

Dynamics of Focus in Dialogue

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Abstract

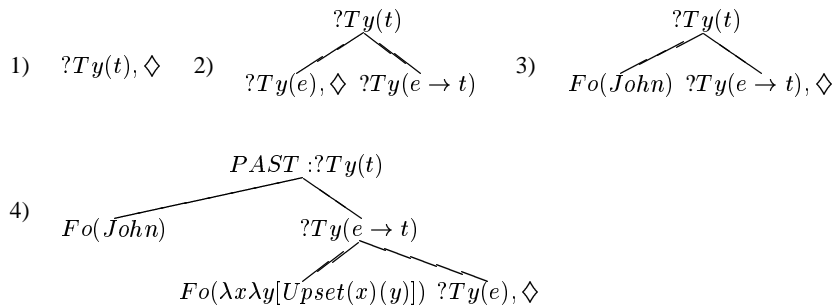
This paper aims to explain how focus effects contribute to building up interpretation in dialogue. As a model of the left-to-right process of understanding as a tree growth process, Dynamic Syntax (Kempson et al 2001) is well-suited: my extending it to focus in dialogue is new. First of all, I shall model focus as a revision device, essentially involving dialogue. Revision has functions of updating, correcting or emphasising certain information to the ongoing dialogue and in the process of doing so, revision involves re-using certain structures given in the context. With the same goal of a revision, focus makes certain words salient or contrastive with respect to the currently parsing context. The significance of these effects is that they are central to the study of dialogue and the concept of context, but they have not formally studied together. Indeed the formal study of dialogue is a new research area in formal syntax, semantics and pragmatics. My research will involve study of the interaction of a range of devices, in particular including contrastive topic. In this paper, I set out three forms of focus (syntactic, phonological and lexical focus) and show their interaction. In doing so, my research will make a contribution to understanding the dynamics between syntax, semantics, phonology and dialogue.

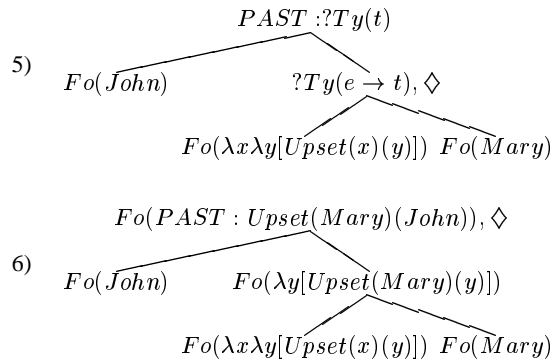
1 Introduction

In this paper I presume the framework of Dynamic Syntax (Kempson et al 2001). Here is a brief introduction. The formalism models the process of building up interpretation as a process of building up partial trees, where the outcome is a tree representing a logical form: the nodes of the tree represent the sub-terms of the logical form. I show this by display, processing (1):

(1) John upset Mary.

The sequence of trees starts from an initial goal, that of completing a logical form of type t , specified as the *requirement* $?Ty(t)$, and setting out subgoals which then have to be met in getting to the overall goal:





Note $Ty(e)$ the semantic type of DP
 $Ty(e \rightarrow t)$ the semantic type of VP.

As this figure shows, the nodes are decorated with formula and type values, and requirements that are imposed on the nodes as they are introduced all have to be met: all assigned requirements have to be fulfilled for a string to be said to be assigned a complete logical form, and be wellformed. Until a string is associated with a tree whose top node has a logical form of type t , the tree is in some way incomplete.

Another form of underspecification is provided by the representation of anaphora, since pronouns are taken to underspecify their interpretation in context. They are defined to project a metavariable as formula value, $Fo(U)$ for which a pragmatic process of substitution provides the value. There are other forms of underspecification and enrichment, but these serve to illustrate my main point. Trees are taken to grow from an initial statement of a goal, a tree with just one node decorated with a requirement $?Ty(t)$ all the way to a fully completed tree – by filling out requirements, adding nodes, and adding formula and type values to nodes, as driven by those requirements.

In modelling ellipsis, the Dynamic Syntax proposal is, then, to use a process of abstraction BACKWARDS along whatever processes of growth are licensed (see Kempson et al 2001, Otsuka in preparation). So for example, in the parsing of the elliptical fragment in (2), which can be interpreted either as “Harry saw Bill” or as “John saw Harry”, we assume that the tree established in interpreting the first sentence is re-used in interpreting the second by taking out information from the first tree so that the second can be parsed against the context provided by this created partial tree:

(2) John saw Bill. Harry too.

For this fragment, a subtree needs to be constructed from the tree established from the first sentence as the basis for interpreting the fragment *Harry*. This subtree is (2') or (2'')

1.1.1 Multiple focus specifications

Though in the literature, there is said to be only one focus per sentence, the data do not confirm this. Consider the following pairs of examples. Henceforth, block capitals mean phonological focus.

- (4) A: What did you eat at breakfast?
- (5) B: Cereal, CRUNCHY NUT.
- (6) B: CEREAL, crunchy nut.

The role of focus in this example is to emphasise or update given information. When A asks a question to B, he/she would not think about Crunchy nut, as he/she does not even know whether B had cereal, bread or porridge. But, nothing can stop B emphasising *crunchy nut*, not *cereal*. This is problematic in alternative semantics, as focus meanings are defined as a set of alternatives to focus (Buring 1997, Rooth 1996) and question meanings are represented as a set of possible answers. In (5) the focus meanings would be a set of crunchy nut, rice crispy and corn flakes, etc, whereas in (6) the focus meaning would be a set of cereal, bread and porridge. This would be the question meaning for (4) as well. Nevertheless, (5) is perfectly fine in dialogue.

1.1.2 Shifting of focus

The second puzzle is that focus can shift between one speaker and another:

- (7) A: Who hit John?
- (8) B: JOHN hit BILL.

Here focus plays a role to correct given information as well as structure. B replies in such a way that reverses A's expectation. This dialogue is also very natural, nevertheless, it is hard to properly capture this kind of focus in model-theoretic framework (in particular Buring). Regarding this puzzle, one challenge will be to deal with these unexpected focus assignments with special reference to its way of re-using given structure or context. In section 2, I will discuss how to represent this focus effect based on Dynamic Syntax and how focus reacts with a given context.

1.1.3 Interaction between different forms of focus

The third puzzle is related to the interaction between syntactic, phonological and lexical focus. We not only have more than one focus, but we can have more than one type of focus, and in combination. Particularly, in Korean there is not only focus by stress, focus by clefting (9), there is a third possibility of lexical focus as in (10):

- (9) *Mina ka po n kess un Jina ita.*
Mina_{SUBJ} see_{REL} thing TOP Jina DEC'
What(The one who) Mina saw was Jina.' [syntactic Focus]

- (10) *Mina ka paro Jina rul poa ss ta.* [lexical focus]
 Mina SUBJ FOCUS Jina OBJ see PAST DEC.
 'It was Jina that Mina saw'

This too can occur in combination with other forms of focus, eg stress:

- (11) *Mina ka po n kess un JINA ita.*
 Mina_{SUBJ} see_{REL} thing TOP Jina DEC'
 What(The one who) Mina saw was Jina.' [syntactic focus+phonological focus]
- (12) *Mina ka paro JINA rul poa ss ta.*
 Mina SUBJ FOCUS Jina OBJ see PAST DEC.
 'Mina saw Jina.' [lexical focus+phonological focus]

The puzzle comes out as (10-12) have the same logical meaning as (13), although they are different syntactically as well as semantically:

- (13) *Mina ka Jina rul poa ss ta.*
 Mina SUBJ Jina OBJ see PAST DEC
 'Mina saw Jina.'

I suggest that the reason why we have not so far been able to reflect this intuition in both syntax and semantics is because the PROCESS of parsing has not been considered, but only the resulting structures. In contrast to this static approach, Dynamic Syntax is suitable to our analysis as it shows incremental growth of information at each step.

1.2 Focus and contrastive topic

The last puzzle is about focus in interaction with contrastive topic:

- (14) *A: Mina ka nwukwu rul po ass ni?*
 Mina SUBJ Who OBJ see PAST INTERG?
 'Who did Mina see? [Korean]
- (15) *Mina nun paro JINA rul po ass ta.*
 Mina TOP FOCUS Jina OBJ see PAST DEC
 'As for Mina, she saw JINA.' [contrastive topic+lexical focus+phonological focus]
- (16) *Mina ka paro JINA rul po ass ta.*
 Mina SUBJ FOCUS Jina OBJ see PAST DEC
 'Mina saw Jina.' [lexical focus+phonological focus]

Interestingly, (15)-(16) have the same logical form and the same focus structure realised by stress and focus-indicator *paro*. However, (15) has contrastive meaning and triggers immediate questions like (17)-(18), whereas (16) does not:

- (17) A:*Sena nun nwukwu rul po ass ni?*
 Sena TOP WHO OBJ see PAST INTRG
 'Who did Sena see?'
- (18) A:*Sena/Yuna/Kuna to Jina rul po ass ni?*
 Sena/Yuna/Kuna also Jina OBJ see PAST INTRG
 'Did Sena/Yuna/Kuna see Jina as well?'

In Section 4, I show how contrastive topic affects focus interpretations and ongoing dialogue. The challenge is to see how Dynamic Syntax is better able to address these problems.

2 Dynamics of Focus and Context: Using Tree Abstraction

In this section, I model the dynamics of focus effects in terms of a pairing of a logical form and context, both represented as partial structures. I will show how focus re-uses given structures, including question-answer pairs and pseudo-cleft sentences. In this analysis, the concept of context and the steps of substitution/abstraction on that context are taken as purely structural.

Consider the following example.

- (19) A:What did you eat breakfast?
 (20) B1: BAGEL, coffee and yogurt.
 (21) B2: BAGEL, COFFEE and YOGURT.
 (22) B3: Bagel, coffee and yogurt.

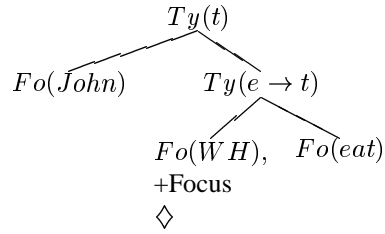
(19) is providing the context for (20)-(22), as B uses the same structure which A uses in answering the question. B is just substituting the term projected from the *wh*-word by terms to be constructed from *bagel, coffee or yogurt*, leaving the structure which was obtained from parsing A's question otherwise unchanged. Following this observation, in this analysis I presume that *wh*-words set up a focus feature which is then assigned to the term that is substituted in their place. Thus, in (20)-(22), three words are all syntactically focussed regardless of stress projection.

So far in Dynamic Syntax, *wh*-words are considered as place-holders like pronouns (See Kempson et al. 2001:150). I think *wh*-words in question are more than place-holders as we've seen through examples in that the placeholder they project must not be identified from context as other metavariables are. They need to be defined as associated with focus.

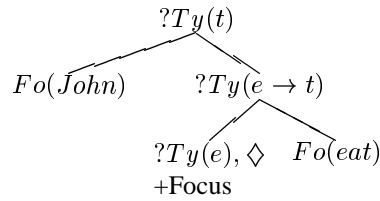
In this paper, I suggest that this focus feature triggers tree abstraction from the context to yield a new structure in which the focus site has been substituted with new terms. By adopting this, we can explain how the three words in (20)-(22) can all be focussed and how this feature can be carried over from A to B. Consider the following pair of trees. Consider.

(23) A:What did John eat at breakfast? B:Bagel,coffee and yogurt.

(23a)Source Tree with Focus feature:



(23b) Abstracted Tree:



This pair of trees can also be applied to (24). Consider the following pseudo-cleft sentence.

(24) What John ate were bagel,coffee and yogurt.

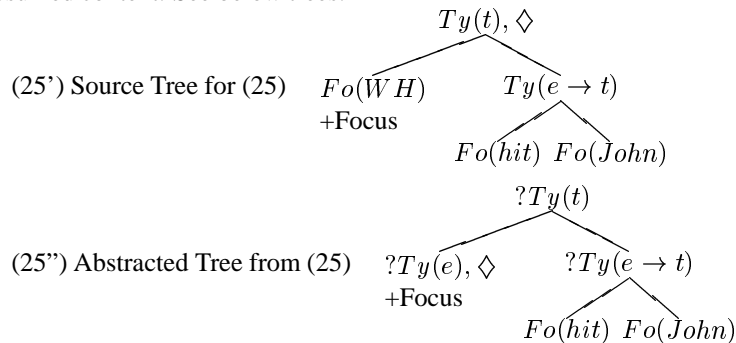
The first part of this sentence plays a role as a context like a question. The only difference from (23) is that in (24), the source tree and abstracted tree co-exist in one single utterance.

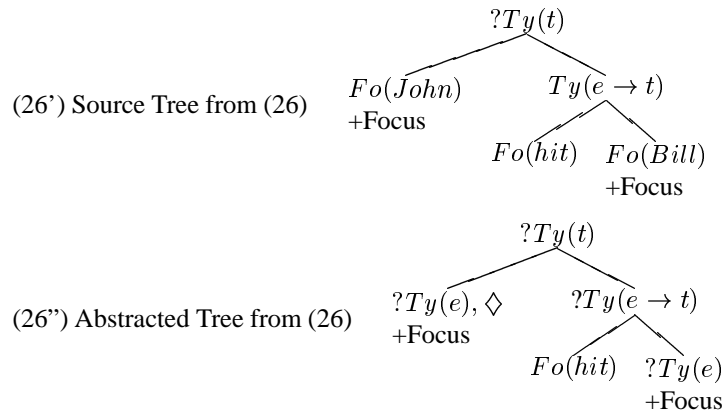
Consider also.

(25) A:Who hit John?

(26) B:JOHN hit BILL.

Here B is not re-using the same structure as that of A's utterance (25), but it shares certain structures with it. Using tree abstraction, we can see how B uses (25) as the presumed context. See below trees.





Compare the abstracted tree for (25) and the abstracted tree for (26). (26'') is the tree presumed by A as the context relative to which B will provide an answer. However, given the stress assignment by B in (26), the indicated context is not (25'') but (26''), a lack of agreement between A and B which will impose on A the necessity of revision of the presumed agreed context. Fo(John) has to be abstracted from (25''), what A took to be the agreed context, to become a new requirement of Type(e) in (26''). This shows that in dialogue, across speakers there is no monotonicity constraint, whereas in monologue basic trees are monotonic and consistent.

3 Dynamics of three forms of focus

In much of the literature, the three forms of focus (syntactic, phonological, lexical focus) are not well distinguished since they are taken to be different realisations of what is structurally the same phenomenon. However, in Dynamic Syntax, there may be several alternative parsing strategies for any one logical form as outcome; so there is no problem about defining different ways in which the construction process for establishing a particular pair of logical form plus context. In this section, I will first define syntactic focus in dialogue. Most of all, I show how three forms of focus interact between themselves and with contrastive topic.

3.1 Syntactic focus

As we have seen in Section 1, phonological focus is realised as stress and lexical focus is realised through certain lexical items, so-called focus-sensitive operators. Then, what is syntactic focus? As far as I know, syntactic focus has not been given a complete characterisation: only some structures like cleft construction, extraposition or inversion are mentioned. (See Taglicht 1984, Krifka 1993). Consider:

- (27) It was John who called.
cleft construction

- (28) A review has just appeared of my latest book.(from Radford, 1988).
extraposition
- (29) More information is what we need.
inversion

Although these structures are distinct, they share the function of highlighting words or phrases in certain positions. However, if we define syntactic focus as only realised by particular kinds of structure, we cannot capture the role of focus in dialogue as discussed in section 2. First of all, we cannot show how focus interacts with context and re-use given structures in dialogue. So in this analysis, I define syntactic focus as a device of revision, which involves emphasising, correcting, updating or clarifying a given context (See Section 1). Syntactic focus is independent of phonological or lexical focus as shown before, hence can combine with it. See the following examples again.

- (30) A:What did you eat breakfast?
- (31) B1:BAGEL,coffee and yogurt.
- (32) B2:BAGEL, COFFEE and YOGURT.
- (33) B3:Bagel,coffee and yogurt.

In (33),none of them is stressed, nevertheless they are syntactically focussed.

3.2 Multiple focus construction

Consider below examples.

- (34) It was John that Bill SAW.(contra Williams 2002)
(syntactic+phonological focus)
- (35) BILL saw JOHN.
(two phonological foci)

As in (34) one sentence can have different types of focus or it can have double focus of the same type as in (35). Basically one sentence can have focus as many as it needs. However, the less is the better from the point of cognition (cf.Schwarzschild 1999). And the three forms of focus are independently assigned as mentioned. In the next section, I will show how these three forms of focus interact with contrastive topic.

4 Dynamics of focus and contrastive topic: Korean

Contrastive Topic is similar to focus in terms of abstracting and substituting given structures. Along with focus, its study is crucial to understanding dialogue. Consider. *nun* in (36)is a contrastive topic marker in Korean.

(36) *B:Mina nun paro JINA rul po ass ta.*
 Mina CT FOCUS Jina OBJ see PAST DEC
 'As for Mina,she saw JINA.' [lexical focus+phonological focus+contrastive topic]

(37) *B:Mina ka paro JINA rul po ass ta.*
 Mina SUBJ FOCUS Jina OBJ see PAST DEC
 'Mina saw Jina.' [lexical focus+phonological focus]

Interestingly, (36)-(37) have the same logical form and the same focus structure realised by stress and focus-indicator *paro*. However, (36) has contrastive meaning and triggers immediate questions such as like (38)-(39), whereas (37) does not. See below.

(38) *A:Sena/Yuna/Kuna nun nwukwu rul po ass ni?*
 Sena/Yuna/Kuna TOP WHO OBJ see PAST INTRG
 'Who did Sena/Yuna/Kuna see?' [sloppy reading]

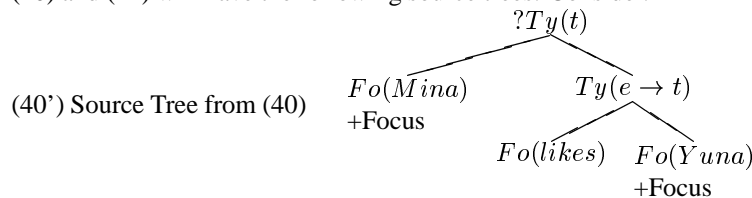
(39) *A:Sena/Yuna/Kuna to Jina rul po ass ni?*
 Sena/Yuna/Kuna also Jina OBJ see PAST INTRG
 'Did Sena/Yuna/Kuna see Jina as well?' [strict reading]

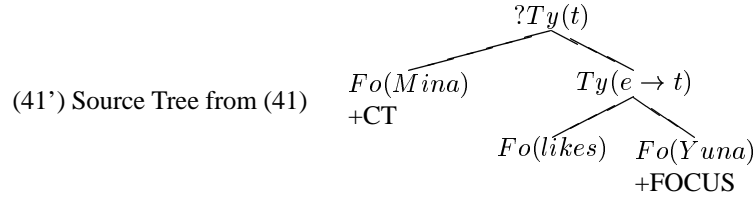
Why is this so? Based on former analysis on focus, here I claim that this is from syntactic/semantic difference between contrastive topic and focus. First, contrastive topic triggers a series of extra questions or in our terms multiple abstracted trees to develop, whereas focus only has a possibility of having one single abstracted tree at each step of dialogue as we have earlier seen in Section 2. Interestingly, contrastive-topic feature(henceforth CT) will not be carried over as dialogue goes on, whereas the focus feature remains in the structure. Consider.

(40) *B:MINA ka YUNA rul coahay.*
 Mina SUBJ Yuna OBJ like
 'Mina likes Yuna.' [two phonological foci]

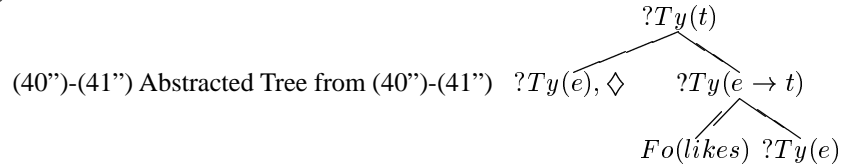
(41) *B:Mina nun YUNA rul coahay.*
 Mina CT Yuna OBJ like
 'Mina likes Yuna.' [contrastive topic + phonological focus]

(40) and (41) will have the following source trees. Consider.





And both (40)-(41) have the following abstracted tree, with slightly different assignment of focus features:



The decoration of Ty(e) node is different between (40)-(41). (40) will carry focus feature over to the abstracted trees, whereas (41) will not carry CT feature to the abstracted trees. Consider the following simple case.

- (42) *B:MINA ka wasse.* [phonological focus]
 Mina SUBJ came
 'Mina came.'
- (43) *B:Mina nun wasse.* [contrastive topic]
 Mina CT came
 'Mina came.'
- (44) *B:Jina to.*
 Jina too
 'Jina came, too.'

When (44) follows (42), *Jina* is focussed. However, when (44) follows (43), *Jina* does not have any contrastive meaning.

Second, more than two CT features in one sentence is much harder to parse than multiple focus constructions:

- (45) *??Mina nun Yuna nun kkokk un cwu ess e.*
 Mina CT Yuna CT flower CT give PAST DEC
 'Mina gave Yuna a flower.' [three contrastive topics]
- (46) *HANKUK i WORLD CUP eyse SPAIN ul ikie ss ta.*
 Korea SUBJ WORLD CUP at Spain OBJ beat PAST DEC
 'Korea beat Spain in the world cup.' [three phonological foci]

Nevertheless, focus and contrastive topic play the same role of re-using certain structures. And from the parsing point of view, for both contrastive topic and focus, it is better to have less if possible (cf. Schwarzschild 1999).

4.1 Conclusion

In this paper, I set out a general framework within which focus effects can be characterised and developed formal device such as focus abstraction in Dynamic Syntax to capture properties of focus and its interaction with context. Also, I established cross-linguistic results (in particular, Korean and English) to demonstrate its explanatory potential. Central to this study is to show how focus re-uses given context and to explain the concept of context which has to be essentially structural. The ultimate goal of this research is to model the dynamics of context interpretation.

4.2 Selected References

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