Dialogue-Grammar Correspondence in Dynamic Syntax

Ruth Kempson[1], Andrew Gargett[1], Eleni Gregoromichelaki[1], Chris Howes[2], and Yo Sato[2]

[1] King's College London, Strand, London WC2R 2LS, UK
[2] Queen Mary University of London, Mile End Road, London E1 4NS, UK
{ruth.kempson,andrew.gargett,eleni.gregor}@kcl.ac.uk
{chrizba,yosato}@dcs.qmul.ac.uk

Abstract. In this paper we argue, contra a trend to classify fragments in terms of sub-types specific to dialogue, that despite their diversity of usage in conversation, such ellipses are analysable in terms of general structure building mechanisms for interpretation growth that have motivation elsewhere in the grammar. The framework adopted is *Dynamic Syntax* (DS, Kempson et al. (2001); Cann et al. (2005)). The fragment types addressed include *reformulations*, *clarification requests*, *extensions*, *corrections* and *acknowledgements* which receive analyses that do not extend the basic apparatus of the model. We argue that incremental use of fragments serves a specific role in dialogue, namely, a means of incrementally narrowing down the otherwise mushrooming structural/interpretational alternatives, a problem known to constitute a major challenge to any parsing system. We conclude that a grammar with inbuilt parsing dynamics can explain dialogue phenomena without constituting a grammar of conversation. On the other hand, these results contribute to the general programme pursued by DS of providing a unitary basis for characterising all elliptical phenomena as indeed context-dependent interpretation fixing; in our view, this becomes possible if a grammar formalism is adopted in which ”syntax” is defined as the progressive building up of representations of content reflecting real-time processing.

1 Introduction

In confronting the challenge of providing formal models of dialogue, with its plethora of fragments and rich variation in modes of context-dependent construal, it might seem that linguists face two types of methodological choice. Either (a) conversational dialogue demonstrates dialogue-specific mechanisms, for which a grammar specific to such activity must be constructed; or (b) variation arises due to the employment of independent parsing/production systems which are nevertheless based on some mode-neutral grammar formalism. However, as dialogue research continues to develop, there are intermediate possibilities, and in this paper we discuss the approach developed within *Dynamic Syntax* (*DS*, Kempson et al. 2001, Cann et al. 2005), a grammar framework within which, not only the parser, but indeed "syntax" itself is seen as the progressive construction of semantic representations set in context. Here we extend the analyses presented in Kempson et al. (2007) to a range of further fragment types, in particular *reformulations*, *fragment requests* and *corrections* accompanied by *extensions*. From a DS perspective, such apparently dialogue-specific constructions can be seen to result from perfectly general structural processes, despite being characteristic of cross-party conversational data.

Further, we claim that the grammar itself constitutes the basis for parsing strategies that facilitate efficient online processing, structural and semantic. In this respect, the DS dialogue model provides the means of achieving this DURING the course of the sub-sentential construction process, demonstrating that timely application of such generally available "syntactic" mechanisms directly contributes to the human processor's high degree of success in linguistic interaction. We conclude that, contrary to conventional assumptions of the grammar-parser relation whereby exclusively the parser handles disambiguation, grammars, as employed in dialogue, can also be seen as restricting ambiguity provided their formal specification can model this incremental facilitating function.

2 Background

The data we focus on are non-repetitive fragment forms of acknowledgements, clarifications and corrections (henceforth, A female, B male):

(1) A: Bob left.
B: (Yeah,) the accounts guy.

(2) A. They X-rayed me, and took a urine sample, took a blood sample.
A: Er, the doctor
B: Chorlton?
A: Chorlton, mhm, he examined me, erm, he, he said now they were on about a slight [shadow] on my heart. [BNC: KPY 1005-1008]

(3) A: Are you left or
B: Right-handed.

(4) A: Bob left.
B: Rob?
A: (No,) (Bob,) the accounts guy.

Even though the NP fragments in (2) - (4) might be characterised as distinct constructions, they illustrate how speakers and hearers may contribute to the joint enterprise of establishing some shared communicative content, in what might be loosely called *split utterances*. Even (1), an *acknowledgement*, can be seen as such, being similar in form to an afterthought *extension* which, instead of being uttered by the same speaker, is combined with an interlocutor's sentential utterance. As (2) shows, joint construction of content can proceed incrementally: B provides a *reformulation* as a *clarification request*, resolved by A within the construction of a single proposition. The attested example in (3) represents an intermediate case, in which the respondent realising what the question is answers AS the *completion* of the question, with the fragment serving both as *question* and *answer*. In (4), the fragment, *the accounts guy*, is a *correction* of B's understanding of A's utterance, illustrating how A and B are having to negotiate in order to secure coordination. Nevertheless such corrections can be also *extensions* in the above sense, providing a single conjoined propositional content DURING which coordination is achieved. At the same time, the fragment also constitutes an *answer* to B's question.

It might seem that such illustration of diversity of fragment uses is ample evidence of the need for conversation-specific rules as part of a grammar. Indeed, this is the view taken by Ginzburg and Sag (2000), Purver (2004), Ginzburg and Cooper (2004), Fernández (2006) a.o. Fernández (ibid) presents a thorough taxonomy, as well as detailed formal and computational modelling of *Non-Sentential Utterances* (NSUs), referring to contributions such as (1) as *repeated acknowledgements* involving *reformulation*. Since such fragments require contextual information singling out a particular constituent of the previous utterance, Fernández models such constructions via type-specific “accommodation rules” which make a constituent of the antecedent utterance “topical”. The semantic effect of the acknowledgement is then derived by applying an appropriately defined utterance type for such fragments to the newly constructed context. A distinct form of contextual accommodation is employed to model so-called *helpful rejection* fragments, as in (4) (without the reformulation), whereby a *wh*-question is accommodated in the context by abstracting over the content of one of the sub-constituents of the previous utterance. The content of the rejection is derived by applying this *wh*-question in the context to the content of the fragment (see also Schlangen (2003) for another classification and analysis).

The alternative explored here is whether phenomena such as (1)-(2), both of which are non-repetitive appositional next-speaker contributions, can be handled using the same mechanisms for structure-building made available in the core grammar without recourse to conversation-specific extensions of that grammar and contextual accommodation rules. The range of interpretations these fragments receive in actual dialogue seem to form continua with no well-defined boundaries and mixing of functions (see (3)-(4) and comments in Schlangen (2003)). Thus we propose that the grammar itself simply provides mechanisms for processing and integrating such fragments in the current structure whereas the precise contribution of such fragments to the communicative interaction is either calculated by pragmatic inferencing (as in e.g. Schlangen (2003)) or, as seems most often to be the case, left underspecified. The framework for the analysis is Dynamic Syntax, in which the dynamics of how information accrues in language processing is the core syntactic concept.

One bonus of the stance taken here is its elucidation of the grammar-parser contribution to disambiguation and antecedent resolution. Part of the challenge of modelling dialogue is the apparent multiplicity of interpretive and structural options opened up during processing by the recurrent, often overlapping fragments as seen in (2) above. Due to context-dependence, successful integration of such fragments could be taken to significantly increase the complexity of the interpretive task. If grammar is separated from parsing, either accommodation and construction-specific interpretation rules or a module separate from grammar dedicated to the resolution of context dependency seem to be inevitable. However, the alternative is to see such phenomena as exploitation by interlocutors of the incrementality afforded by the grammar to manage the potential explosion of options. The employment of fragments with different functions enable the interlocutors to immediately address problems arising during the (sub-sentential) processing of a previous utterance, at any relevant point, thereby enabling them to jointly constrain interpretation choices in an ongoing way. Processed in a specific context and relying on this particular context for their interpretation, such fragments do not therefore increase the complexity of the interpretive task but rather facilitate it. Modelling the flexibility of fragment interpretation requires fine-grained control of how the current utterance can be combined with previous contextual (potentially partial) information, provided potentially by another interlocutor. Such control is not available in frameworks in which context dependency of linguistic processing is outside the remit of the grammar or where parsing and generation are independently defined. In such frameworks distinct mechanisms have to be set up accordingly to take care of the fragmented nature of dialogue. However, the tight coordination of parsing and generation defined in *Dynamic Syntax* (Purver et al. (2006)) provides a straightforward basis for how the context-dependence of both tasks allows participants to economise on processing and achieve coordination effectively.

3 Dynamic Syntax: A Sketch

Dynamic Syntax (*DS*) is a parsing-based approach to linguistic modelling, involving strictly sequential interpretation of linguistic strings. The model is implemented via goal-directed growth of tree structures and the annotations on their nodes (*decorations*). Tree development is formalised using *LOFT* (Blackburn and Meyer-Viol (1994)), with modal operators $\langle\uparrow\rangle, \langle\downarrow\rangle$ defining concepts of *mother* and *daughter*, their iterated counterparts, $\langle\uparrow_*\rangle, \langle\downarrow_*\rangle$, defining the notions *be dominated by* and *dominate*. *Underspecification* and update are core aspects of the grammar and involve strictly monotonic information growth for any dimension of tree structures and decorations. Underspecification is employed at all levels of tree relations (mother, daughter etc.), as well as formulae and type values, each with a *requirement* driving the goal-directed process of update. For example, a node of a tree may have a requirement expressed in DS with the decoration $?Ty(e)$, for which the only legitimate updates are logical expressions of individual type ($Ty(e)$); but requirements may also take a modal form, e.g. $?\langle\uparrow\rangle Ty(e \rightarrow t)$, a restriction that the mother node be decorated with a formula of predicate type. Requirements are essential to the DS dynamics: all requirements must be satisfied if the construction process is to lead to a successful outcome.

Structure is built from lexical and general *computational actions*. Computational actions govern general tree construction processes (introducing/updating structure) and compiling interpretation (introducing/updating decorations for a mother node once the daughters' requirements have been satisfied). This may include the construction of only weakly specified tree relations, with nodes (*unfixed nodes*) characterised simply as dominated by some node from which they are constructed, with subsequent update required to fix the exact position of the node in the tree (unlike van Leusen and Muskens (2003), partial trees are here part of the model). Individual lexical items also provide actions for building structure, *lexical actions*, expressed in exactly the same terms as the more general processes, inducing nodes and decorations. Thus *partial trees* grow incrementally driven by procedures associated with words as encountered, with a *pointer*, $\diamondsuit$, recording the parse progress and hence handling word order restrictions (DS trees do not reflect word order as they are strictly representations of content).

Complete individual trees are taken to correspond to predicate-argument structures. More complex structures can be obtained via a general tree adjunction operation defined to license the construction of a tree sharing some term with another newly constructed tree, yielding so-called LINKED TREES (Kempson et al. 2001). The resulting combined information from the adjoined trees is modelled as a conjunction of terms at the node FROM which the link is made. Importantly, adjunction, as other forms of construction and update, can be employed to model how subsequent speakers may dynamically provide fragmentary extensions in response to the previous utterance.

Content underspecification, an obvious property of anaphoric expressions but also affecting many other types of lexical items is modelled uniformly in DS as the provision of initially weak specifications that need to be enriched by means of update in a context. The content underspecification of pronouns is represented as the initial provision of a place-holding metavariable, noted as e.g. **U**, plus an associated requirement for update by an appropriate term value: $?\exists\mathbf{x}.Fo(\mathbf{x})$. Similarly, *names* are represented as initially introducing place-holders associated with a constraint providing the name of the individual entity picked out. For example, the name *Bill* contributes the decoration $\mathbf{U}_{Bill'(\mathbf{U})}, Ty(e)$. The subscript specification is shorthand for a transition across a LINK relation to a tree whose top node is decorated with a formula $Bill'(\mathbf{U})$, the name being taken as a predicate or name specification of individuals thus restricting possible updates to the metavariable[3]. Names can thus be seen as a procedure for identifying the individual being talked about, with a logical constant (e.g. $m21$, $m23$ etc. picking out uniquely this individual) eventually replacing the metavariable on the emergent tree. According to the DS account, all content underspecification is resolved by substitution, the update of metavariables, which can only be accomplished if the context contains an appropriate term as substituend. *Context* in DS involves storage of *parse states*, i.e., the storing of partial tree, word sequence to date, plus the actions used in building up the partial tree.

A major aspect of the DS dialogue model is that both *generation* and *parsing* are goal-directed and incremental, with parsing as the underlying mechanism and generation parasitic on it. A hearer builds a succession of partial parse trees in order to achieve an interpretation of the speaker's message. A speaker is modelled in DS as doing exactly the same except (s)he also has available a *goal tree* representing what they wish to say. Each possible step in generation, an utterance of a word, is governed by whatever step is licensed by the *parsing* formalism, constrained via the required *subsumption* relation of the goal tree by the thus-far constructed "parse" (partial) tree. Speakers produce a natural language string by associating this growing "parse" tree incrementally with appropriate lexical items.

Now, dialogue requires taking into account both the speaker's goal tree (a thought to be expressed) and the speaker's parse tree (what licenses the utterance of the next word by checking the subsumption of the goal tree). In addition the hearer's parse tree (what (s)he has processed) must be taken into account because in cases of miscommunication it will diverge from the one the speaker is constructing. These, potentially partial, parse trees are stored in the context at all stages and are updated as utterance parts are incrementally processed. For fragment construal, we are interested in the extent to which B has successfully parsed what A has said, i.e., the matching of their partial parse trees. Even with only partial parse trees, the model allows at any stage switching of speaker/hearer roles in order to interrupt to clarify, reformulate, or correct, by either repeating some expression heard or producing an alternative. It is assumed that the parse tree of B as a hearer might diverge from A's only at a node where need of clarification or miscommunication occurs. In such cases, a sub-routine developing it can then be initiated by B now becoming the generator. Notice that because of the incremental nature of DS, B can reuse the already constructed (partial) parse tree in their context, thereby starting at this point, rather than having to rebuild an entire propositional tree or subtree (e.g. of type e). This is licensed only if B's (partial) goal tree matches or extends a parse tree in his context which was updated with the relevant subpart of what B took to be A's utterance. Indeed, this update is what B is seeking to clarify, correct or acknowledge. A, now as a hearer, has also the potential of extending her own partial tree in her context for processing B's utterance, she doesn't need to initiate a new tree unless a miscommunication has occurred.

With the assumed parity of representations between speaker and hearer, providing immediate feedback to the previous speaker has the effect to narrow the focus on a specific point of query leaving the rest of the context unchanged for both interlocutors and thus providing the basis for the incorporation of the fragment. Even in the case of fragmental corrections or disagreeements, i.e. when context mismatch occurs, the interlocutors are modelled as exploiting (parts of) the stored

[3] These *linked* structures are suppressed in all diagrams.

contextual components to achieve interpretation of the fragment. The advantage of this emerges in the unified characterisation of any type of *ellipsis* construal as strictly context-dependence. Since context in DS involves the storing of current partial tree, word sequence to date, plus the actions used to date to build the partial tree, ellipsis construal can target any of those stored elements. In particular, for split/joint utterances and any type of feedback this enables switch from hearer to speaker at any arbitrary point in the dialogue, without such fragmental utterances having to be interpreted as propositional in type (as is standard elsewhere, e.g. Purver (2004)).[4] This then captures the general dynamics involved in taking what the other speaker has just uttered, with the potential at any point to update it to accord with one's own emerging understanding of the interaction. In this way, speakers are able to guide each other's interpretations, and thus *jointly* narrow down as early as possible the burgeoning interpretive space.

4 NSU fragments in Dynamic Syntax

4.1 Non-repetitive Acknowledgement

From a DS perspective, phenomena like *reformulations* as in (1), or *extensions* to what one understands of the other speaker's utterance, (2), can be handled with exactly the same mechanisms as the sentence-internal phenomenon independently identifiable as *apposition* and illustrated below:

(5) A friend of my mother's, someone very famous, is coming to stay.
(6) Bob, the friend of Ruth's, is coming to stay.

According to Cann et al. (2005), appositions are analysed as involving the building of paired terms across a tree transition, building *linked* structures defined to share a term. Reflecting this constraint, the update rule for such structures then takes the pair of type e terms so formed and yields a term whose compound restrictor is made up of the predicative content from each.

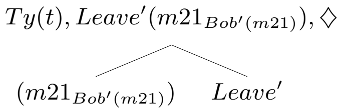
We now have the basis for analysing extensions and non-repetitive acknowledgements which build on what has been previously said by way of confirming the previous utterance. Recall examples (1) and (2). There are two ways in which such fragments which reformulate an interlocutor A's utterance are produced: either (a) as interruptions of A's utterance in which case immediate confirmation of identification of the individual concerned is provided, see (2), or (b) as confirmations/extensions of A's utterance after the whole of her utterance has been integrated, see (1). Both are modelled by DS as incremental additions.

Turning to (1), B's response *(Yeah,) the accounts guy*[5] constitutes both a reformulation of A's utterance, as well as an extension of A's referring expression, in effect providing the appositive expression 'Bob, the accounts guy'. This means that B has processed A's original utterance, according to some identification of the individual associated with the name *Bob*: that is to say, they have constructed a full content representation for this utterance. B's reformulation has the effect of acknowledgement because it signals to A that he has processed/understood her asserted content, and, moreover, has no objection to the content, *unless* mistaken in that identification.

In DS terms, B's context consists of the following tree after processing A's utterance:

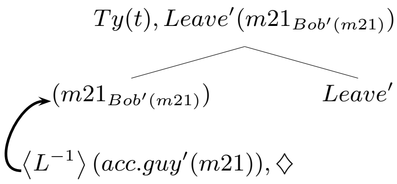
[4] Given the DS concept of linked trees projecting propositional content, we anticipate that this mechanism will be extendable to fragment construal involving inference (see e.g. Schlangen (2003), Schlangen and Lascarides (2003))
[5] Words like *yeah* and *no* are analysed as discourse markers which do not contribute truth conditional content, hence are not represented on the trees

(7) B's Context for 'Yeah'



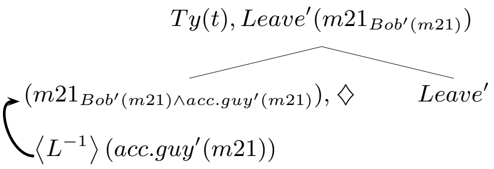
It is now open to B to re-use this representation, stored in his context, as the point of departure for generating the expression *the accounts guy*. In this case his own goal tree will now be decorated with a composite term made up both from the term recovered from parsing A's utterance and the new addition. Simplistically, all this requires is attaching a *linked* tree to the correct node, and then processing the content of the apposition in order to produce the words required. The defined steps include shifting the pointer to the appropriate node, projection of a *linked* tree from that node and processing the words *the accounts guy* (the *linked* tree is condensed below):

(8) B's "parse" tree licensing production of *the accounts guy*: LINK adjunction



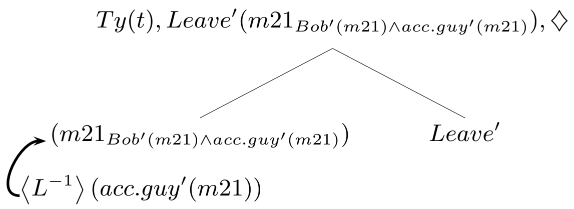
Updating this representation according to the DS processing protocol involves adding the acquired restrictions at the node from which the *linked* tree is projected (individual stages here suppressed):

(9) Updating B's "parse" tree licensing production of *the accounts guy*



Finally, the information is passed up to the top node of the main tree, completing the parse tree to match B's goal tree in uttering the expression *the accounts guy* :

(10) Completing B's "parse" tree licensing production of *the accounts guy*



4.2 Non-repetitive Clarification

In the acknowledgement case above, the term relative to which the *linked* structure is built is fixed; but the very same mechanism can be used when the interlocutor needs clarification. In (2), B again takes as his goal tree a tree decorated with an expansion of the term constructed from parsing A's utterance but nevertheless picking out the same individual. Using the very same mechanism as in (1) of building a *linked* structure constrained to induce shared terms, B provides a distinct expression, the name *Chorlton*, this time before he has completed the parse tree for A's utterance. This name, contributing a metavariable plus the constraint that the individual picked out must be named *Chorlton*, is used to decorate the linked node so that it makes explicit the additional predicative constraint on the individual being described. The outcome of this process, when the linked structure is evaluated, is a composite term $m21_{Doctor'(m21) \wedge Chorlton'(m21)}$. This process, therefore, is identical to that employed in B's utterance in (1), though to a rather different effect at this intermediate stage in the interpretation process, namely a clarification. This extension of the term is confirmed by A, this time trivially replicating the composite term which processing B's utterance has led to (see Kempson et al 2007 for such trivial goal tree-parse tree matches). The eventual effect of the process of inducing *linked* structures to be decorated by coreferential type e terms may thus vary across monologue and different dialogue applications but the mechanism is the same.

4.3 Correction

It might be argued nonetheless that correction is intrinsically a dialogue phenomenon. Consider (4) for example, reproduced below:

(4) A: Bob left.
B: Rob?
A: (No,) (Bob,) the accounts guy.

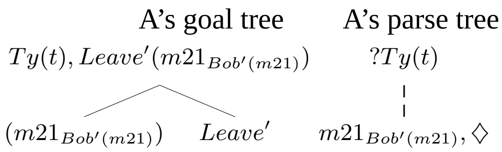
As one alternative, we assume here that B has misheard and requests confirmation of what he has perceived A as saying. A in turn rejects B's utterance and provides more information. Presuming rejection as simple disagreement (i.e. the utterance has been understood, but judged as incorrect), in DS terms, this means that A has in mind a goal tree that licensed what she had produced, which is distinct from the parse tree derived by processing B's clarification. As shown in Kempson et al. (2007), this means that A has been unable to process B's clarification request as an extension of her own context. Instead, she can parse the clarification by exploiting the potential for introducing an initially structurally underspecified tree-node to accommodate the contribution of the word *Rob*. Subsequently, by utilising the actions stored in context previously by processing her own utterance of the word *left*, she is able to complete the integration of the fragment in a new propositional structure.

In order to produce the following correction, what is required is for A to establish as the current most recent representation in context her original goal tree. This can be monotonically achieved by recovering and copying this original goal tree to serve as the current most immediate context[6]. Under these circumstances, given the DS grammar-as-parser perspective, several strategies are now available. A is licensed to repeat the name *Bob* by locally extending the node in the

[6] Corrected representations must be maintained in the context as they can provide antecedents for subsequent anaphoric expressions.

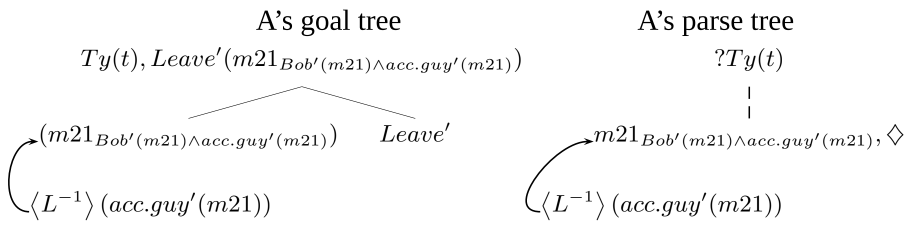
context tree where the representation of the individual referred to is located by using the rule of LATE*ADJUNCTION, a process which involves building a node of type e from a dominating node of that type (illustrated in Kempson et al. 2007). An alternative way of licensing repetition of the word *Bob* is to employ one of the strategies generally available for the parsing of long distance dependencies i.e. constructing initial tree nodes as unfixed (*ADJUNCTION). We will now illustrate briefly the parsing steps showing how the latter strategy can be exploited to license the production of the fragment. Firstly an unfixed node is constructed and this provides the environment appropriate for the (test-)parse of the word *Bob*. As this development leads to a partial tree that subsumes the goal tree, production of *Bob* is licensed:

(11) Licensing production of a correction by *ADJUNCTION:



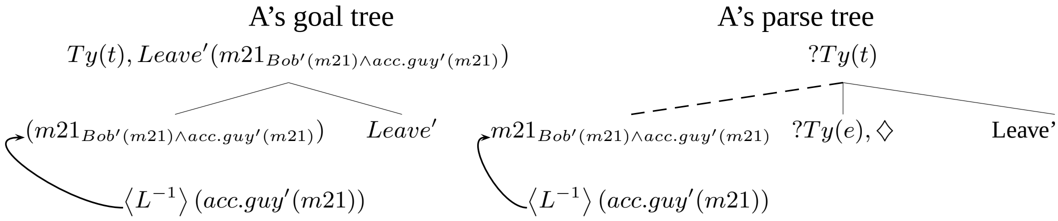
An option available to A at this point is to introduce, in addition or exclusively, a reformulation of her original utterance in order to facilitate identification of the named individual which proved problematic for B previously. She can answer B's utterance of *Rob* with *(No,) (Bob,) the accounts guy*, as in (4) or simply with *(No,) the accounts guy*. Both are licensed by the DS parsing mechanism without more ado. The structure derived by processing such an extension is exactly that of (1) above (compare the goal tree in (15) below and the tree in (10)). So, as previously, a linked tree can be constructed to (test-)parse the expression *the accounts guy* and as subsumption is satisfied at this stage this parse can be pursued in order to achieve a complete match of goal and parse trees:

(12) LINK ADJUNCTION and checking goal tree subsumption:



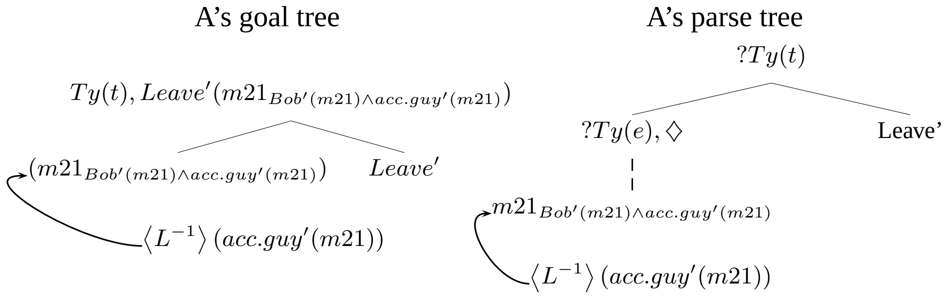
As we mentioned before, *context*, as defined in DS, keeps track not only of tree representations and words but also of the actions contributed by the words and utilised in building up the tree representations. Production of the correction in (4) is licensed to be fragmental because the original actions for parsing/producing the word *left* are available in the context and can be recalled to complete the structure initiated by processing/producing the name *Bob*. So at this stage, the actions for *left* stored in the context can be retrieved and applied to the newly constructed tree; this provides the required predicate without the need to pronounce the word as subsumption is satisfied:

(13) Retrieving and running the actions for *left*, pointer return to subject node and checking goal tree subsumption:

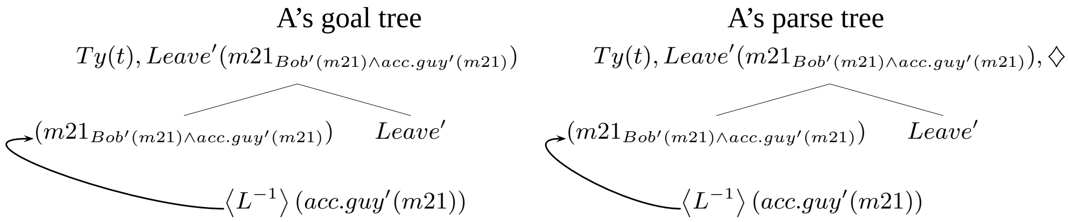


Now the unfixed node that was constructed by (test-)parsing the fragment can unify with the subject node as the only licensed subsequent move. Further standard computational actions will complete the parse tree:

(14) Preparation for UNIFICATION and checking goal tree subsumption:



(15) UNIFICATION and completion of parse tree to match the goal tree:



The result is a parse tree that completely matches the goal tree, hence the fragment *(Bob,) the accounts guy* can be produced as it can be licensed in this particular context.

4.4 Combining Dialogue Functions in a Single Structure

In the examples considered so far, we have seen how a single type of mechanism can serve distinct functions. A more striking case is (3), where the hearer, B, is able to leap to a hypothesis as to how A's question is going to be completed, and provides that completion by way of answer. Here we have the case again where more than one function can be fulfilled even by a single utterance. As in (1)-(2), license for such a use turns on taking the context that was constructed by parsing input from the interlocutor as the point of departure. That B is extending the structure set up by A's utterance is self-evident; but in addition, both A's utterance, if she had completed it, and B's utterance, as presented, are elliptical as to the second disjunct. The success of this particular form of split utterance turns on the fact that what A is presenting is a duplex *yes*-*no* question with both possible answers provided by the two disjuncts. So in completing it by providing just the second disjunct, B can succeed in answering the question while simultaneously completing it. Though there is more to say here, the significance of (3) lies in the use of the single expression *right-handed* to fulfil two functions, both the completion of a question and the provision of an answer. In DS this can be modelled, reflecting the phenomenon itself, without having to assume the superimposition of two distinct structures, one upon the other. Incidentally, this is a case contradicting what is supposedly unique to such interrupting completions, namely,that they require acknowledgement by the hearer before proceeding.

5 Conclusion

As these fragments and their construal have demonstrated, despite serving distinct functions in conversation, the mechanisms which make such diversity possible are general strategies for tree growth available in any type of genre, dialogue or monologue alike. In all cases, the advantage which use of fragments provides is a “least effort” means of re-employing previous content/structure/actions which constitute the *context*. As modelled in DS, it is more economical to reuse information from context rather than constructing representations afresh (via costly processes of lexical retrieval, choice of alternative parsing strategies, etc.).

A further quandary in dialogue construal is that, no matter what avenues for economising their efforts interlocutors may make use of, they are nevertheless faced with an increasing set of interpretative options at any point during the construction of representations. One option available to hearers is to delay a disambiguating move until further input potentially resolves the uncertainty. However, as further input is processed and parsing/interpretive options increase potentially rapidly, maintenance of these open options becomes difficult for a human processor. The incremental definition of the DS formalism allows for the modelling of an alternative available to hearers: at any point they could opt to intervene immediately, and make a direct appeal to the speaker for more information at the maximally relevant point during construction. It seems clear that the latter would be the favoured option and this is what clause-medial fragment interruptions as in (2) illustrate.

The phenomena examined here are also cases where a speaker’s and a hearer’s representations, despite attempts at coordination may, nevertheless, separate sufficiently for them to have to seek to explicitly “repair” the communication (see especially (4)). In the model presented here, the dynamics of interaction allow fully incremental generation and integration of fragmental utterances so that interlocutors can be taken to constantly provide optimal evidence of each other’s representations with necessary adjuncts being able to be incrementally introduced. Unlike other accounts, in this model, fragment construal is modelled sub-sententially with no lifting devices to yield a propositional unit as part of some putative discourse grammar. Indeed, no structures/strategies are posited specific to individual discourse functions to which a fragment is put. From a more general point of view, the analyses presented here provide further evidence (see also Cann et al. (2007)) that a unitary basis for characterising elliptical phenomena as indeed context-dependent interpretation fixing becomes possible if a grammar formalism is adopted in which ”syntax” is defined as the progressive building up of representations of content to reflect real-time processing.

Acknowledgements

This work was supported by grants ESRC RES-062-23-0962 and Leverhulme F07 04OU. We are grateful to three anonymous reviewers for their comments.

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