Dialogue Informing Syntax/Semantics: The Case of Afterthoughts

Stergios Chatzikyriakidis
Centre for Linguistic Theory and Studies in Probability,
Department of Philosophy, Linguistics and Theory of Science
University of Gothenburg
stergios.chatzikyriakidis@gu.se

Abstract

In this paper, I look at the case of *afterthoughts* and claim that these can receive a natural syntactic explanation once they are seen as clarification strategies, more specifically, as answers to implicit clarification questions. I argue that this assumption paired with a framework that is suited to deal with structures that go beyond sentential syntax/semantics, in this case Dynamic Syntax, provides a natural explanation to the syntactic and intepretational intricacies associated with afterthoughts. On a more general level, the account advocates a view which methodologically uses dialogue modelling research to inform research on more core syntax/semantics issues.

1 Introduction

Looking at the syntactic literature on Right Dislocations (RD), one comes across a number of further categorizations. The one which has been prominent in a number of papers is the distinction between Backgrounded Right Dislocation (BRD) and Afterthoughts (ATs). This has been advocated by Averintseva-Klisch (2008a,b) for German, Ott and de Vries (2014); De Vries (2007) for Dutch, Chafe (1988) for English and Chatzikyriakidis (2017) for Greek among others. BRD functions as a content re-establisher device and has been claimed to involve comma intonation. On the other hand, ATs, as Averintseva-Klisch (2008a,b) claims, are clarification devices that carry the speaker's attempt to elucidate part of the preceding utterance/sentence and also exhibit period instead of comma intonation:[1]

(1) I know her, Ruth Kempson

(2) I know her... Ruth Kempson

[1]Comma intonation is noted with a single comma, and period intonation with three dots.

The two structures are not only different in their pragmatic/semantic import but also w.r.t their syntax. For example, in gender-marking languages, like German and Greek, gender mismatches can be attested between the dislocated element and its referent, something which is not possible for BRDs. The example below illustrates a gender-mismatch case from German taken from (Averintseva-Klisch, 2008b):

(3) Ich habe ihn$_i$ vorhin gesehen... das Kleine$_i$ von der Nachbarn
I have him$_{MASC}$ before seen, the little-one$_{NEUTR}$ of the neighbours

Besides the morphological mismatches, there are another two main differences between ATs and BRDs that I want to concentrate on in this paper: free positioning of ATs in the utterance sentence and optional additions. This gives us the following list containing three main properties relevant for ATs but not BRDs:

1. Morphological Mismatch
2. Free position in the utterance/sentence
3. Optional additions (e.g. "I mean") are possible

In what follows, I will argue that the corrective nature of ATs and its differences with BRDs can be explained once we make the assumption that ATs can be seen as clarification answers to an implicit question. Elaborating a bit, we claim that the speaker, by using an AT, tries to prevent a clarification question by the hearer, in effect by answering it. If this assumption is on the right track, then the minimum we need to model this idea, is a framework that is capable of going beyond the sentence level and deal with dialogue data. In this paper, I use Dynamic Syntax for this purpose.

The paper is structured as follows: in section 2, I provide a brief intro to Dynamic Syntax, concentrating on the features that are relevant for this paper. In section 3, I provide the main bulk of the analysis, putting forth an implementation of the idea which takes ATs to be answers to implicit questions. The difference between ATs and BRDs is discussed, and the main differences between are captured. There is also a discussion of specificational ATs and recursive ATs. In section 4, I conclude.

2 A brief Intro to Dynamic Syntax

The Dynamic Syntax (DS) framework (Kempson et al., 2001; Cann et al., 2005b) is a processing oriented framework, that has been successfully used both as a syntactic framework (Chatzikyriakidis, 2010; Bouzouita, 2008; Kempson and Kiaer, 2010; Gregoromichelaki, 2013; Seraku, 2013; Marten and Gibson, 2015), as well as a general framework for dialogue modeling (Gregoromichelaki et al., to appear; Eshghi et al., 2012, 2015; Kempson et al., 2016). One of the main ideas behind DS is that natural language syntax can be seen as the progressive accumulation of transparent semantic representations with the upper goal being the construction of a goal formula (expressed by means of a type requirement, of the form $?X$, where X is a type). This process is driven by monotonic tree growth, and attempts to model the way information is processed in a time-linear, incremental, word-to-word manner. The following example shows the beginning and the end stage of parsing the sentence *John upset Mary*:

(4)

$$?Ty(t), \diamondsuit \mapsto \; Fo(Upset'(Mary')(John')), Ty(t), \diamondsuit$$

$Fo(John')$, $Ty(e)$ $\quad$ $Fo(upset'(Mary'))$, $Ty(e \rightarrow t)$

$Fo(John')$, $Ty(e)$ $\quad$ $Fo(upset')$, $Ty(e \rightarrow e \rightarrow t)$

Note that we start with a requirement to obtain a propositional formula (expressed as $?Ty(t)$) and we end up with a tree encoding a propositional and where all its leaves have type and formula values.[2]

[2] Please see Kempson et al. (2001); Cann et al. (2005b) for a detailed exposition of the parsing process and the way composition works incrementally in DS.

2.1 Structural Underspecification and Parsing in Context

DS assumes structural underspecification to be a core feature of language processing. One of the basic mechanisms to encode this structural underspecification is the so-called unfixed nodes. These are nodes that have not yet found their position in the tree structure, their treenode address is underspecified:

(5) *ADJUNCTION: Introducing an unfixed node

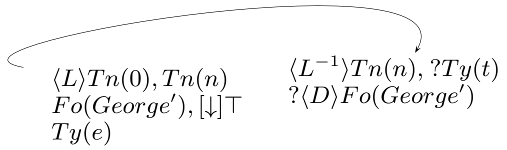
$Tn(n), ?Ty(t)$

$\langle\uparrow^*\rangle Tn(n)$,
$?Ty(e)$,
$?\exists \mathbf{x}.Tn(\mathbf{x}), \diamondsuit$

The above rule is introducing an unfixed node. It is structurally underspecified, since it does not carry a fixed treenode address (noted with the requirement $?\exists \mathbf{x}.Tn(\mathbf{x})$, a requirement to obtain a treenode address). The only thing w.r.t to its position it knows is that somewhere up above or at the current node, the address *Tn(n)* must be found. To give an example of where unfixed nodes will be used consider left dislocated structures in English like "John, I know". In this case, the dislocated NP is first parsed on an unfixed node and is only later resolved in the object position, once more information is obtained from parsing the rest of the utterance. I cannot go into more detail here as regards the use of unfixed nodes in dislocated structures, but the interested reader is directed to Kempson et al. (2001); Cann et al. (2005a); Chatzikyriakidis (2010); Kempson and Kiaer (2010); Gregoromichelaki (2013) for more information about dislocation in particular, and the use of unfixed nodes in general.

Besides the tree structures in which each sentence involves a single tree (regardless of tree embedding), DS also makes use of pairs of trees which are linked to each other via a relation called LINK. LINK structures involve two separate tree structures. The node from which the LINK starts can be seen as setting the context in which the LINKed tree is going to be parsed. Examples of LINK relations include relative clauses, in which case the relative clause is parsed within the context of the head noun or Hanging Topic Left Dislocation (HTLD) constructions in which case the HTLD sentence is parsed within the context of having parsed the left-dislocated element first:

(6) George, I know him



A similar treatment has been proposed for Right Dislocation, the difference being that the LINK structure is now initiated from a type t complete node, i.e. a complete proposition. This idea has been used in the DS literature for BRD, with particular emphasis to pronoun doubling and clitic right dislocation in clitic languages like e.g. Greek (Cann et al., 2005b; Chatzikyriakidis, 2010). We will see that this idea is not enough to capture the idiosyncrasies of ATs. To this, we have to look at the way fragment answers and in general dialogue modeling is done in DS.

2.2 Split Utterances and Fragment Answers in Dynamic Syntax

There is a substantial body of work on formal Dialogue Modeling using DS. Here, we will mention some of the DS literature relevant for the needs of this paper, in particular papers that model split utterances and fragment answers. Two classic examples discussed in a number of papers, e.g. Purver et al. (2010); Kempson et al. (2011, 2012, 2016), are the ones shown below:

(7) A: Did you burn? B: Myself? No.

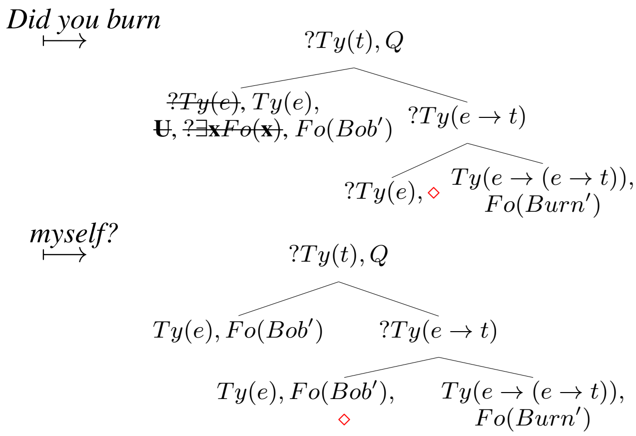
(8) Who hit Mary? John.

What is problematic in the first example, is that the full sentence arising out of the conjunction of the two utterances is ungrammatical, while perfectly fine in a dialogue setting. A formal model of syntax has to be able to accommodate these types of data as well. In DS, production and parsing work tightly together, and the same mechanisms are used in both. The only difference between the two is that during production there is also a subsumption check against a goal tree in every step of the derivation (Otsuka and Purver, 2003; Gregoromichelaki et al., 2012; Eshghi et al., 2011). At any point in the parsing process, the interlocutors can switch the roles of parser and producer at any time. Assuming the following lexical entry for the reflexive, it suffices to have an account of the problematic example:

myself **IF** $\langle \uparrow_0 \rangle \langle \uparrow_*^1 \rangle \langle \downarrow_0 \rangle Fo(x)$
$Speaker(x)$
THEN $\texttt{Substitute}(\mathbf{U}, x)$
ELSE ABORT

The instructions presented in the lexical entry in this simple algorithmic format copy a formula from a local co-argument node onto the current node. This formula must satisfy the conditions set by the person and number of the uttered reflexive (naming the speaker). The result of parsing the split utterance in (7) is shown below:

(9)



We see two trees. The first tree is the partial tree after the parse of *did you burn?*. A value has been provided for the metavariable U projected by the second person pronoun *you* (acting as content placeholders to be resolved later, and projected by the lexical entries of pronominals). This is basically a value identifying the hearer. The interlocutor can take on this structure and continue with *myself* with no problem. This is because the speaker in this turn was the hearer in the previous utterance. Given the lexical entry for *myself*, the value provided by *you* by the first participant to identify the hearer, can now be copied to the object node.

Lastly, let us look at (8), a fragment answer example. This proceeds as follows: the fragment answer is parsed within the context of the WH question, on a LINKed structure. Remember that the structure where the LINK starts can be seen as setting the context for the structure in LINK:

(10) Before parsing the fragment answer

$Ty(t), Fo(upset'(WH)(Mary'))Q$

$Ty(e), Fo(Mary')$ $\quad$ $Ty(e \to t), Fo(upset'(WH))$

$Ty(e), Fo(WH),$ $\quad$ $Ty(e \to (e \to t)),$ $Fo(upset')$

$\langle L^{-1}\rangle Tn(0),$
$?Ty(e)$
$\diamond$

The fragment *John* can be now parsed on the LINKed tree which expects a formula of type e:

(11) Parsing the fragment and updating the WH metavariable to John

$Ty(t), Tn(0), Fo(upset'(WH)(Mary'))Q$

$Ty(e), Fo(Mary')$ $\quad$ $Ty(e \to t), Fo(upset'(WH))$

$Ty(e), \cancel{Fo(WH),}$ $Fo(John')$ $\quad$ $Ty(e \to (e \to t)),$ $Fo(upset')$

$\langle L^{-1}\rangle Tn(0),$
$Ty(e), Fo(John')$
$\diamond$

3 Afterthoughts as Fragment Answers to Implicit Questions

The account I want to pursue, as already mentioned, is one where ATs are seen as fragment answers to implicit questions. I will argue that by making this assumption, one can have a straightforward account of ATs that also predicts its syntactic idiosyncrasies. One notational issue: in what follows, I will not be showing the LINK transition between the WH question and the fragment answer as this was done in (11), but rather show the main tree after substitution the WH metavariable has been done. For example, the structure in (11) will be represented as:

(12) Parsing the fragment and substitution

$Ty(t), Tn(0), Fo(upset'(John')(Mary'))Q$

$Ty(e), Fo(Mary')$ $\quad$ $Ty(e \to t), Fo(upset'(John'))$

$Ty(e), \cancel{Fo(WH),}$ $Fo(John'), \diamond$ $\quad$ $Ty(e \to (e \to t)),$ $Fo(upset')$

Let us start with a simple AT example:

(13) I know her... Ruth Kempson

The first step is to parse up to the point of the AT, i.e. we parse "I know her":

Parsing "I know her"

$?Ty(t)$

$Ty(e)$ $Fo(V'_{speaker})$ $\quad$ $?Ty(e \to t)$

$Ty(e), Fo(U_{female}), \diamond$ $\quad$ $Ty(e \to (e \to t))$ $Fo(know')$

At that point the AT comes into play. Assuming that this is an answer to an implicit question, the sentence parsed/produced so far is turned into a WH-question. In our case, the only difference is the substitution of the U metavariable with a WH metavariable. The AT is then parsed on a LINK structure connected with the main structure, provides a type e value, which is then copied to the main structure, substituting the WH metavariable with a proper value (RK'):

Parsing the AT

$Ty(t), know'(RK')(Stergios')$

$Ty(e)$ $Fo(V'_{speaker})$ $\quad$ $Ty(e \to t)$ $Fo(know'(RK'))$

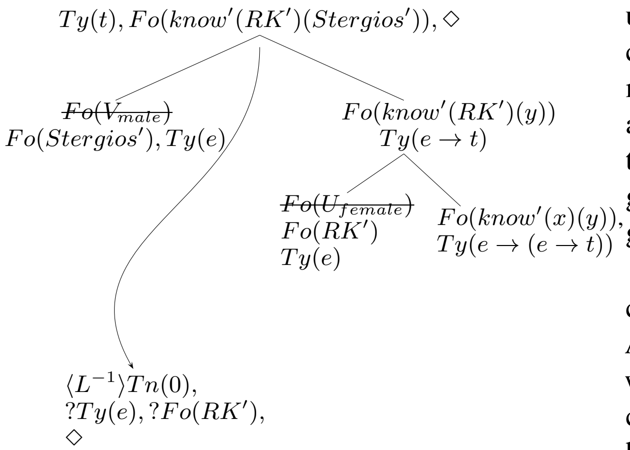
$Ty(e), \cancel{Fo(WH_{female})}$ $Fo(RK')$ $\quad$ $Ty(e \to (e \to t))$ $Fo(know')$

$Ty(e), Fo(RK')$

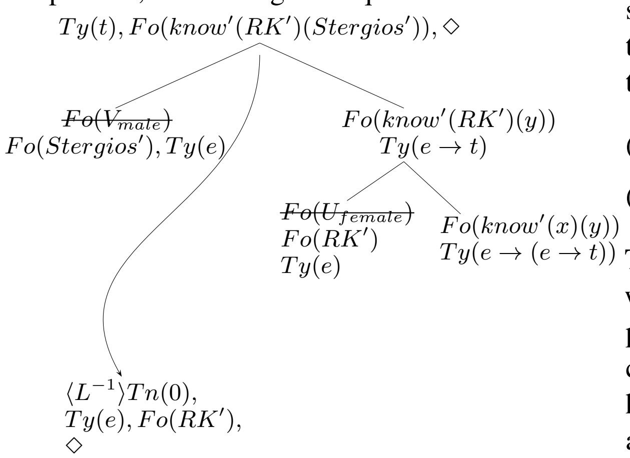
This is the general idea of how ATs function. To recap: ATs are taken to be a corrective mechanism, and as such are assumed to be answers to implicit clarificatory questions. A similar treatment to fragment answers can be used in the case of ATs. A framework that has the ability to handle fragment answers, should be able to handle ATs as well. In our case, we have exemplified this using the DS framework. The next question is whether this account makes the correct predictions as regards the behaviour of ATs in general, but also w.r.t. its differences with regular BRD structures. To this, we turn now.

3.1 Afterthoughts and Backgrounded Right Dislocations

What is the difference between regular right dislocated structures, usually referred to as BRDs, and ATs? Well, in terms of their semantic import, as we have already seen, BRDs function as content re-establishers, whereas ATs is a clarification device. How is this to be reflected in the analysis? Well, first of all BRDs do not involve any implicit questions, they are not parsed in the context of a clarificatory question. The way these structures have been handled in DS assume that a LINK relation is projected from a type t complete tree to a tree that has a requirement that a copy of one of the formulas in the main tree are found on the LINKed one. Let us explain with an example. We look at the same example 'I know her, Ruth Kempson', but on the BRD interpretation (with comma intonation). If BRDs are content re-establishers, what we have here is an optional element that re-establishes part of the content of the sentence 'I know her'. We first parse the sentence 'I know her' and then connect it via LINK to a tree that requires a copy of one of the formulas to be found in that tree, in our case RK':



The main tree has a complete formula that is the result of substituting the metavariables projected by the pronouns with proper values, RK' and $Stergios'$ respectively. There is a requirement for a formula value RK' to be found on the LINKed tree. This is exactly what the RD 'Ruth Kempson' will provide, eliminating the requirement:



Let us start with strict morphological agreement: ATs do not require it, BRDs do. Averintseva-Klisch (2008a) claims that this is the case at least for gender agreement, but does not give any other examples of morphological mismatch. We will concentrate on the gender mismatch case. Let us have a look at an example Averintseva-Klisch (2008a) discusses:

(14) Ich habe ihn$_i$ vorhin gesehen... das Kleine$_i$ von der Nachbarn
I have him$_{MASC}$ before seen, the little-one$_{NEUTR}$ of the neighbours

Our account of ATs predicts these gender mismatches quite naturally in the following sense: assuming that ATs are answers to clarification questions, then the relevant WH element in German in the above case is *Wen*. However, *wen* is gender neutral in the grammatical sense, i.e. it is compatible with any gender as a response. Thus, a proper update to the WH metavariable projected by *wen* can be in any gender, a fact that gives rise to gender mismatches. On the other hand, such mismatches are not possible in BRD constructions, given that the pronoun *ihn* will provide a masculine value for gender, that will be incompatible with any other grammatical gender value.

The next difference between BRDs and ATs concerns free positioning in the clause/utterance. ATs can appear freely within the utterance, whereas BRDs are restricted to the end of the clause. Explaining why BRDs exhibit this behaviour is easy: the assumption for BRDs, at least in the way these are handed in DS, is that they involve a LINK relation between a type t complete tree and a tree which needs a copy of one of the formulas in the complete tree. Details aside, the idea is that an utterance has to be considered in some way final, in the sense of providing all the necessary means to provide a full propositional structure, before the RD is parsed in BRDs. Consider the contrast below:

(15) *She, Ruth Kempson, is here

(16) She... Ruth Kempson, is here

The BRD interpretation is not possible because when the RD comes into parse there is no complete structure to project the LINK from. In the case of the AT, the situation is different. What happens there is that the pronoun *she* gets updated and is turned into a clarificatory question. In terms of representation, what happens is that a regular metavariable, is turned into a WH metavariable, and eventually gets updated to the value RK' after *Ruth Kempson* is parsed. The parse can proceed as usual from there. The three steps are shown below:

(17) Parsing the strong pronoun *she* in (16)

$$?Ty(t), Tn(n)$$

$$\langle\uparrow^*\rangle Tn(n),\; Ty(e), Fo(U_{female'}),\; ?\exists\mathbf{x}.Tn(\mathbf{x}), \exists\mathbf{x}.Fo(\mathbf{x}), \diamond$$

(18) Clarification question formation

$$?Ty(t), Tn(n)$$

$$\langle\uparrow^*\rangle Tn(n),\; Ty(e), Fo(WH),\; ?\exists\mathbf{x}.Tn(\mathbf{x}), \exists\mathbf{x}.Fo(\mathbf{x}), \diamond$$

(19) Parsing 'Ruth Kempson' within the context of the clarificatory question

$$?Ty(t), Tn(n)$$

$$\langle\uparrow^*\rangle Tn(n),\; Ty(e), Fo(RK'),\; ?\exists\mathbf{x}.Tn(\mathbf{x}), \diamond$$

Regarding the possibility of optional additions like *I mean*, *Ich meine* in German, the explanation seems to be straightforward under the proposed account, as well. Whatever our formal analysis is here for questions of the sort *who do you mean?*, will extend to our treatment of ATs with this type of additions. Naturally, there is no way for such optional structures to appear in BRDs, given our account of BRDs.

3.2 Specificational ATs

Specificational ATs are different to the type of ATs which we have been dealing with so far, and usually called identificational. The two structures are shown below, (20) a specificational AT and (21) an identificational AT:

(20) I met a hollywood star... John Travolta

(21) I know her... Ruth Kempson

The same account provided so far can be used for specificational ATs, albiet with a minor difference: the implicit question in the case of specificational ATs will not involve a bare WH metavariable but a restricted WH metavariable. For (20) this will be the WH 'which hollywood star'. Thus, the context of the WH question will be the following before the AT is processed in (20):[3]

(22) Tree as context

$$Ty(t), Fo(met'(WH_{(\epsilon,x,hs'(x))})(Stergios'), \diamond$$

$$Ty(e), Fo(Stergios') \qquad Ty(e \rightarrow (e_s \rightarrow t)), Fo(met(WH_{(\epsilon,x,hs'(x))}))$$

$$Ty(e), Fo(WH_{(\epsilon,x,hs'(x))}) \qquad Ty(e \rightarrow (e \rightarrow t)), Fo(met')$$

The subscript on the WH metavariable says that the value that will update the WH metavariable will basically substitute the x metavariable in the epsilon calculus formula $\epsilon, x, hs'(x)$. Thus, the AT is parsed within this context and provides the substitution for x: [4]

(23) After parsing the AT 'John Travolta'

$$Ty(t), Fo(met(hs'(JT'))(Stergios'), \diamond$$

$$Ty(e), Fo(Stergios') \qquad Ty(e \rightarrow t), Fo(met'(Fo(hs'(JT')))$$

$$Ty(e), Fo(hs'(JT')) \qquad Ty(e \rightarrow (e \rightarrow t)), Fo(met')$$

3.3 Afterthoughts and Recursion

Recursion is allowed w.r.t. ATs, i.e. more than one AT is possible in an utterance as witness the example below:

(24) I met her... Mary... yesterday

Assuming that ATs is a corrective strategy, this is to be expected if more than one aspect of the utterance needs to be further clarified. The account we have proposed here, which is based on the idea that ATs are basically fragment answers to clarification questions predicts this behavior of ATs. In order

[3] We use the epsilon calculus in the restriction. We cannot really go into details about the epsilon calculus here. It suffices to say that the epsilon calculus is a quantifier free system invented by (Hilbert and Bernays, 1939) and one can derive from the formula $(\epsilon, x, hs'(x))$ the formula $(\exists x.hs'(x))$ in predicate logic.

[4] JT stands for *John Travolta*.

to discuss this example, we will have to make use of the situation/event node. This is the treenode where all tense/aspect information is assumed to be encoded in in DS. I have not been using it so far for reasons of simplicity, since it bore no difference to the actual account so far. However, it is needed for the example we are interested in. Let us see how this works. The tree below depicts the structure after the first AT (the details of how we reach this point are the same as with (13)):

(25) Parsing *I met her... Mary*:

- $Ty(t), Fo(met(Mary')(Stergios')(s_i', s_i' \subseteq \mathbf{R} \wedge \mathbf{R} < s_{now})), \diamond$
  - $Ty(e_s)$ $Fo(\epsilon, s_i', s_i' \subseteq \mathbf{R}$ $\wedge \mathbf{R} < s_{now})$
  - $Ty(e_s \rightarrow t)$ $Fo(met'(Mary)(Stergios'))$
    - $Ty(e)$, $Fo(Mary')$
    - $Ty(e \rightarrow (e_s \rightarrow t))$, $Fo(met'(Mary'))$
      - $Ty(e)$ $Fo(RK')$
      - $Ty(e \rightarrow$ $(e \rightarrow (e_s \rightarrow t)))$ $Fo(met')$

The extra situation argument node is of type e_s (s for situation) and encodes the relevant tense/aspect information. In the case of the simple past the situation is identified as a past situation. It is subsumed inside an interval R that is located in the past ($s_i' \subseteq \mathbf{R} \wedge \mathbf{R} < s_{now}$). Note that the interval is a metavariable, thus can be updated, should there be more specific information on the interval. What happens in the case of the second AT 'yesterday', is that the metavariable **R** is first updated to a WH metavariable ('when'):

(26) Clarification question *when did you meet Mary?*:

- $Ty(t), Fo(met(Mary')(Stergios')$ $(s_i', s_i' \subseteq WH_t \wedge WH_t < s_{now})), \diamond$
  - $Ty(e_s)$ $Fo(\epsilon, s_i', s_i' \subseteq WH_t$ $\wedge WH_t < s_{now})$
  - $Ty(e_s \rightarrow t)$ $Fo(met'(Mary)(Stergios'))$
    - $Ty(e)$, $Fo(Mary')$
    - $Ty(e \rightarrow (e_s \rightarrow t))$, $Fo(met'(Mary'))$
      - $Ty(e)$ $Fo(RK')$
      - $Ty(e \rightarrow$ $(e \rightarrow (e_s \rightarrow t)))$ $Fo(met')$

Parsing the AT will substitute the WH metavariable WH_t with a proper time interval value, noted here as t_{ystrd}:

(27) Parsing the second AT *yesterday*:

- $Ty(t), Fo(met(Mary')(Stergios')$ $(s_i', s_i' \subseteq t_{ystrd} \wedge t_{ystrd} < s_{now})), \diamond$
  - $Ty(e_s)$ $Fo(\epsilon, s_i', s_i' \subseteq t_{ystrd}$ $\wedge t_{ystrd} < s_{now})$
  - $Ty(e_s \rightarrow t)$ $Fo(met'(Mary)(Stergios'))$
    - $Ty(e)$, $Fo(Mary')$
    - $Ty(e \rightarrow (e_s \rightarrow t))$, $Fo(met'(Mary'))$
      - $Ty(e)$ $Fo(RK')$
      - $Ty(e \rightarrow$ $(e \rightarrow (e_s \rightarrow t)))$ $Fo(met')$

4 Conclusions and Future Work

In this paper I have discussed the case of afterthoughts from the perspective of dialogue modelling. In particular, I have argued that a natural explanation of afterthoughts and their syntactic/semantic properties can be provided once we make the assumption that ATs are answers to clarification questions. I have provided an implementation of this idea in Dynamic Syntax and have shown that a couple of the properties associated with afterthoughts, like morphological mismatches, recursion, free position in the utterance and optional additions.

The next step we want to take is to have a look at the issue of CRification in the sense of Ginzburg (2012) and its potential connection with ATs. In general, everything seems to be clarified in dialogue, and this is what our preliminary data indicate about ATs. If this is true, this will turn out to be a further confirmation that the account is on the correct track. A related issue to explore is the connection between ATs and overanswering.

On a more general level, it would be very interesting to check whether ideas coming from the literature on dialogue, can shed light to phenomena that have been considered difficult to handle in traditional syntactic/semantic formalisms.

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References

Maria Averintseva-Klisch. 2008a. to the right of the clause. *Right Dislocation vs. Afterthought . En: C. Fabricius-Hansen, W. Ramm (ed.): Subordination* *versus Coordination in Sentence and Text. Amsterdam: Benjamins*, pages 217–239.

Maria Averintseva-Klisch. 2008b. German right dislocation and afterthought in discourse. *Pragmatics and Beyond Series*, 172:225.

Miriam Bouzouita. 2008. At the syntax-pragmatics interface: clitics in the history of spanish. In R. Cooper and R. Kempson, editors, *Language in Flux: Dialogue Coordination, Language Variation, Change and Evolution*, pages 221–264. College Publications, London.

Ronnie Cann, Tami Kaplan, and Ruth Kempson. 2005a. Data at the grammar-pragmatics interface: the case of resumptive pronouns in English. *Lingua*, 115(11):1475–1665. Special Issue: On the Nature of Linguistic Data.

Ronnie Cann, Ruth Kempson, and Lutz Marten. 2005b. *The Dynamics of Language*. Elsevier, Oxford.

Wallace Chafe. 1988. Linking intonation units in spoken english. *Clause combining in grammar and discourse*, 1:27.

S. Chatzikyriakidis. 2010. *Clitics in four Dialects of Modern Greek: A Dynamic Account*. Ph.D. thesis, King's College, London.

Stergios Chatzikyriakidis. 2017. Afterthoughts in greek: Gender mismatches under a dynamic framework 1. *Journal of Linguistics*, 53(2):279–325.

Mark De Vries. 2007. Dislocation and backgrounding. *Linguistics in the Netherlands*, 24(1):235–247.

A. Eshghi, C. Howes, E. Gregoromichelaki, J. Hough, and M. Purver. 2015. Feedback in conversation as incremental semantic update. In *Proceedings of the 11th International Conference on Computational Semantics (IWCS 2015)*, London, UK. Association for Computational Linguisitics.

A. Eshghi, M. Purver, and Julian Hough. 2011. Dylan: Parser for dynamic syntax. Technical report, Queen Mary University of London.

Arash Eshghi, Julian Hough, Matthew Purver, Ruth Kempson, and Eleni Gregoromichelaki. 2012. Conversational interactions: Capturing dialogue dynamics. In S. Larsson and L. Borin, editors, *From Quantification to Conversation: Festschrift for Robin Cooper on the occasion of his 65th birthday*, volume 19 of *Tributes*, pages 325–349. College Publications, London.

Jonathan Ginzburg. 2012. *The Interactive Stance: Meaning for Conversation*. Oxford University Press.

E. Gregoromichelaki, R. Kempson, and R. Cann. 2012. Language as tools for interaction: Grammar and the dynamics of ellipsis resolution". *Linguistic Review*, 29(4):563–584.

Eleni Gregoromichelaki. 2013. Clitic left dislocation and clitic doubling: A dynamic perspective on left-right asymmetries in greek. *Rightward movement in a comparative perspective. Amsterdam: John Benjamins*.

Eleni Gregoromichelaki, Yo Sato, Ruth Kempson, Andrew Gargett, and Christine Howes. to appear. Dialogue modelling and the remit of core grammar. In *Proceedings of IWCS 2009*.

David Hilbert and Paul Bernays. 1939. *Grundlagen der Mathematik II*. Julius Springer, Berlin.

R. Kempson, E. Gregoromichelaki, and S. Chatzikyriakidis. 2012. Joint utterances in greek and english: implications for linguistic modelling. In *Proceedings of the 33rd Annual Meeting of the Department of Linguistics of Aristotle University*, pages 107–129.

R. Kempson, E. Gregoromichelaki, Wifried M.V, M. Purver, G. White, and R. Cann. 2011. Natural-language syntax as procedures for interpretation: the dynamics of ellipsis construal. In A. Lecomte and S. Tronçon, editors, *Ludics, Dialogue and Interaction*, number 6505 in Lecture Notes in Computer Science, pages 114–133. Springer-Verlag, Berlin/Heidelberg.

R. Kempson and J. Kiaer. 2010. Multiple long-distance scrambling: Syntax as reflections of processing. *Journal of Linguistics*, 46(01):127–192.

Ruth Kempson, Ronnie Cann, Eleni Gregoromichelaki, and Stergios Chatzikyriakidis. 2016. Language as mechanisms for interaction. *Theoretical linguistics*, 42(3-4):203–276.

Ruth Kempson, Wilfried Meyer-Viol, and Dov Gabbay. 2001. *Dynamic Syntax: The Flow of Language Understanding*. Blackwell.

Lutz Marten and Hannah Gibson. 2015. Structure building and thematic constraints in Bantu inversion constructions. *Journal of Linguistics*, 52(3):565–607.

Masayuki Otsuka and Matthew Purver. 2003. Incremental generation by incremental parsing. In *Proceedings of the 6th CLUK Colloquium*, pages 93–100, Edinburgh. CLUK.

Dennis Ott and Mark de Vries. 2014. A biclausal analysis of right-dislocation. In *Proceedings of NELS*, volume 43, pages 41–54.

Matthew Purver, Eleni Gregoromichelaki, Wilfried Meyer-Viol, and Ronnie Cann. 2010. Splitting the 'I's and crossing the 'You's: Context, speech acts and grammar. In *Aspects of Semantics and Pragmatics of Dialogue. SemDial 2010, 14th Workshop on the Semantics and Pragmatics of Dialogue*, pages 43–50, Poznań. Polish Society for Cognitive Science.

Tohru Seraku. 2013. *Clefts, Relatives, and Language Dynamics: The Case of Japanese*. Ph.D. thesis, University of Oxford.