A New Puzzle about Discourse-Initial Contexts*

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In this note, I shall present a puzzle that arises from thinking about the
ways certain constructions behave in discourse-initial contexts. It has long
been observed that a range of constructions in natural language tend to be
infelicitous when appearing discourse-initially. Varieties of ellipsis provide the
examples I shall focus on here. For instance, we see (cf. Merchant, 2004):[1]

(1)   a. # I don't know what.
       b. Jack bought something, but I don't know what.

With no linguistic antecedent, the ellipsis is unacceptable, but a linguistic
antecedent renders it acceptable.

   Though ellipsis and some other phenomena often fail in discourse-initial
contexts, it has often been observed that they can be acceptable, if the con-
text is just right. Here is an example from Roberts (2010):

(2)   Context: A guy is standing in front of a make-shift monument on the
       sidewalk in front of a house where two neighborhood kids carried out

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    [1]Following standard practice, I shall mark sentences that are unacceptable in their
contexts with a '#', and describe them as 'infelicitous'. As ellipsis is broadly part of
syntax, there may be cases where one might prefer a gloss of 'ungrammatical', but I shall
not explore that question here.

a suicide pact earlier that week. Another neighbor comes up to stand beside him, also silently gazing at the monument. After a while, one of them says:

a. I just cannot fathom why.

In some contexts, ellipsis is possible without prior discourse.

In recent years, there has been an explosion of work on the nature of these sorts of discourse-initial cases, thank in large part to Stainton (1995, 2005, 2006b) and Stanley (2000). This work has focused on what happens in the discourse-initial cases: what sorts of syntactic structures really appear in those cases, and what enables them to succeed semantically and pragmatically. These issues have become important for understanding how syntax, semantics, and pragmatics relate. I shall here attempt to raise a different question. Discourse-initial cases are hard. They are somewhat unusual, and make heavy demands on context. In contrast, non-discourse-initial ones are easy. They occur readily, and make no special demands on context. The new puzzle I shall raise is why the non-discourse-initial ones are so easy. To put the point a bit melodramatically, why should so much noise from speech easily do what otherwise is very hard? I shall argue that this is a genuine puzzle, and point towards some directions we might explore to address it. I shall not attempt to solve the puzzle here. I do not think the puzzle is intractable, but I shall suggest that thinking about it may help us to better understand how the mechanisms of context and grammar interact.

The plan of this note is as follows. In the first section 1, I shall briefly present some background from the current discussion of ellipsis in discourse-initial contexts, and review some of the questions that discussion has raised. In section 2 I shall present the new puzzle. Finally, in section 3, I shall gesture towards some possibilities for responding to the puzzle. This will help to illustrate why the puzzle is really a puzzle, and what we might learn from solving it.

1   Background

Before getting to the new puzzle, I shall review some background on ellipsis in discourse-initial contexts, and some of the questions it has raised. But first, we should pause to note just what *discourse-initial contexts* are.

Linguistic contexts come richer or poorer in how much information they provide, and in informationally impoverished contexts, communication can

be difficult. Most contexts are quite rich, providing a range of salient objects, shared presuppositions across speakers, previous discourse, and so on. Some are very impoverished. Imagine, or recall, being woken up in the middle of the night by a phone call. It is likely that extremely little information will be available to help you understand what is said over the phone, and you might at that moment be rather slow to make use of what information is available. If a panicked and garbled voice says to you *He did it*, you might fail to understand what is being said to you, even if in the cold light of day that sentence said by that person could be readily understood.

Though this sort of context is informationally very impoverished, it is not null, i.e. devoid of all information. It is doubtful that any context is genuinely null.[2] But even if there are no fully null contexts, there are discourse-initial contexts: contexts that contain no prior discourse. The night-time phone call scenario is one. Discourse-initial contexts are generally impoverished, as discourse is one of the ways we regularly add information to contexts. And, needless to say, they lack one very specific feature: prior discourse itself, which is one important source of information in contexts, and comprises a kind of information.[3]

Discourse-initial contexts have been important to some recent in work on the interface between semantics, pragmatics, and syntax. One reason is that there appear to be specific constructions in natural language that (to some degree) require prior discourse in a context. Most of these constructions are loosely characterizable as 'anaphoric', which indicates that they require prior linguistic material in the context to which they somehow link back. Without that material, their use can be infelicitous, or even ungrammatical.

The main example of this sort of phenomenon I shall focus on here is ellipsis. It is part of the common wisdom that ellipsis cannot occur without

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[2]See Bach (1999) and Bach and Harnish (1982). They are replying to Katz (1977) and Katz and Fodor (1963), who appeal to a notion of null context to try to isolate aspects of meaning that fall within the scope of linguistic competence. The phone call scenario is suggested by Merchant (2004).

[3]We can find clear enough examples of discourse-initial contexts, and that is what I shall rely on here. But it is not an easy to articulate just what makes a context not contain prior discourse. After all, the participants are likely to have engaged in plenty of speech in the past. At a minimum, we expect that speech to be in some way informationally isolated from a discourse-initial context. From a more theoretical perspective, most theories of discourse see each discourse as a highly structured entity, which will have an initial point. Overviews of such theories can be found in Asher and Lascarides (2003) or Kehler (2004), among places.

linguistic antecedents. For instance, in the classic discussion of Hankamer and Sag (1976, p. 392), they identify a class of what they call "surface anaphora" which includes VP ellipsis, and argue that it requires "a coherent antecedent in surface structure." This has become sufficiently enshrined in the common wisdom that the survey article by Johnson (2001, p. 439) starts with "VP ellipsis is the name given to instances of anaphora in which a missing predicate ... is able to find an antecedent in the surrounding discourse ...." The common wisdom is supported by such examples as this one from Hankamer and Sag (1976):

(3)   Context: Hankamer attempts to stuff a 9-inch ball through a 6-inch hoop.

    a.   # It's not clear you'll be able to.

    b.   It's not clear you'll be able to do it.

(The judgment markings here are those Hankamer and Sag report.) We saw similar examples with sluicing (eliding the clausal complement of a *wh*-phrase) in (1). To fill in the context more, we might add:

(4)   Context: Jack is walking into the room, carrying his bag.

    a.   # I don't know what.

    b.   I don't know what that is.

    c.   Jack bought something but I don't know what.

Indeed, the common wisdom can seem inevitable, if you think of ellipsis as some sort of deletion process, where there must be some material to be deleted. In discourse-initial contexts, there is no such material.[4]

  Like most common wisdom, this one looks doubtful. It is fairly well established that there are at least some cases where ellipsis is acceptable in discourse-initial positions. We saw a sluicing examples in (2). Here is VP ellipsis example (cf. Stanley, 2000):

(5)   Context: Looking at someone about to jump off a bridge. One by-stander says to another:

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[4]As much as possible, I shall avoid any commitments about the nature of ellipsis, though I shall appeal to a few ideas about it in section 3 for argument's sake. For a review of the theoretical options, and references, see Merchant (forthcoming). A more philosophically oriented overview is given in Stainton (2006b). For an in-depth exploration of sluicing see Merchant (2001). The name 'sluicing', as do so many of the evocative names in syntax, comes from Ross (1969).

a. She won't.

These examples show that in spite of the common wisdom, ellipsis can sometimes occur in discourse-initial contexts.

Actually, as is so often the case, the common wisdom was not really so universally accepted, and might never have been offered without noting exceptions. Examples like these were already presented by Schachter (1977), followed by Stanley (2000), and then Merchant (2004). In fact, Hankamer and Sag (1976) mention a few potential exceptions in their original paper.

Since Hankamer and Sag's paper, the debate has moved on in several directions. There has been some discussion of how great the range of exceptions to the common wisdom might be, and if they might be given special treatment, as Hankamer (1978) argues in his response to Schachter, followed by Chung *et al.* (1995) and Pullum (2001). Implicitly Stanley, and explicitly Merchant (2004), reject some of Hankamer and Sag's judgments, including those I reported in (3). There has also been a lively discussion of whether the discourse-initial occurrences of VP ellipsis or sluicing really have the same structure and rely on the same mechanisms as the non-discourse-initial cases, i.e. whether they are genuine ellipsis. Notable is the recent exchange between Merchant (2004) and Stainton (2006a), as well as some suggestions from Ginzburg and Sag (2000). This debate has taken place within a wider one about the nature of a larger class of *fragments*, i.e. seemingly subsentential constructions that appear to function as sentences in some environments (e.g. Barton, 1990; Ginzburg and Sag, 2000; Ludlow, 2005; Morgan, 1973, 1989; Progovac *et al.*, 2006; Stainton, 2006b; Yanofsky, 1978). A rich philosophical debate has also developed, about what these sorts of fragments might show us about the semantics-pragmatics interface (e.g. Elugardo and Stainton, 2005; Stainton, 2006b; Stanley, 2000).[5]

2   The New Puzzle

Our discussion of the background on discourse-initial ellipsis in section 1 shows that there are some cases of discourse-initial ellipsis (or at least, cases that share the same surface form as ellipsis), but they are somewhat rare. As we observed, there are some puzzles about these cases, which have received

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[5]Other constructions have also been thought to resist use in discourse-initial contexts, such as the iterative *too* (Gauker, 2008; Heim, 1992; Kripke, 2009; Roberts, 2010).

significant attention: what makes these cases possible, how wide-spread are they, and what mechanisms are at work in them? One common thread in the discussion of these issues is that the discourse-initial cases are *hard*. They place great demands on context, which can only be met in special circumstances. Hence, they appear to be rare, and it is a point of debate what mechanisms, in context or in grammar, are involved in them.

This set of issues constitutes the 'old puzzle'. The new puzzle I shall propose looks at things from the opposite direction. If discourse-initial ellipsis is *hard*, then what, I shall ask, makes non-discourse-initial ellipsis so *easy*? Why, to put it melodramatically, should just having some much more noise from speech make things any easier.

In this section, I shall present the new puzzle, and argue that is there really is a puzzle here. But, I hasten to say, it is not the sort of puzzle that leaves us with no idea where a solution might be found. As I shall very briefly discuss in section 3, there are some natural avenues for exploration that might address it. But nonetheless, it is an interesting question that deserves an answer. To show this, we will first need to examine a little more closely what makes the discourse-initial cases hard, to fill in the contrast with the non-discourse-initial cases. This will require a very brief foray into pragmatics. The issues involved are complex and have been extensively investigated, and I shall delve into them only as deeply as is required to illustrate the ways in which discourse-initial ellipsis is hard.

As I mentioned in section 1, ellipsis can be classified as broadly 'anaphoric', in that we typically need a link from the ellipsis site to an antecedent. It is a commonplace observation that with any such anaphoric phenomenon, context must provide a suitable *salient* antecedent. In discourse-initial situations, this would mean having a suitable salient non-linguistic target: a property or action or event type for VP ellipsis, or a proposition for sluicing. One reason that discourse-initial ellipsis is hard is that it is not so easy for a context to render a property or proposition suitably salient. There are several reasons for this. Contexts, as I already mentioned, are almost always informationally very rich, and so even discourse-initial contexts can contain a huge array of properties or propositions to choose from. If *pushing* is available in a context, then likely so too will be *moving* or *touching*. Also, the ways contexts can single out or make salient actions or properties tend to be somewhat more indirect than the ways they can make objects salient. Salient actions are often not being carried out in the contexts where we talk about them, so we often have no recourse to deixis-like mechanisms to ren-

der actions salient. Likewise, there is often no simple feature of an utterance environment which all by itself makes a property salient the way an object can be salient in the environment.[6]

In spite of these difficulties, we are sometimes able to make the right properties or actions salient, as the examples we already discussed show. Here is another case:

(6) Context: A vial containing a dangerous virus has been broken in the lab. We might have been exposed if the virus aerosolizes. We quickly put a sample in the machine that will tell us if it does.[7] We are staring at the machine waiting for its results. One of us says:

    a. Does it?

The property expressed by *aerosolize* is obviously highly salient here, by any way of spelling out salience. Our shared interests in the context, together with the machine and our focus of attention on it, combine to make that property sufficiently salient to support ellipsis.

With most anaphoric phenomena, if there are too many targets, the anaphora fails.[8] The fact that many contexts provide multiple properties or actions makes this all too easy to find for ellipsis, as in:

(7) Context: Same as in (6), but we are looking at two different machines waiting for results. One will tells us if the virus will infect humans, the other if it aerosolizes. One of us says:

    a. # Does it?

Both the properties of *aerosolizing* and *infecting humans* are highly salient, but that is not sufficient to support ellipsis. One moral then is that for discourse-initial ellipsis a *very high degree of salience* is required, and that this is hard for contexts to provide.

Though what is observable in utterances environments does not readily single out properties or actions, there are other features of context which help us to narrow down the space of potential targets for anaphora. I shall mention two that apply to ellipsis. First, setting a discourse topic can help. Following a well-established tradition (e.g. Ginzburg, 2012; Roberts, 1996), we can think of a discourse topic as like a question under discussion, which

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[6]These points are much-discussed in the acquisition literature (e.g. Gleitman, 1990).

[7]Unfortunately, as far as I know such a machine has not yet been invented.

[8]Different anaphors are more or less sensitive to this. As is well know, in some cases pronoun resolution can occur when there are multiple possible antecedents for the pronoun.

can be set by overtly asking a question. The right topic can render an otherwise infelicitous ellipsis acceptable:

(8) Context: Same as (7).
  a. Speaker A: How does the virus spread?
  b. Speaker B: Does it?

In this context, the ellipsis is acceptable.[9] The discourse topic, or more likely an immediate sub-topic, is set by Speaker A's question. That leaves both *aerosolizing* and *infecting humans* salient, but narrows the relevant choice down to *aerosolizing.*

One of the easiest ways to set a discourse topic is by overtly asking a question, but that is unavailable in discourse-initial contexts. This is not to say discourse-initial contexts cannot contain discourse topics, set implicitly by the context. They can, but it is hard. Especially, it is hard for a context to implicitly set the kind of specific topic that a question can set, and is often needed for ellipsis. For instance:

(9) Context: A huge display above the wall in the lab is showing the distribution of a virus in bird populations globally, updated in real time as it spreads. At the same time, we are running both machines as above, and looking for the results. One of us says:
  a. ?? Does it?

The display could well set a top-level discourse topic, much like a question does. But, it appears to be non-specific; more like *What does the virus do?* than *How does it spread?* or *Who might it spread to next?*. That leaves the utterance in (9) infelicitous (though at least to my ear the added information makes it somewhat better than in (7), and hence the '??' marking).

So far, we have observed that for discourse-initial ellipsis to succeed, we need the target to be extremely high in salience, which places a heavy burden on context. Though often discourse topics can help narrow the range of options, it is hard to set sufficiently specific topics discourse-initially. I shall mention one other factor relevant to discourse-initial ellipsis. Sometimes the range of options for anaphora can be restricted by the structure of the interaction in which an utterance takes place. For instance, standing background knowledge about a type of interaction can be involved, such as

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[9]It might remain slightly degraded, but to my ear, it is much better than in (7).

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what happens when you go to a restaurant. (The AI literature discusses representations of this sort of knowledge in terms of 'frames' or 'scripts'.) More local shared plans, like how to prepare some particular dish for dinner, can also play a role.[10] So, for instance, the following context supports a quite specific discourse-initial ellipsis:

(10)   Context: You see someone repairing a car. She is reaching into the engine with one hand, and stretching towards a wrench with the other. She says:

     a. Can you?

We understand the utterance as expressing *Can you give me that wrench.* This works in part because of background knowledge about how people work on cars, but also presumably because there is a salient wrench. The various features of context work together to support ellipsis.

As before, the success of ellipsis hinges on very particular features of the context. Obviously, in (10), if there were a wrench and a hammer next to each-other, the utterance would be much worse. But also, many scripts or plans are not specific enough to support discourse-initial ellipsis. For instance:

(11)   Context: We are starting to cook dinner, as we normally do. I open the refrigerator, and say to you:

     a. #I didn't.

Most situations of starting to cook would not make this specific enough. The context does not determine if my utterance was intended to mean *I did not go shopping*, or *I did not marinate the meat*, etc. Of course, if we have *extremely* specific habits about cooking, it might be clear which of these is the antecedent, but even a fairly robust plan like cooking a familiar dinner does not by itself make the context sufficiently rich. Of course, in many real conversations, we make features of the plan more explicit as the conversation evolves, but that is of no help for discourse-initial cases.

We have now seen a few features of context that can help support discourse-initial ellipsis. Salience, topic, and background knowledge (perhaps in the form of scripts or plans) can all help make discourse-initial ellipsis possible. As with any anaphoric process, we need the context to provide

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[10]These have been discussed at great length in the AI literature on frames, scripts, and plans, etc. Classic references include Carberry (1990) and Schank and Abelson (1977).

an antecedent. If there is a very highly salient property or proposition, that would suffice, but it is rare for a discourse-initial context to be so rich as to provide that. Topic or background knowledge can narrow the range of options down, so that a sufficiently salient target can be identified. But, as I have stressed, discourse-initial ellipsis is unstable, in that even small changes in these features of context can destroy the conditions needed for it. Discourse-initial ellipsis is hard in part because it is hard to exploit these features of context adequately in discourse-initial circumstances. It can be done, but it takes just the right combination of non-linguistic information to do it.[11]

Having seen some of the factors that allow some contexts to support discourse-initial ellipsis, we now have some idea what makes it hard. This, finally, brings us to my new puzzle. If discourse-initial ellipsis is so hard, and requires just the right combinations of contextual information to succeed, why is speech able to make ellipsis so easy? For the remainder of this section, I shall clarify the role of speech in the puzzle, which will help explain why it is a puzzle.

We have already seen that discourse can be a very efficient way to enrich a context. Setting a topic, laying out a plan, or singling something out as salient can all be done easily in discourse, and we have seen that doing so can render an otherwise infelicitous ellipsis felicitous. But what is striking about ordinary, non-discourse-initial ellipsis, and what makes the puzzle a puzzle, is that the speech involved in no way needs to do any of this. Ordinary ellipsis bypasses heavy demands on context, and the speech that creates the antecedents for ellipsis need not enrich the context in any of the ways we have considered.

To make this vivid, suppose we are in the presence of a device that generates random speech sounds, perhaps those specific to the language we are speaking. The machine has been running in the background for some time, and mostly spits out sounds which, but for being recognizably speech sounds, are just so much random noise.

Suppose we are back in the lab context used in some of the previous examples, where we are focused on some virus and its effects. Suppose that the speech machine has been running in the background. (Perhaps we found

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[11]I should stress that I am by no means claiming that these factors are independent. Each is a theoretically complex notion, and depending on how we spell them out, they may relate, or some may even reduce to others. For instance, notions of plan and structures of discourse topics come together, e.g. in work of Büring (2003).

its random noises calming in a stressful environment.) Consider:

(12) Context: As before. We are focused on the machines telling us about a virus. The display board shows the spread of the virus.

    a. Machine: I had a great day.

    b. Me: Um . . . I didn't.

My utterance in (12) appears fine, and the ellipsis is unproblematic. (Some might find it unnatural as it is presumably off-topic. I inserted some material to try to mark topic-discontinuity.) Here is one more example:

(13) Context: We are arguing about where to go to dinner. We are considering three specific options (cooking, ordering in, going to the local place). The speech machine is running the background and we are mostly ignoring its babble.

    a. Machine: Toshiro Mifune talked to someone in Guadalajara.

    b. Me: Hmm. . . I don't know who.

Again, the ellipsis appears fine.

The speech machine really does just produce 'so much noise', but the same effect can be produced in more mundane ways:[12]

(14) Context: We are waiting in line at the grocery store. The people behind us are having a conversation, of which we hear only a few words, and those words in no way fit with what we are talking about.

    a. Overheard from conversation behind us: Toshiro Mifune talked to someone in Guadalajara.

    b. Me: Hmm. . . I don't know who.

This is acceptable, just as (13) is.

What is striking about these cases is that by many measures, the speech machine and the overheard part of a conversation do not do what normal discourse does. They do not plausibly incorporate any new topic into a context. They do not enrich our understanding of any plan we were following. It is unclear why they should have helped raise anything to salience. The way we described the speech machine scenarios, the machine is running the background generating random noises, and those do not affect what is salient

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[12]I owe this example and example (15) to Ezra Cook.

in the context at all. It is just some random background noise. It is thus unclear why the noises from the machine that support ellipsis should make anything highly salient. Likewise, it is unclear why a few overheard words in a conversation unconnected to ours should make anything salient in our context. The speech machine produces random noises that are unrelated to the important features of the context, and do not have the kinds effects on context that real assertions do. The same goes for the overheard fragment of a separate conversation.

The new puzzle, then, is why this suffices for ellipsis; especially, as it is not clear why random noises would affect the context in ways that facilite anaphora resolution, why do they so easily support ellipsis? Why does mere speech sound, unconnected from other aspects of context, suffice to do what in discourse-initial settings placed such heavy demands on context?

3   Lines of Response

My main purpose in this note has been to pose the new puzzle. In this concluding section, I shall discuss a few strategies for responding to it. I shall not develop them in any detail here. My goal here is not to solve puzzle, but rather to use potential responses to it to assess how hard the puzzle is, and explore briefly what it might show us.

First, let us consider one natural response: perhaps the puzzle simply shows that a different mechanism, not based on context, is at work in cases of ordinary non-discourse-initial ellipsis. (This is in keeping with the position of Stainton, that the discourse-initial cases are not genuine 'syntactic ellipsis'.) I shall not take a stand on the complex issues of what the structure of the discourse-initial cases is. Because the main issue for the new puzzle is the non-discourse-initial ones, I fortunately do not have to. Rather, I shall point out how this response does not really make the puzzle go away.

To show this, I shall need to make a few assumptions about how ellipsis works in the ordinary cases. Any such assumptions are controversial, but where I need some details, I shall follow Merchant (2001, 2004). Where possible, I shall keep the assumptions as general as I can, so they will be compatible with other theories as well.[13]

[13]It would be useful to also consider a theory which posits no syntax in the ellipsis site, like that of Ginzburg and Sag (2000). Space precludes me from doing so here. As I am inclined to side with Merchant in his debate with Stainton, I shall opt for Merchant's

Merchant's theory is an example of one that treats ellipsis as a form of deletion, which is a grammatical process that starts with linguistic material, and somehow deletes it. Merchant's particular version has the deleted material simply not pronounced; deletion takes place entirely in the phonology, but there is syntactic material there anyway.

Theories of ellipsis must specify when this sort of deletion can take place. The tradition has long been to look for the right kind of parallelsim between the deleted material and an antecedent. (Hence, the common wisdom that ellipsis requires an overt linguistic antecedent.) Some theories posit forms of syntactic identity between the antecedent and the deleted material, but many recent theories, Merchant's included, have made the condition more semantic. For sluicing, Merchant suggests that (very very roughly) we need to be able to find an antecedent proposition in the discourse which stands in mutual entailment relations to the proposition expressed by the deleted material. We need suitable type adjustments for VP ellipsis, but the main idea is that there is an antecedent in the context which stands in a close semantic relation to the deleted content.

Most theories, including Merchant's, write into the condition for deletion that the deleted material stand in some relation to prior linguistic material. Thus, some form of grammatical parallelism is maintained. So, in specifying his deletion condition, Merchant requires entailments with something expressed by a *linguistic* antecedent. This is, again very roughly, his notion of *e-givenness*.[14]

Put aside for now the question of how this theory gets applied to the discourse-initial cases. (Merchant (2004) explores this question in depth.) Our question is why speech suffices for ordinary non-discourse-initial cases. It might appear that we have an answer: because ordinary ellipsis builds in a condition like e-givenness (or something along those lines), that makes specific reference to prior discourse. Speech provides prior discourse. But, I suggest, this is not much of an answer. We can restate the new puzzle in terms of e-givenness. The notion of e-givenness is supposed to be a form of salience—something that renders content available for anaphora-like processes. Why is it important, or required, that it be provided by overt linguistic material? Perhaps more importantly for our purposes, the speech machine cases show

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theory as my sample.

[14]This notion is derived from the account of givenness in Schwarzschild (1999). He puts the point very clearly, saying (Schwarzschild, 1999, p. 147), "An utterance is *given* if it is entailed by prior discourse."

that speech that otherwise has nothing to do with salience or other important aspects of context can make ellipsis easy. It is thus puzzling how e-givenness produces a form of salience able to support anaphora-like processes. This is just the new puzzle again. A notion like e-givenness may well be required, and perhaps examples like (1) provide evidence that it is required. Assuming it is (and I have no reason to doubt it), the new puzzle simply raises the question of why it is able to do the job the theory asks of it. We may have a good description of when ellipsis is easy, but we still lack a good explanation of why.

I hope this foray into deletion theories of ellipsis has served to illustrate why the new puzzle is robust, and interesting. Assuming theories like Merchant's are right about the way ellipsis works, we still have a puzzle. To conclude, I shall mention two ideas that might be relevant to solving the puzzle. As I promised, I shall be very brief about them, and only say enough to show that there are plausible open lines of response to the puzzle.

Both ideas I shall mention revolve around the issue of what I glossed above as 'so much noise from speech'. That may not be a fully accurate description of the speech machine cases. In the cases we considered, we did not merely have a speech machine randomly producing speech sounds that turn out to be well-formed sentences. We also supposed that the participants in the conversation *processed* those sentences. Whether or not the sentences were smoothly integrated into the discourse, or had any normal effect on the context, the participants *parsed* them, and *comprehended* them at least to some degree. I shall suggest that parsing and other aspects of sentence comprehension might be important to how prior discourse plays its role in ellipsis.

Here is one way that parsing might indicate a role for speech in ellipsis that sheds some light on our new puzzle. Especially when we consider deletion views of ellipsis, the grammatical mechanism at work does not merely require salience, but also linguistic material to delete. The conditions for deletion require that the to-be-deleted material be appropriately salient or e-given, and Merchant's particular version puts this in terms of the semantic content expressed by the to-be-deleted material. But this means that not only must appropriately salient semantic content be found in the context, but that content must be mapped to particular syntactic forms (a VP for VP ellipsis, or TP for sluicing). We can think of this as a very specific sort of salience, linked to syntactic forms. Apparently, if theories of the sort we are considering are right, this specific sort of salience is required for ellipsis. This

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is where parsing might enter, as parsing builds syntactic structures. One effect of 'so much noise', when it is parsed by participants in a conversation, is to enter syntactic structures into the context. Presumably having such structures available should help create the specific sort of salience we might need.

This, obviously, is no more than a vague suggestion, but it is a suggestion for a strategy that might explain the distinctive role of speech in ellipsis, and perhaps provide motivation for requirements like e-givenness.[15] However, it does not by itself solve the new puzzle. Simply entering syntactic structure into a context does not yet connect it to the sorts of features of context that seemed to be relevant in section 2. We have indeed moved from so much noise to so much syntax, but it is still not clear how that creates the extremely high degree of salience that seems to be involved in ellipsis.

My second suggestion is for a line of inquiry that might address this remaining question. Parsing does not merely create syntactic structures, it does so by having speakers engage in the activities of sentence processing. And moreover, speakers do not merely parse the sentences in question syntactically; they also understand them, at least to some minimal degree. One feature of these activities is that they make specific demands on the cognitive resources of speakers. It is a common idea that processing a sentence relies on the resources of working memory. It is controversial just what aspects of working memory are involved, and how they are engaged (cf. Caplan and Waters, 1999; Gathercole, 2007; van Gompel and Pickering, 2007; Just and Carpenter, 1992). I shall not review this controversy here; rather, I shall consider the possibility that in some way syntactic structures linked to some sort of semantic representations are entered into some appropriate working memory system. If this is right, we should further consider the possibility that doing so has the effect of raising elements to a very high degree of salience. Entering something into working memory (or whatever the right component of our memory system turns out to be) could well make it very highly salient. It becomes, so to speak, something we are cognitively currently working on, and that is indeed a form of salience. If what is made salient in this way is a syntactic form linked to a meaning, then what is made highly salient is just the sort of thing that ellipsis requires.

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[15]Of course, there has been psycholinguistic work on the processing of ellipsis that is relevant, e.g. Clifton and Frazier (2010), Frazier and Clifton (2005), and Tanenhaus and Carlson (1990).

If this suggestion is right, and I stress that it is far too rough a suggestion even to assess, it could shed some light on our new puzzle. Ordinary, non-discourse initial ellipsis is easy, according to the suggestion, because it uses our abilities to process speech. Those abilities allow us to do easily what is otherwise very difficult for a context to do. Conditions like e-givenness are appropriate because they reflect in the grammar what those abilities provide. Our abilities to process speech are substantial, and so it should not be surprising that they can make what seemed to be a hard task like supporting ellipsis turn out to be easy.

One small piece of evidence that processing might be important is that when we take processing out of examples like (12), the ellipsis seems to become infelicitous. Suppose we had some task we could give to speakers which would prevent them from parsing or comprehending the sentence generated by the speech machine in (12). To illustrate this, suppose in the lab setting of (12), that there is some very hard calculation that needs to be done, and suppose furthermore that its results are so vital to global health that the people in the lab focus on it with utmost intensity. Call this the *distracting task*. We could well imagine that when doing the distracting task, people might not notice that the speech machine is producing a genuine sentence of English, and may well not parse it. I believe we see:

(15)   Context: Same as (12), except that we are all carrying out the distracting task.
    a. Machine: I had a great day.
    b. Me: # I didn't.

The distracting task makes the utterance turn infelicitous. If we somehow make speech unprocessed by participants in a conversation, it seems to have no effect on the context, and is not sufficient for ellipsis. It really is then 'so much noise'. Processed speech is different, which might help explain why it is important for ellipsis.

The distracting task is a very crude way to imagine that some speech gets ignored in a context, and it is not all that surprising that such speech fails to support ellipsis. Thus, as I said, the evidence provided by (15) is small. The more substantial claim that I am considering is that it is the activity of sentence processing that makes the difference between (12) and (15). The way the speech machine's workings are described makes this an inviting claim, but obviously, more evidence is needed. For instance, psycholinguists have many ways to place loads on working memory and other systems implicated

in sentence processing, and it would be interesting to see how such loads might affect the acceptability of ellipsis in cases like (12).

My goal in this section has been only to indicate some lines of response to the new puzzle; to illustrate how substantial the puzzle is, and I hope, to illustrate how we might learn something from it. For instance, if my suggestion about processing and memory is on the right track, it indicates that a specific sort of salience, linked to processing, is at issue for ellipsis. This is unlike the sort of salience we tend to think about when we think of objects that are prominent in the environment, as it focuses on the on-line processing of information, rather than the source of the information.

This sort of salience is in other ways unlike many of the notions that are used in pragmatics in the more formal vein. Notions like discourse topic, as I have been discussing them, are fairly abstract, enabling links to grammar (through phenomena like focus), and to ways of representing the structure and dynamics of context in terms of information.[16] They tend not to be tied to processing, and indeed, they are basically not psychological notions. It is interesting that consideration of a grammatical phenomenon like ellipsis can, perhaps, make a role for aspects of language processing in our formal thinking about context.

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[16]The notion of salience at issue is closely related to some that have been discussed extensively in other strands of the pragmatics literature. It is close to the notion of givenness in Chafe (1976), the notion of givenness$_s$ or salience in Prince (1981), and the notion of activation in Gundel *et al.* (1993). Relations of anaphora, and specifically ellipsis, to processing are also discussed in Sag and Hankamer (1984).

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