someone]].

The sharp redundancy and markedness of (43e), I believe, can be explained by this repetition of TPs, even if only one is pronounced. Under an analysis where *yes*, *I did*, and *our neighbor* are all part of the same syntactic tree, it would be puzzling why *our neighbor* cannot intervene between *yes* and *I did* despite the relatively free order of the other elements. I argue that *yes* and the wh-answer *our neighbor* occupy the same structural position, Spec,FocP, but that in answers such as (43b–43d), they are in two distinct trees, answering two separate questions, and thus do not constitute counterexamples to my original proposal.

3.3   Wh-phrases unavailable in yes/no questions

Just as *yes* and *no* are ungrammatical in wh-questions, English strongly disallows wh-phrases in yes/no questions except in echo contexts.

(46)   Wh-phrase *who* in a simple yes/no question
    a. # Did you see who?
    b. # Did who see you?

(46a) and (46b) are only grammatical in echo questions, where what is being questioned is not the polarity of the statement, but what another speaker has just uttered. *Yes* and *no* are both unacceptable and unintelligible answers to these questions. Rather, the speaker expects clarification of a past utterance. I will not offer an analysis of such echo questions here, but I would like to distinguish them from yes/no questions.

3.4   Distribution of embedded focus positions

In various languages, in addition to wh-phrases and *yes* and *no* being in complementary distribution in matrix questions, they appear to surface in the same position in embedded contexts. For example, in Hungarian, a language that allows an overt complementizer with embedded wh-phrases, a sentence such as (47) is grammatical.

(47)   Nem emlékszem, (hogy) kivel   [$_{TP}$találkoztak a   gyerekek].
       NEG I.remember, (that) who.with [met.3PL   the children]
       'I don't remember who [the kids met with].'   (Merchant 2001: 116)

Embedded under the predicate *remember*, a complementizer (when overt) precedes the wh-phrase, followed by a TP that may be optionally sluiced. This wh-phrase appears in a structural focus position, which in Hungarian is immediately before the inflected verb (Puskás 2000), presumably in Spec,FocP. Similarly, when *igen* 'yes' and *nem* 'no' are embedded in Hungarian, they follow an optional complementizer, as shown in (48).

(48)   Gondolom, (hogy) igen/nem [$_{TP}$ ...].
       I.think,   that   yes/no.
       'I think so/not.' (=7)

Assuming Holmberg (2013)'s analysis where bare *yes* and *no* are followed by an elided TP, (48) is then fully parallel to (47), whose embedded TP may be elided. This parallel suggests that (48), like (47), is an instance of sluicing, where ellipsis follows *igen* or *nem*. Importantly, in proposing that (48) is a case of sluicing, I am proposing that *igen* and *nem*, like the wh-phrase *kivel* in (47), are located in Spec,FocP.

Slavic languages also show surface similarities between focused items and polarity items. As documented in van Craenenbroeck & Lipták (2013), for example, languages such as Czech allow sluicing after non-wh focused phrases, exemplified in (49).

(49)   Věděl jsem, že   Honza někoho   pozval, ale nevěděl   jsem, že
       knew 1SG, that Honza someone.ACC invited, but NEG.knew 1SG, that
       Martina.
       Martin.ACC

'I knew that Honza invited someone, but I didn't know it was Martin.'   (van Craenenbroeck & Lipták 2013: 11)

This structure, which is also attested in Polish, Russian, Serbo-Croatian, and Romanian (van Craenenbroeck & Lipták 2013), consists of a non-wh focused phrase *Martina* pronounced directly after a required complementizer.

The same predicate *vědět* 'to know,' in addition to licensing a focus sluice, has the ability to embed the polarity items *ano* 'yes' and *no* 'ne,' as shown in the example below:

(50)   „To   víte,   že **ne**," odpověděla   s   nádechem prostořekosti.
          „DEM know.2PL, that **no**," answered.3SG.FEM with touch.INS flippancy.GEN
          "You know that's not true," she answered with a touch of flippancy.
          (Kleypas 2012: 101)

Just as the focused element *Martina* in (49), *ne* directly follows an obligatory complementizer. If (49) and (50) are both cases of sluicing, which I am arguing is the case, this would predict that the elements following Spec,FocP are elided. van Craenenbroeck and Lipták (2013) analyze (49) as having an elided TP following the focused element, parallel to a wh-sluicing environment. They report the focused phrase here to be the accusative form of the masculine name *Martin* and not the nominative form of the feminine name *Martina*, which are homophonous. The overt accusative case marking on *Martina*, assigned from the elided predicate *pozvat* 'to invite,' provides evidence for this ellipsis. Additionally, Holmberg's (2012) analysis of polarity items suggests that even in embedded contexts, words corresponding to English *yes* and *no* always have an accompanying TP, which may or may not be elided. All together, these similarities suggest that the focused element in (49) and *ne* in (50) occupy the same syntactic position, namely, Spec,FocP.

3.5   Multiple variables and ambiguous sluicing

Holmberg (2013)'s argument for the treatment of polarity as a variable (including the open polarity in yes/no questions) lends itself easily to a sluicing analysis of the polarity particles *yes*, *no*, *so*, and *not* cross-linguistically. Sluicing that involves wh-phrases must

always link back to a variable, for example an indefinite quantifier such as *someone*. I hereby submit that polarity ellipsis must likewise refer to an open polarity already in the discourse, in line with a typical analysis of wh-sluicing. Consider the following few sentences, where the italicized focused element (which immediately precedes TP ellipsis) refers back to the bolded variable in the preceding clause:

(51)   a. My roommate is dating **someone**, but I don't know *who*.
        b. I wonder **if the new Pokémon game will be innovative**; I hope *so*.

In (51a), the wh-phrase refers back to the bolded indefinite quantifier *someone*, and in (51b), the embedded polarity particle *so* refers back to the CP headed by *if*. Since the TP *the Pokémon game will be innovative* is not entailed by (51b), being headed by *if* rather than *that*, uttering (51b) does not submit either that the new Pokémon game will be innovative nor that it will not be innovative. This, I propose, is a form of open polarity as described by Holmberg (2013).

When multiple variables are present, a sluice can refer to any of these variables. Consider the following ambiguous sluice, where the wh-phrase *who* can refer to either of two indefinite expressions; the two possible readings of the sluice are disambiguated below.

(52)   **Someone at the office** sent **a coworker** a love letter, but I don't know who.
        a. ..., but I don't know who sent a coworker a love letter.
        b. ..., but I don't know who someone at the office sent a love letter.

Because there are two indefinite DPs, *someone at the office* and *a coworker*, the sluice can link to either indefinite, leading to the ambiguity. A proposal that classifies polar ellipsis as sluicing would predict that ellipsis after polarity particles can be similarly ambiguous, given the existence of multiple open polarities. An ambiguous polarity sluice is exemplified in (53), where the sluice can latch either onto the matrix open polarity of *might* or onto the open polarity embedded under the non-factive predicate *suspect*. Its two readings are paraphrased beneath.

(53)   Hannah **might suspect** Annalise is the murderer, but I don't think so.

    a. ..., but I don't think that Hannah might suspect Annalise is the murderer.

    b. ..., but I don't think that Annalise is the murderer.

When the matrix clause contains a modal and a non-factive predicate such as *suspect*, *so* can refer to the matrix polarity or embedded polarity, paraphrased in the readings of (53a–b). Importantly, neither the prejacent of the modal nor the clause embedded under a non-factive is entailed by (53). In other words, the utterance of (53) does not commit the speaker to a confirmation or denial of the content of either example in (53). This ambiguity is parallel to the multiple readings found in (52), which arises in the presence of more than one indefinite DP.

In contrast, however, without the modal *might* or with a factive predicate like *know*, the entailments of the sentence change and there are fewer cases of open polarity, restricting the available readings as there are fewer variables the sluice can refer to.

(54) Hannah **suspects** Annalise is the murderer, but I don't think so.
    a. # ..., but I don't think that Hannah might suspect Annalise is the murderer.
    b.   ..., but I don't think that Annalise is the murderer.

(55) Hannah **might** know that Annalise is the murderer, but I don't think so.
    a.   ..., but I don't think that Hannah might know Annalise is the murderer.
    b. # ..., but I don't think that Annalise is the murderer.

(56)   * Hannah knows that Annalise is the murderer, but I don't think so.

Removing cases of open polarity one at a time reduces the available readings by one as well (elements triggering open polarity are represented in bold in 54–55). When both the modal and the non-factive predicate are removed as in (56), the sentence becomes ungrammatical. A multiple-variable sluice of wh-phrases has the same behavior when its variables are removed one at a time.

(57)   My colleague at the office sent **a coworker** a love letter, but I don't know who.
    a. # ..., but I don't know who sent a coworker a love letter.
    b.   ..., but I don't know who my colleague at the office sent a love letter.

(58)   **Someone at the office** sent my coworker a love letter, but I don't know who.
    a.   ..., but I don't know who sent my coworker a love letter.

b. # ..., but I don't know who someone at the office sent a love letter.

(59) * My colleague at the office sent my coworker a love letter, but I don't know who.

A theory unifying ellipsis after *yes*/*no* and sluicing is able to predict the observations made above, including the possibility for polar ellipsis to be ambiguous. Importantly, this prediction hinges on the treatment of polarity as a variable in line with, for example, indefinite DPs.

4   Evidence for ellipsis

4.1   Connectivity effects with *yes* and *no*

Connectivity effects with polarity particles have been attested, as in Wambeek Dutch, where a subject clitic may attach to *jui* 'yes' even when there is no accompanying TP.

(60)   A.   Kom   ze   mergen?
        comes she tomorrow
        'Is she coming tomorrow?'
    B.   Jui-**s**,   (ze   kom   mergen).
        Yes-she.CL, (she comes tomorrow)
        'Yes, (she is coming tomorrow).'   (van Craenenbroeck 2004: 153)

The presence of the clitic -*s* even without an accompanying TP provides evidence for ellipsis after the polarity particle because the form of the clitic depends on the contents of the elided TP. In other words, an ellipsis account is preferable to a purely semantic or pragmatic account of the polarity particle because under an analysis of bare *juis* where no ellipsis occurs, there would be no explanation for the origin of the subject clitic -*s*.

4.2   Licensing of missing antecedents: ellipsis vs. proforms

Having considered an array of arguments for the status of polar particles *yes*, *no*, *so*, and *not* as focused phrases, I would like to now turn to investigate independent evidence

that suggests an ellipsis account of embedded polarity particles is necessary. A rather productive test that has revealed sharp differences in behavior between proforms and ellipsis is the missing antecedent test developed for English in Grinder and Postal (1971), Bresnan (1971), and Hankamer and Sag (1976), as well as adapted to identify French null complement anaphora in Authier (2011). This test relies on the observation that indefinite DPs under the scope of negation cannot serve as antecedents for pronouns in later clauses, as in (61a). This contrasts with indefinites in positive contexts, such as in (61b), which is fully acceptable.

(61)   a.   * Harry doesn't have a wife$_i$ and she$_i$ is a nag.   (Grinder and Postal 1971:276)
       b.   Harry has a wife$_i$, and she$_i$ is a nag.

Grinder and Postal (1971) and Bresnan (1971) note that DPs can act as antecedents even when they are elided. Despite the fact that the only overt indefinite DP below in (62a) is under the scope of negation, the pronoun *it* in the later clause still finds an antecedent. Interestingly, Bresnan contrasts VP ellipsis with the proform *do it*, which cannot license antecedents.

(62)   (Bresnan 1971:591)
       a.   Jack didn't cut Betty with a knife but Bill did [ ], and it was rusty.
              (*it* = the knife Bill cut Betty with)
       b.   * Jack didn't cut Betty with a knife – Bill did it, and it was rusty.
              (*it* = the knife Bill cut Betty with)

Notably, only the VP ellipsis in (62a) and not the verbal proform *did it* in (62b) is able to provide an antecedent for the later pronoun. Bresnan uses this contrast to argue that only (62a) is derived via some process of syntactic deletion from a sentence containing a second indefinite DP, in this case *a knife*. Abstracting away from the exact mechanics of ellipsis, the acceptability of (62a), as opposed to the ungrammaticality of (62b), can be explained by this second (silent) indefinite DP, which can act as an antecedent since it is not under the scope of negation. Under an approach to ellipsis where elided material is syntactically present but phonologically null (or deleted at PF), I will argue that there is an elided DP *a knife* only

in example (62a). The VP proform *do it*, however, has no elided internal structure, and is thus unable to provide the relevant antecedent.

This test can be extended to instances of not just VP, but also TP ellipsis, demonstrated in (63).

(63) a. Jordan thinks Jamie met someone$_i$, and they$_i$ just might be The One.
      b. * Jordan doesn't think Jamie met anyone$_i$, and they$_i$ just might be The One.
      c. Jordan doesn't think Jamie met anyone$_i$; **I think so**, and they$_i$ just might be The One.

The indefinite *someone* in (63a), a sentence without negation, can license an antecedent for singular *they*. However, (63b)'s *anyone*, an indefinite in a negative context, cannot provide a salient antecedent for *they*. Parallel to (61a) above, the sentence crashes. Moving to (63c), the addition of *I think so* suddenly improves the sentence; it patterns with the VP ellipsis in (62a) but not *do it* in (62b). The fact that *I think so* allows an antecedent suggests there is an elided DP embedded below *think*, presumably *someone*. Importantly, this elided DP is not in a negative context like the overt *anyone*, which is blocked from becoming an antecedent.

This pattern holds in many other languages, including Spanish, French, German, and Czech. The behavior of *I think so* patterning with ellipsis cuts across typological boundaries, regardless of whether or not the matrix and embedded particles are identical and whether or not a complementizer must be present. It is also worth noting that French and German, which always require overt subjects, pattern with Spanish and Czech, languages that make use of little *pro*. The paradigms for each language are laid out below in (64–70)[4].

(64) a. Juan cortó a   Pablo con tijeras$_i$,   y   estaban$_i$ afiladas.
          Juan cut ACC Pablo with scissors.FEM.PL, and were.3PL sharp.FEM.PL
          'Juan cut Pablo with scissors$_i$, and they$_i$ were sharp.'
      b. Josephine a   coupé Marie avec un couteau$_i$,   et il$_i$ était
          Josephine has cut   Marie with a   knife.MASC, and 3SG.MASC was
          rouillé.
          sharp.MASC
          'Josephine cut Marie with a knife$_i$, and it$_i$ was sharp.'

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[4]Many thanks to Lourdes Dávila, Mila Hall, and Štěpán Skalský for their judgments and patience that allowed me to gather these complete paradigms.

    c.   Ingo hat Hans mit der Schere$_i$ geschnitten, und sie$_i$ war scharf.
        Ingo has Hans with the scissors.FEM.SG cut.PART,   and it   was sharp.

        'Ingo cut Hans with the scissors, and they were sharp.'

    d.   Honza řízl Lucii   nůžkami$_i$, a byly$_i$ ostré.
        Honza cut Lucie.ACC scissors.INS, and they.were sharp.

        'Honza cut Lucie with scissors, and they were sharp.'

In (64) above, we see an indefinite in a positive context that is accessible to pronouns (and little *pro*) in a later clause.

(65)   a. * Juan no   cortó a   Pablo con tijeras,   y   estaban
           Juan NEG cut   ACC Pablo with scissors.FEM.PL, and were.3PL
           afiladas.
           sharp.FEM.PL

           'Juan didn't cut Pablo with scissors$_i$, and they$_i$ were sharp.'

    b. * Josephine n'a   pas coupé Marie avec un couteau$_i$,   et   il$_i$
           Josephine NEG'has NEG cut   Marie with a   knife.MASC, and 3SG.MASC
           était rouillé.
           was sharp.MASC

           'Josephine didn't cut Marie with a knife$_i$, and it$_i$ was sharp.'

    c. * Ingo hat Hans mit der Schere$_i$ nicht geschnitten, und sie$_i$ war
           Ingo has Hans with the scissors.FEM.SG NEG cut.PART,   and it   was
           scharf.
           sharp.

           'Ingo didn't cut Hans with the scissors, and they were sharp.'

    d. * Honza Lucii   nůžkami$_i$ neřízl,   a byly$_i$ ostré.
           Honza Lucie.ACC scissors.INS NEG.cut, and they.were sharp.

           'Honza didn't cut Lucie with scissors, and they were sharp.'

The positive sentences in (64) contrast with the ungrammatical negative sentences in (65), which differ only in the presence of negation.

(66)   a.   Juan no   cortó a   Pablo con tijeras;   **fue   Eduardo**, y
           Juan NEG cut   ACC Pablo with scissors.FEM.PL; it.was Eduardo,   and
           estaban   afiladas.
           were.3PL sharp.FEM.PL

           'Juan didn't cut Pablo with scissors; it was Eduardo who did, and they were sharp.'

b. Josephine n'a   pas coupé Marie avec un couteau; **c'était Camille**,
Josephine NEG'has NEG cut   Marie with a   knife.MASC; it.was Camille,
et   il   était rouillé.
and 3SG.MASC was   sharp.MASC

'Josephine didn't cut Marie with a knife; Camille did, and it was sharp.'

c. Ingo hat Hans mit der Schere   nicht geschnitten, **es war Uwe**,
Ingo has Hans with the scissors.FEM.SG NEG cut.PART;   it was Uwe,
und sie war scharf.
and it was sharp.

'Ingo didn't cut Hans with the scissors; Uwe did, and they were sharp.'

d. Lucii   neřízl nůžkami Honza; **byl to Jiří**, a   byly   ostré.
Lucie.ACC NEG.cut scissors.INS Honza; was that Jiří, and they.were sharp.

'Honza didn't cut Lucie with scissors; it was Jiří, and they were sharp.'

Although to an indefinite under negation cannot act as an antecedent, an indefinite DP under VP ellipsis can. This is demonstrated in (66), where the addition of an elided DP is able to repair the sentences.

(67) a. * Juan no   cortó a   Pablo con tijeras;   **Eduardo lo   hizo**, y
Juan NEG cut   ACC Pablo with scissors.FEM.PL; Eduardo   that did,   and
estaban   afiladas.
were.3PL sharp.FEM.PL

'Juan didn't cut Pablo with scissors; Eduardo did it, and they.were sharp.'

b. ? Josephine n'a   pas coupé Marie avec un couteau;   **Camille l'a**
Josephine NEG'has NEG cut   Marie with a   knife.MASC; Camille it'has
fait, et il   était rouillé.
done, and 3SG.MASC was   sharp.MASC

'Josephine didn't cut Marie with a knife; Camille did that, and it was sharp.'

c. * Ingo hat Hans mit der Schere   nicht geschnitten; **Uwe hat das**
Ingo has Hans with the scissors.FEM.SG NEG cut.PART;   Uwe has that
gemacht, und sie war scharf.
done,   and it was sharp.

'Ingo didn't cut Hans with the scissors; Uwe did that, and they were sharp.'

d. * Lucii   neřízl nůžkami Honza; **udělal to Jiří**, a   byly
Lucie.ACC NEG.cut scissors.INS Honza; did   that Jiří, and they.were
ostré.
sharp.

'Honza didn't cut Lucie with scissors; Jiří did it, and they were sharp.'

In (67), however, which features various verbal proforms instead of ellipsis, there is no available antecedent, and the sentence crashes. Thus, we see that across Spanish, French, German, and Czech, verbal proforms do not license missing antecedents, whereas VP ellipsis does.

(68) a. Creo   que Juan vio a   un actor, y   pudo   haber sido Antonio
          I.think that Juan saw ACC an actor, and it.could have   been Antonio
          Banderas.
          Banderas
          'I think that Juan saw an actor, and it could have been Antonio Banderas.'
      b. Je pense que Jean a   vu une actrice, et ça   pu   être
          I think that Jean has seen an actress, and that would.have can.PART be
          Audrey Tautou.
          Audrey Tautou
          'I think that Jean saw an actress, and it could have been Audrey Tautou.'
      c. Ich denke, dass Ingo eine Schauspielerin gesehen hat, und es hätte
          I   think, that Ingo an   actress   seen   has, and it would.have
          Martina Gedeck sein können.
          Martina Gedeck be   can
          'I think that Ingo saw an actress, and it could have been Martina Gedeck.'
      d. Myslím, že   Honza poznal nějakou ženu,   a   to   by   mohla být ta
          I.think, that Honza met   some   woman, and DEM COND could be The
          pravá.
          One.FEM
          'I think that Honza met a woman, and she could be The One.'

Extending this test to TP ellipsis, here in (68) we see an example of indefinite DPs acting as antecedents.

(69) a. *No creo   que Juan haya   visto a   un actor, y   pudo   haber sido
          NEG I.think that Juan has.SUBJ seen ACC an actor, and it.could have   been
          Antonio Banderas.
          Antonio Banderas
          'I don't think that Juan saw an actor, and it could have been Antonio Banderas.'
      b. *Je ne   pense pas que Jean ait   vu une actrice, et ça
          I NEG think NEG that Jean has.SUBJ seen an   actress, and that
          aurait   pu   être Audrey Tautou.
          would.have can.PART be   Audrey Tautou
          'I don't think that Jean saw an actress, and it could have been Audrey Tautou.'

    c.   * Ich denke nicht, dass Ingo eine Schauspielerin gesehen hat, und es
             I   think NEG, that Ingo an   actress   seen   has, and it
             hätte   Martina Gedeck sein können.
             would.have Martina Gedeck be   can

             'I think that Ingo saw an actress, and it could have been Martina Gedeck.'

    d.   * Nemyslím, že   Honza poznal nějakou ženu,   a   to   by   mohla být
             NEG.I.think, that Honza met   some   woman, and DEM COND could be
             ta   pravá.
             The One.FEM

             'I don't think that Honza met a woman, and she could be The One.'

In contrast, the ungrammatical sentences of (69) feature negation that scopes over the indefinite DP, depriving the pronoun in the later clause of an antecedent.

(70)   a.   Pablo no   cree   que Juan haya   visto a   un actor; **yo creo que sí**,
             Pablo NEG thinks that Juan has.SUBJ seen ACC an actor; I   think that yes,
             y   pudo   haber sido Antonio Banderas.
             and it.could have   been Antonio Banderas

             'Pablo doesn't think that Juan saw an actor; I think so, and it could have been Antonio Banderas.'

    b.   Héloïse ne   pense pas que Jean ait   vu   une actrice; moi,   **je**
             Héloïse NEG thinks NEG that Jean has.SUBJ seen an actress; 1SG.strong, I
             pense que oui, et   ça   aurait   pu   être Audrey Tautou.
             think   that yes, and that would.have can.PART be   Audrey Tautou

             'Héloïse doesn't think that Jean saw an actress; I think so, and it could have been Audrey Tautou.'

    c.   Gertrude denkt nicht, dass Ingo eine Schauspielerin gesehen hat; ich denke
             Gertrude thinks NEG, that I   an actress   seen   has; **I   think**
             schon, und es hätte   Martina Gedeck sein können.
             so,   and it would.have Martina Gedeck be   can

             'Gertrude doesn't think that Ingo saw an actress; I think so, and it could have been Martina Gedeck.'

    d.   Jiří nemyslí,   že   Honza poznal nějakou ženu; **já myslím**, **že   ano**,
             Jiří NEG.thinks, that Honza met   some   woman; I   think,   that yes,
             a   mohla by   to   být ta   pravá.
             and could   COND DEM be The One.FEM

             'Jiří doesn't think Honza met a woman; I think so, and she could be The One.'

Finally, in (70), when a sentence corresponding to English *I think so* is added after an indefinite DP under the scope of negation, the sentence becomes grammatical once more.

Thus, we see that *I think so* in English, Spanish, French, German, and Czech patterns with VP ellipsis and not with VP proforms, providing evidence for ellipsis after embedded polarity particles. Importantly, this holds across typologically diverse languages, as we see evidence for ellipsis not only in Romance and Slavic, which have no particular polarity particles for embedded contexts, but also in Germanic, where matrix and embedded particles are not identical.

4.3   Licensing of novel idiomatic readings

In addition to the availability of antecedents, a second area where the behavior of proforms and elided material diverges is in idiomatic readings. Both VP ellipsis and VP proforms are able to contain the idiomatic reading of a phrase already in the discourse, as shown below:

(71)   a.   Beatrice pulled some strings, and Samantha did, too.
       b.   Beatrice pulled some strings, and Samantha did that, too.

In (71a–71b), both VP ellipsis (*did*) and the VP proform *did that* carry the idiomatic meaning of the VP *pull strings*. However, although ellipsis and proforms can both contain idiomatic meanings, only ellipsis can introduce a new idiomatic reading. Consider the following asymmetry.

(72)   a.   Today at the zoo, the lion broke loose, and all hell **did**, too.
       b.   * Today at the zoo, the lion broke loose, and all hell **did that**, too.

The first clause of both examples in (72) contains the VP *broke loose*, part of the larger idiom *all hell broke loose*. Although (72a) may seem tongue-in-cheek or overly aware of its own wordplay, what's important is that the idiomatic reading prevails. In contrast, the proform in (72b) crashes, unable to carry the idiomatic reading of *all hell broke loose*.

I take the explanation of these facts to be similar to the reasoning behind the missing antecedent test of Grinder and Postal (1971) and Bresnan (1971), explained in section 5.2. With ellipsis, since material is still syntactically present despite not being pronounced, each

piece of the idiom remains in the syntax. I sketch an analysis of (72a) and (72b) below in (73).

(73) a. (=72a) The lion broke loose, and all hell did [VP ~~break loose~~], too.
      b. (=72b) The lion broke loose, and all hell [VP did [DP that]], too.

Because idiomatic readings are dependent on a configuration of specific lexical items (in this case, *all*, *hell*, *break*, and *loose*), (72b) cannot license an idiomatic reading that is new to the discourse because it does not have all of these lexical items.

Interestingly, the intervening *did* triggered by VP ellipsis has no effect on the idiomatic reading of the sentence. This can be seen even in the absence of ellipsis, as in the following utterance:

(74) No, I swear, all hell really *did* break loose!

In other words, having do-support and extra modifiers such as *really* on top of the bare pieces of the idiom does not preclude the idiomatic interpretation. However, as we see in the unacceptability of (72b), not having all the necessary lexical items together does affect the availability of idiomatic readings.

Returning to instances of TP ellipsis, I now examine the complex English idiom *to think one's shit doesn't stink*[5], which allows this test to be extended to test for ellipsis after *I think so*. Since I am arguing that TP ellipsis does indeed occur after embedded polarity particles, we would expect to see the idiomatic reading, a prediction that is borne out in the example below.

(75) I've heard breastfed babies' shit doesn't stink, and after they're raised in selfie culture, they'll probably think so, too.
      (Paraphrase: I've heard breastfed babies' shit doesn't stink, and after they're raised in selfie culture, they'll probably have an overinflated sense of self.)

Parallel to my analysis of (72a) in (73a), I take the existence of an idiomatic reading in (75) as evidence for an elided *their shit doesn't stink* beneath the predicate *think*. Importantly,

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[5]An idiom that means, roughly, *to think very highly of oneself*, generally in an exaggerated or undeserved manner.

although the embedded clause has a literal reading in the first half of the sentence, when *think* appears later, the idiomatic reading is available, suggesting the other necessary lexical items for the idiom are present, albeit elided.

5   Conclusion

As we have seen, my proposal that polarity particles are focused elements, followed by TP ellipsis, is able to both account for data from past proposals and make new predictions. This proposal can account for important observations from the previous ellipsis accounts of Kramer and Rawlins (2009) and Holmberg (2013). Additionally, it is not incompatible with Farkas and Roelofson (2013)'s feature based analysis of absolute and relative polarity.

In addition to demonstrating compatibility with others' proposals, I have examined several of the strong predictions made by the treatment of *yes*, *no*, *I think so*, and *I think not* as instances of sluicing. Like wh-sluices, polar sluicing has the capacity to be ambiguous when multiple variables are present. Additionally, polarity particles are in complementary distribution with other focused elements, and in languages with productive structural focus positions, polarity particles occur in the same position as other embedded focused elements.

Finally, I have shown that there is independent evidence to conclude that ellipsis occurs after the embedded polarity particles *so* and *not*, as they behave like instances of VP ellipsis and not VP proforms when it comes to the licensing of missing antecedents and new idiomatic readings. Importantly, this behavior cuts across typological differences in languages, holding whether or not the language requires a complementizer before embedded polarity particles and whether or not it has a separate set of particles for embedded contexts. Furthermore, I presented connectivity effects from Wambeek Dutch suggesting that bare polarity particles are accompanied by an elided TP.

Remaining questions include why Germanic cannot embed *yes* and *no* in the same way that Romance, Slavic, Hungarian, and Greek can. In other words, why is *I think that yes* ungrammatical in English and German? It may be worth investigating whether this property

of Germanic is correlated with some other property of the languages. Moreover, even looking within Germanic languages, we have seen that English *so* and German *schon* have different distributions, although it is unclear why these particles behave differently.

In fact, there are even more attested ways to express the equivalent of *I think so* in different languages than I analyze in this paper. One such construction from Swedish involves the use of a demonstrative pronoun.

(76)   a. Jag tror det.
            I   think DEM
           'I think so.'

       b. Jag tror inte det.
            I   think NEG DEM
           'I think not.'   (Björn Ordoubadian p.c.)

Because constructions such as (76) contain a demonstrative, they resemble (at least superficially) VP proforms like *do that* and *do it.* Tests must be run on these languages to see if they too pattern with English, German, Spanish, French, and Czech, which I have investigated above, or if they are cases of proforms as proposed by Sailor (2012).

Furthermore, Dutch, which I do not discuss here, is like English and German in that it too has a specific set of embedded polarity items, but unlike their relatives, they require a preceding prepositional element. Italian also uses a preposition corresponding to English *of* to introduce its embedded polarity particles. Unlike Dutch, however, it makes no distinction between matrix and embedded polarity items.

(77)   a. Ik denk van wiel/niet.
            I think of   so/not.
           'I think so/not.'   *Dutch*

       b. Credo di sì/no.
            I.think of yes/no
           'I think so/not.'   *Italian*

Following Kayne (1981)'s analysis of infinitival French *de* 'of' and Italian *di* as complementizers, the prepositions in (77) above may be best analyzed as complementizers.

Another open question concerns the choice of complementizers not just across different

languages but within the same language. A unifying theory of sluicing across all languages should be able to explain why a language like Hungarian uses the same complementizer before polarity particles, wh-phrases, and non-wh focused phrases, but a language like English forbids an overt complementizer before all types of sluicing. Even within just one type of sluicing in one language, the choice of complementizer can vary. In Hungarian and in Greek, the choice of predicate can lead to varying judgments about the presence or absence of an overt complementizer.

(78) Hungarian
  a. Gondolom, (hogy) igen/nem. (=7)
      I.think,   (that) yes/no
      'I think so/not.'
  b. Emlékszem, *(hogy) igen/nem.
      I.remember, *(that) yes/no
      'I remember so.'

(79) Greek
  a. Nomizo (pos) ne/oxi. (=8)
      I.think (that) yes/no
      'I think so/not.'
  b. Fovame   ??(pos) ne/oxi.
      I'm.afraid ??(that) yes/no
      'I'm afraid so/not.'

Whereas the predicates corresponding to *think* in both languages are compatible with complementizer absence, other predicates strongly prefer an overt complementizer. A complete account of complementizer choice in instances of sluicing will have to be able to predict such variation, not just across languages but within the same language.

These questions all concern the range of possible languages; in other words, what are the limits of typological variation among embedded polarity particles? Furthermore, are these different properties across languages correlated with any other properties? I leave these questions open for further research.

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Works Cited

Authier, J.-Marc. 2011. "A movement analysis of French modal ellipsis." Probus 23:175–216.

Authier, J-Marc. 2013. "Phase-edge features and the syntax of polarity particles." *Linguistic Inquiry* 44.3:345-389.

Bresnan, Joan. 1971. "A Note on the Notion Identity of Sense Anaphora." Linguistic Inquiry 2.4: 589-597.

Cushing, Steven. 1972. "The semantics of sentence pronominalization." *Foundations of Language* 9:186-208.

Farkas, Donka. 2010. "The grammar of polarity particles in Romanian." *Edges, heads, and projections: Interface properties*, ed. by Anna Maria Di Sciullo and Virginia Hill, 87–124. Amsterdam: John Benjamins.

Farkas, Donka, and Kim Bruce. 2010. "On reacting to assertions and polar questions." Journal of Semantics 27.1.81–118.

Farkas, Donka, and Floris Roelofson. "Polarity particle responses as a window onto the interpretation of questions and assertions." Language 91.2: 359-414.

Grinder, John, and Paul Postal. 1971. "Missing antecedents." Linguistic Inquiry (1971): 269-312.

Hankamer, Jorge, and Ivan Sag. 1976. "Deep and surface anaphora." Linguistic Inquiry 7.3: 391-428.

Hatting, André. "Ich denke schon, dass der Aufschrei berechtigt ist." *Deutschlandradio Kultur.* 26 January 2012.

Holmberg, Anders. 2013. "On the syntax of yes and no in English." *Newcastle Working Papers in Linguistics* 18:52-72.

Kayne, Richard. 1981. "On certain differences between French and English." Linguistic Inquiry 12.3: 349-371.

Kleypas, Lisa. 2002. *Nezkrotná touha.* Translated by Michaela Trubačíková.

Kramer, Ruth and Kyle Rawlins. 2009. "Polarity particles: an ellipsis account." *Proceedings of NELS* 39.

Kramer, Ruth and Kyle Rawlins. 2010. "Polarity particles and ellipsis: a (somewhat) crosslinguistic perspective." Handout presented at the Polarity Particle Workshop at the University of California, Santa Cruz.

Laka, Itziar. 1990. "Negation in syntax: On the nature of functional categories and projections." Ph.D. dissertation, MIT.

Merchant, Jason. 2001. *The syntax of silence: Sluicing, islands, and the theory of ellipsis.*

Merchant, Jason. 2004. *Fragments and ellipsis.* Linguistics and Philosophy 27.6: 661-738.

Pope, Emily. 1976. *Questions and answers in English.* The Hague: Mouton.

Puskás, Genoveva. 2000. *Word Order in Hungarian: The Syntax of A' Positions.*

Rizzi, Luigi. 1997. "The fine structure of the left periphery." *Elements of grammar*: 281-337.

Sailor, Craig. 2012. "You can't regret so (even if you think so)". Paper presented at the Illinois Language & Linguistics Society.

van Craenenbroeck, Jeroen. 2004. "Ellipsis in Dutch Dialects." Ph.D. dissertation, University of Leiden.

van Craenenbroeck, Jeroen, and Anikó Lipták. 2013. "What sluicing can do, what it can't, and in which language." *Diagnosing Syntax*: 502-536.