NON-CORE PARTICIPANT PPs
ARE ADJUNCTS

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Abstract

This paper revisits the question of whether optional, non-core participant PPs are to be treated as arguments or as adjuncts in linguistic theory in general and in LFG grammars in particular. I argue that a number of considerations converge on pointing towards the latter option.

1.   Introduction

The need to be able to track arguments across verbal alternations has been an important motivation behind the use of thematic roles in linguistic theory. By classifying the noun phrase *the window* as the patient argument of the verb in both (1a) and (1b), a convenient tool is made available for the linguist to relate the object of the transitive construction to the subject of the intransitive construction.

(1)   a. *The heat of the fire broke <u>the window</u>.*   **patient**
       b. *<u>The window</u> broke.*   **patient**

At a pure descriptive level, (1) illustrates the fact that the expression of certain distinguished event participant types is not restricted to a specific syntactic function or position in a particular construction type.

While the exact nature of the relation between (1a) and (1b) is an issue in linguistic theory, the fact that *there is* a relation is unquestionable. Consider now the representative set of examples in (2) and (3) from the perspective (1) provides.

(2)   a. *John shook hands <u>with Kate</u>.*   **comitative**
       b. *John cut the meat <u>with my knife</u>.*   **instrument**
       c. *John doesn't appeal <u>to Kate</u>.*   **experiencer**
       d. *John baked <u>Kate</u> a loaf of bread.*   **benefactive**
       e. *<u>The heat of the fire</u> broke the window.* **cause**

(3)   a. *John cleaned the room <u>with Kate</u>.*   **comitative**
       b. *John broke the window <u>with a hammer</u>.*   **instrument**
       c. *John seemed <u>to Kate</u> to be happy.*   **experiencer**
       d. *John baked a loaf of bread <u>for Kate</u>.*   **benefactive**
       e. *The window broke <u>from the heat of the fire</u>.* **cause**

There is a good consensus in the pertinent literature that the underlined expressions in (2) are syntactic arguments of their verbs, with the type of participation that the descriptive labels on the right spell out. The underlined

expressions in (3), which I will be referring to as *non-core participant PPs*, refer to event-internal participants whose type of participation is roughly describable by the same labels as in the corresponding cases in (2). An important question for linguistic theory is whether the two sets of expressions are to be related to each other, and if yes, then what exactly is the level where the correspondence is to be drawn. Most importantly, do non-core participant PPs populate a(rgument-)structure, and if they do, are they indistinguishable at this level from the underlined expressions in (2)?

This issue has received some fresh attention within the LFG literature in recent years. In their programmatic paper, Needham and Toivonen (2011) argue that non-core participant PPs form a subset of expressions that they analyse as derived arguments. Zaenen and Crouch (2009), on the other hand, argue that all semantically marked obliques should be treated as adjuncts. In earlier work on dative experiencers (Rákosi 2006a,b), I proposed an account in which non-core participant PPs are thematic adjuncts.

The goal of this paper is to revisit this question and provide further arguments for the adjunct analysis of non-core participant PPs. Assuming that the non-core participant PPs in (3) belong to the same broad semantic types as the respective arguments in (2), I embrace a view of grammar that by default allows for varying syntactic instantiations of participant types in the absence of constraints to the contrary. For example, comitatives can be on the argument list of verbs of social interaction and thus realized as complements, but they can also be licensed in a much larger set of contexts as adjuncts. This assumption can be viewed as a stronger version of the *dual analysis* of Dowty (2003), who argues that every complement can be analysed as an adjunct in the default case, and vice versa.

The paper does not discuss VP-internal directional, locative, source, manner, temporal or purpose PPs. I restrict my attention to the types listed above in (3), and I use the term non-core participant PPs to cover this subset of what have been called elsewhere circumstantial phrases (see, for example, Cinque 2006). Furthermore, I focus on English and Hungarian data, and I do not discuss applicative-marking languages, where the grammar of non-core participant PPs is markedly different.

The structure of the paper is as follows. After this introduction, I give an overview of previous LFG proposals in Section 2. In Section 3, I list a number of primary arguments in favour of the adjunct analysis. In Section 4, I take a bird's eye view of conventional syntactic tests of argumenthood, only to conclude with other authors that these tests do not identify non-core participant PPs unambiguously either as arguments or as adjuncts. In Section 5, I add further conceptual arguments for the adjunct analysis, occasioned by two case studies that I briefly discuss. I conclude in Section 6.

2. An overview of the LFG literature

To my knowledge, the earliest discussion of the proper LFG treatment of non-core participant PPs appears in Bresnan (1982). Since the following passage gives a concise statement of the argument analysis, I quote it in full:

> "It is possible to define a lexical rule of *Instrumentalization* (analogous to lexical rules of *Causativization*) which converts an *n*-adic predicate argument structure *P* to an *n*+1-adic predicate argument structure *P-with* whose *n*+1st argument is assigned the grammatical function INSTR OBJ [instrumental object]. For motivation, note that Instrumentalization alters the inherent semantic properties of a predicate as illustrated in (54-55). …

> (54)   a.   John killed Harry.
>   b.   John killed Harry with dynamite.
> (55)   a.   An explosion killed Harry.
>   b.   #An explosion killed Harry with dynamite."

<div align="right">(Bresnan 1982: 165)</div>

This analysis is in the spirit of early approaches to argument structure in the 1960s, where non-core participant PPs were generally treated as arguments. In essence, Bresnan argues here that the lexical process in question creates an agentive predicate (55) from a basic lexical entry with an agent or cause subject argument (54). An obvious alternative is to assume a single lexical entry with a subject argument underspecified for agentivity, and to let the agent reading license the instrument. I discuss this alternative in some detail in Section 3. What is directly relevant is that as far as the treatment of non-core participant PPs is concerned, Bresnan (1982) can be regarded as the argument analysis par excellence in LFG.

Needham and Toivonen (2011) give renewed impetus to this analysis. They, nevertheless, do not treat what I call here non-core participant PPs as fully-fledged arguments, but as *derived arguments*. The following extracts from their paper are illustrative:

> "Bresnan (2001, 310) notes: 'The lexical stock of a-structures in a language can be extended by morphological means.' This implies that there is a basic lexical stock that is a subset of the entire lexical stock. The analysis that we propose assumes that arguments listed in the basic a-structure of verbs have a different status than arguments listed in the manipulated a-structure. …
> Our treatment of instrumentalization differs slightly from Bresnan's … but the basic idea is the same. … Under this analysis, *with-*

> instruments are arguments. However, they are not listed as part of
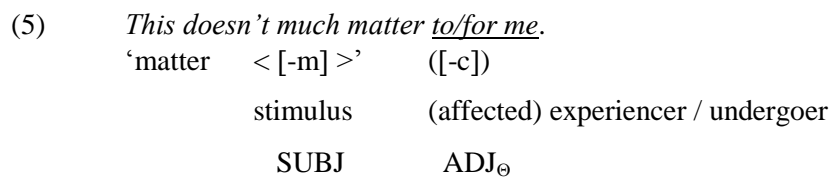> the basic argument structure of verbs, but optionally added … ."

That is, they assume that the lexicon contains core and derived entries that are distinguishable from each other, and, concomitantly, so are core and derived arguments. However, they do not formalize this difference beyond the proposal that lexical rules introduce derived arguments into what essentially is a regular argument structure.

Webb (2008) takes the underlying intuition a step further in his analysis of instruments. While discussing non-core instrument PPs as *adjuncts*, he does introduce them on what he calls the second tier of *argument structure*. Consider (4) for illustration:

(4) *Jack opened the door with the key*.

    1st tier   < p-a   p-p >

    2nd tier   < p-a >
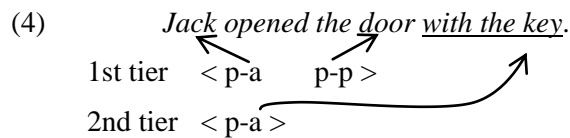
The thematic content of the two tiers is described in terms of Dowtian (1991) proto-roles, with the respective mappings being informally indicated here with the arrows. The instrument is treated as a sort of a secondary (proto-) agent, mapped onto the thematic oblique phrase. Hurst (2010) presents a very similar analysis of comitatives. Comitatives are briefly discussed here in Section 5.

My earlier proposal (Rákosi 2006a) is based on a rather similar core of background assumptions. A significant difference is that I explicitly treat non-core participant PPs as adjuncts that receive thematic specification in terms of Reinhart's (2002) Theta System. In Rákosi (2006b), I describe a possible LFG-theoretic implementation of this analysis. Consider the case of optional dative experiencers, which I claim to be thematic adjuncts:

(5) *This doesn't much matter to/for me*.
     'matter   < [-m] >'   ([-c])

            stimulus   (affected) experiencer / undergoer

              SUBJ   ADJ$_\Theta$

A thematic adjunct is treated as a regular adjunct, but it is indexed by a thematic role label ([-m] stands for a mentally non-involved participant in Reinhart's system, and [-c] is a participant that is not related causally to the event). Such an adjunct is not introduced on the argument list, and the round bracket notation used in (5) is essentially only a reminder that a thematic

adjunct of the given type can be licensed in the context of the argument structure to its left.

Finally, in what we can call the *pure adjunct analysis*, non-core participant PPs are treated as essentially regular VP-internal modifiers without any thematic specification. Asudeh and Toivonen (2007, 2012) argue, for example, that verbs can assign (non-thematic) semantic roles to adjuncts that are not on their argument list. In their analysis, the experiencer PP in (5) is a PGOAL ('goal of perception'). Driven mostly by the exigencies of computational implementation, Zaenen and Crouch (2009) make a proposal to treat *all* semantically marked PPs as adjuncts. I discuss their implementational concerns in Section 5. At this point it should suffice to note that there are proponents of the pure adjunct analysis within the LFG framework.

Thus the overall picture is a relatively varied scene stretching from the strong argument analysis to the strong adjunct analysis. This analytical spectrum seems to reflect an underlying variation in how strongly non-core participant PPs are assumed to be associated with the licensing verb. The strong argument analysis postulates a strong association, whereas the strong adjunct analysis stems from an increased emphasis on the independence of such PPs. If the above sample of analyses is representative, then LFG seems to have been moving towards the assumption a weaker association. I note here without further comment that this move parallels recent developments elsewhere in generative grammar, cf. especially the *generalized theory of applicatives* (Pylkkänen 2002, Cuervo 2003) and the *cartographic approach to circumstantials* (Schweikert 2004, Cinque 2006).

3. Primary arguments for the adjunct analysis

I repeat examples (3) as (6) to illustrate the forthcoming discussion.

(6) a. *John cleaned the room (with Kate).*   **comitative**
  b. *John broke the window (with a hammer).*   **instrument**
  c. *John seemed (to Kate) to be happy.*   **experiencer**
  d. *John baked a loaf of bread (for Kate).*   **benefactive**
  e. *The window broke (from the heat of the fire).*   **cause**

The underlined PPs are all classified here as non-core participant PPs. As such, they all show a level of independence from the governing verb that is not characteristic of arguments. My aim in this section is to substantiate this essential fact of the grammar of non-core participant PPs.

It is a defining property of these PPs that they are syntactically optional. Each of the underlined phrases can be dropped in (6), and the remaining

structure stays grammatical. And though certain types of arguments may also be optional, optionality is a characteristic property of adjuncts (see Asudeh and Toivonen 2012 for a discussion).

Whether non-core participant PPs are also optional semantically, i.e., whether they are entailed by the predicate or not, is a more contentious issue. The comitative (6a), the instrument (6b) and the benefactive (6d) are clearly not entailed. Cleaning, breaking or baking events do not need to involve either a participant who accompanies the agent, or an instrument, or someone who benefits from the results. As I briefly argue in Section 5, anticausative verbs are also non-causal in nature and, consequently, they do not entail the presence of a cause (6e). It follows then that the PP in (6e) genuinely introduces a cause, rather than spells out or modifies one that is present in the semantics of the verb. The existence of the participant denoted by the PP experiencer in (6c) does appear to be entailed – see Asudeh and Toivonen (2007, 2012) for an in-depth discussion of this issue. With other experiencer predicates, however, the presence of such an entailment relation is not so obvious, cf.:

(7) a. *This doesn't much matter.*
     b. *This situation is unpleasant.*

Matter or *unpleasant* fairly frequently occur without the experiencer PP. It is often not trivially clear in these cases whether we are dealing with the lack of an entailed experiencer or with the presence of an entailed indefinite implicit argument. I have argued for the former position in Rákosi (2006a), and I refer the reader to Jackendoff (2007) for more on this issue. Here I simply conclude that non-core participant PPs are dominantly non-entailed, and dative experiencers represent a more complex case.

Given that these PPs are not subcategorized by the verb, their morphological form is not fixed, but is subject to variation as is allowed by the semantics of the given participant type. The following sentences illustrate how non-core PPs differ from true arguments in this respect:

(8) a. *This has never appealed to/*for me.*
     b. *This has never occurred to/*for me.*

(9) a. *This doesn't matter to/for me.*
     b. *This doesn't seem the best option to/for me.*

(10) a. *John shook hands with Kate.*
     b. **John shook hands without/together with Kate.*

(11) a. *John cleaned the room with Kate.*
     b. *John cleaned the room without/together with Kate.*

Experiencer and comitative arguments (8 and 10) are coded via designated markers, unlike the corresponding non-core PPs (9 and 11), whose morphosyntactic coding is subject to variation.

The assumption that non-core participant PPs are adjuncts explains why they do not change the semantic or the grammatical properties of the verb they combine with. Consider the following examples:

(12) a. *Peter works for Kate.*
      b. *Peter works with Kate.*

(13) a. *Peter goes for Kate.*
      b. *I like the salary that goes with the job.*

(14) a. *Peter walked for 10 minutes/*in 10 minutes.*
      b. *Peter walked to the bank *for ten minutes/in 10 minutes.*

(15) a. *This mattered only for 10 minutes/*in 10 minutes.*
      b. *This mattered to Peter only for 10 minutes/*in 10 minutes.*

While *goes for* and *goes with* describe different types of events (13), the addition of a benefactive or a comitative PP in (12) does not change the semantics of the verb and the construction refers to the same type of *working* event as one without any non-core PP. (14) illustrates the well-known fact that directional PPs have the force of creating a telic predicate and thus change the inherent aspectual profile of the verb (the stars with the adverbials are relative to the intended, default aspectual interpretations of the predicates). Notice that this fact indicates that directionals are indeed more argument-like than the non-core participant PPs we investigate here. These latter do not change the inherent aspectual specification of the verb, as (15) shows. Thus non-core participant PPs seem to be modifiers, rather than arguments of the verb. This is only to be expected under the adjunct analysis.

Under this view, the data discussed by Bresnan (1982), which we have seen earlier in Section 2, receive a different explanation. If the instrumental in (6) is not an argument, but an adjunct modifier, the question is not what its insertion does to the base verb. Instead, the question is what properties of the base structure license the insertion of the instrument.

(16) a. *John killed Harry with a dynamite.*
      b. *#An explosion killed Harry with a dynamite.*

As many have argued in the literature, instruments are licensed in the presence of an agent argument (see, a.o., Reinhart 2002 and Needham and Toivonen 2011). The subject argument of *kill* can be either an agent or a cause, but since only the former licenses the instrument, (16b) is not well-formed.

So non-core instruments at first appear to be licensed by the argument structure of the verb. But benefactives, for example, are known to be licensed by properties of the event denoted by the verb, rather by its argument structure (see Marelj 2005). The presence of an agent is required, but this agent can be only implied (17b,c) rather than be explicitly present (17a).

(17)   a. *I did it for you.*
       b. *He died for you.*
       c. *I'll be there for you.*

On closer inspection, it turns out that instruments are also subject to somewhat weaker licensing conditions. As (18a) from Schütze (1995: 127) shows, they can be licensed in the presence of an implied agent; and Schäfer (2008: 99) argues that animacy in itself is enough to license an instrument even in the absence of volition (18b):

(18)   a. *The nail came away from the wall with the back of a hammer.*
       b. *John unintentionally broke the vase with the hammer.*

Space limitations prevent me from discussing further examples, but this behaviour is characteristic of each non-core participant PP type discussed in this paper. While their licensing is primarily dependent on the argument structure of the base verb, they do seem to be accommodated at the level of the event denoted. This property they share with agent-oriented adverbials, which are subject to similar, weak licensing conditions, cf.:

(19)   a. *I am here deliberately.*
       b. *I like you on purpose.*

We can conclude that as far as their licensing is concerned, non-core participant PPs pattern with certain types of adjuncts, rather than arguments.

I must also mention two facts that at first appear to render non-core participant PP similar to arguments. First, their semantics is not conditioned by the c-structure position that they occupy (20) – the *for*-PP has the same semantic type in its usual position (20a) as it has sentence-initially as a topic. This is a property they share with arguments (21).

(20)   a. *John didn't bake a loaf of bread for Kate.*
       b. *For Kate, John didn't bake a loaf of bread.*

(21)   a. *John didn't appeal to Kate.*
       b. *To Kate, John didn't appeal.*

Adverbial adjuncts fall into two groups in this respect. Light adverbials often have a position-sensitive interpretation. The pair in (22) is from Morzycki (2005: 8). In (22a), the adverb *happily* describes the manner of playing, but in (22b) it describes the speaker's attitude towards the event. Heavy adverbials, however, have invariable semantics that c-structure variation will not affect (23). The PP is a manner adverbial in both (23a) and (23b).

(22) a. *Clyde would play the tuba happily*.
      b. *Happily, Clyde would play the tuba*.

(23) a. *In a happy manner, Clyde would play the tuba*.
      b. *Clyde would play the tuba in a happy manner*.

Therefore non-core participant PPs, *qua* adjuncts, pattern with heavy adverbials, as is expected.

The second fundamental argument-like property of non-core PPs is that they are generally non-iterable, a point already raised by Bresnan (1982: 165). Schütze (1995: 130-131) points out nevertheless, that sometimes this constraint can be violated - compare (24a) with (24b).

(24) a. **I wrote this paper with my computer with my Macintosh Quadra*.
      b. *I wrote this paper with my computer with Microsoft Word*.

Whether (24b) tells us something deep about the grammar of non-core instruments is an issue that I leave open here (cf. also Zaenen and Crouch (2009: 646) on how our linguistic stand may influence our interpretation of such data). What underlies the lack of iteration is the uniqueness constraint, and a more substantial question is whether this constraint regulates only true arguments. Asudeh and Toivonen (2012) argue on independent grounds that the domain of uniqueness includes not only arguments, but also a subset of non-thematic semantic roles (see also Carlson 1998 for an important discussion of this issue). If that is a legitimate extension, then non-iterativity is not a sufficient condition for argumenthood. What we have seen in this section then is a sort of behaviour which is fully consistent with and is explained by the assumed adjunct status of non-core participant PPs.

4.   A quick look at the syntactic scene

Needham and Toivonen (2011) catalogue a number of syntactic tests that have been discussed in the pertinent literature as argument diagnostics, including preposition stranding, VP anaphora, VP-focussed pseudo-clefting, VP-preposing and *wh*-word conjunction. In the LFG literature, Bresnan (1982) and Dalrymple (2001) provide further overviews of the adjunct/argument distinction and its grammatical correlates. There is

obviously a much wider literature on this fundamental issue, which I cannot give due credit to here. The single point I want to stress here, together with Needham and Toivonen (2001), is that non-core participant PPs show mixed behaviour with respect to traditional syntactic tests of argumenthood.

The data that I present here to illustrate this point concern preposition stranding and VP-preposing. Extraction of the NP-complement of a preposition is possible if the PP is an argument (25a). If the PP is a non-core participant phrase, then such extraction is sometimes possible (25c), sometimes not (25b). (25b) is taken from Needham and Toivonen (2011: 411).

(25) a. *Who did you tell it to that it is going to rain*?
　　 b. **Who does it look to like it's going to rain*?
　　 c. *Who did you cook the dinner with*?

On the basis of this test, non-core comitatives are argument-like, but non-core experiencers are not. Does this warrant the conclusion that the former is an argument but the latter is not?

First of all, preposition stranding is subject to many constraints that may influence the result of the testing. Consider the following data quoted from Hornstein and Weinberg (1981) in Cinque (2006: 150):

(26) a. *Who did John talk to about Harry yesterday*?
　　 b. *??Who did John talk about Harry to yesterday*?

(27) a. *Who did John talk to Harry about*?
　　 b. *??Who did John talk about to Harry*?

The basic order of the two PPs after the verb *talk* is *to*-PP > *about*-PP. If the P-object is extracted from its basic position (26a and 27a), then the result is fully acceptable for both PPs. If we flip the two, which is an otherwise attested and grammatical order, extraction and the concomitant preposition stranding becomes hardly acceptable (26b and 27b). Notice that this constraint has nothing to do with the argument status of the PP per se: it is a constraint that bans preposition stranding if the PP does not occupy its basic/neutral c-structure position. So at best, argumenthood is a precondition for preposition stranding (assuming that the *about*-PP in 26-27 is an argument, which is not obvious).

Still, let us suppose that the *with*-PP in (25c) is an argument on the basis of the success of preposition stranding. Consider then what happens if we try to apply the VP-preposing test (see Needham and Toivonen 2011). Only adjuncts can be left behind if the VP is preposed, but arguments must be included in the preposed VP.

(28)   a. *I wanted to meet with him, and meet I did with him at 10pm.
        b. I wanted to cook with him, and cook I did with him at 10pm.

(28a) includes the agentive ('appointment') *meet* predicate, which takes an oblique *with*-PP. Since the PP is not included in the preposed VP, the result is ungrammatical. The *with*-PP in (28b) is, however, a non-core comitative phrase and it can stay behind. This tells us that the non-core comitative *with*-PP is an adjunct, contrary to our earlier conclusion reached on the basis of (25c).

If this brief example convinces the reader as representative, then we can conclude that non-core PPs show mixed behaviour with respect to traditional syntactic tests of argumenthood. Needham and Toivonen (2011) explain this by pointing out that some of these tests do not test for argumenthood *per se*, but may be conditioned by further functional or configurational factors. Furthermore, they also argue that some tests may distinguish between arguments and what they call *derived arguments*. Recall that non-core participant PPs form a subset of their category of derived arguments.

But there is another way of looking at this situation. Given that the test results are not consistent in this domain, there is no a priori advantage in classifying non-core PPs either as adjuncts or as arguments of any sort. And in fact, our grammar can stay more constrained if we allow for a strict and relatively well-behaving category of arguments, one which does not include non-core PPs. Classifying non-core PPs as adjuncts is no better or worse explanation for their mixed behaviour than classifying them as arguments. Given that we have seen a number of arguments supporting the adjunct analysis in Section 3, I conclude this section by maintaining this analysis in the face of the data discussed here.

5.   Three further arguments for the adjunct analysis

Finally, I want to add three further conceptual arguments supporting the adjunct analysis that I have tried to substantiate in the previous sections. They support the adjunct analysis by offering theoretical and implementational advantages.

Recall that I started this paper with the assumption that languages, by default, allow for variable syntactic realizations of the same semantic supertypes of participants. So in principle, nothing precludes the possibility that a comitative or a cause can be realized as an argument in certain cases and as a (VP-internal) adjunct in certain others. The former happens in the case of designated predicate classes, and the latter happens, as we have seen, if certain properties of the event license the adjunct. I briefly discuss here two case studies as the first argument for the adjunct analysis. The logic of the

argument is the same in the two cases: if we lift what I claim to be an adjunct participant PP to become an argument, then we lose the ability to properly account for why and how these phrases differ from true arguments.

Consider comitative arguments first, discussed in more detail in, among others, Dimitriadis (2008), Hurst (2010), Rákosi (2003, 2008) and Siloni (2008, 2011). Verbs of social interaction consistently take comitative arguments in Hungarian (29a), whereas non-core comitative adjuncts are generally licensed if an agentive participant is present (29b).

(29) a. *János   csókolóz-ott   (Kati-val).*
         John   kiss-PAST.3SG   Kate-with
         'John was involved in a mutual kissing activity (with Kate).'

     b. *János fut-ott   (Kati-val).*
         John run-PAST.3SG   Kate-with
         'John ran with Kate.'

Both types are syntactically optional in Hungarian, but notice that argument comitatives are always entailed, as the English translation tries to show.

I mention here two further facts that differentiate the two types. First, argument comitatives have fixed coding, unlike adjunct comitatives, which can be modified. For expository purposes, I use English examples, but the same facts carry over to Hungarian.

(30) a. *John shook hands* (**together*) *with Kate.*
     b. *John ran* (*together*) *with Kate.*

Second, only comitative arguments license anaphors in Hungarian, comitative adjuncts do not, cf.:

(31) a. *János és   Kati egymás-sal   csókolóz-t-ak.*
         John and   Kate each.other-with   kiss-PAST-3PL
         'John and Kate were involved in a mutual kissing activity with each other.'

     b. **János és   Kati egymás-sal   futot-t-ak.*
         John and   Kate each.other-with   run-PAST-3PL
         'John and Kate ran with each other.'

Further differences between the two types are discussed in Rákosi (2003). These differences are substantial enough to claim that non-core comitatives are adjuncts, and not oblique arguments of the verb.

For a second quick thought experiment, consider the issue of the anticausative alternation:

(33)   a.   *The heat of the fire broke the window.*
         b.   *The window was broken by the heat of the fire.*
         c.   *The window broke* (*from the heat of the fire*).

The transitive *break* is obviously a semantically dyadic predicate, and so is the passive verb. Analyses diverge in whether they treat the passive *by*-phrase as an adjunct parasitic on the underlying but supressed argument position (see Grimshaw 1991), or as an oblique argument (see Kibort 2001). In either case, a cause argument is present in the semantic representation of the verb.

It is this causal component that is missing from the basic anticausative verb in (33c). As discussed by Piñón (2001), Reinhart (2002), Giorgolo and Asudeh (this volume) and Rákosi (2012), among others, there is no straightforward evidence for the presence of a causal component in either English or Hungarian anticausatives (but see Alexiadou et al. 2006, and Koontz-Garboden 2009 for claims to the contrary). The following example is from Giorgolo and Asudeh, and it illustrates that no external causer is entailed in the structure:

(34)   *Yesterday, at three, the door closed. Nothing closed it.*

Thus the *from*-PP in (33c) must be a genuine introducer of a cause. That this is so is indicated by the fact that *from*-PPs can introduce causes even in the context of stative predicates, cf.:

(35)   *She was somewhat tired from the journey.*

Given these considerations, it seems motivated to treat the *from*-PP in (33c) as an adjunct, not as an argument. Notice that if we did not do so, and treated this PP as an argument, then the difference between passive and anticausative structures would be somewhat mysterious. Also, such a move would be highly unnatural, since it would involve the deletion of a cause argument during anticausative formation and the subsequent introduction of another one via the insertion of the *from*-PP. Much more motivated is to assume that these *from*-causes are adjuncts, which is what I aimed to demonstrate.

The next (and the last) two arguments for the adjunct-analysis of non-core participant PPs are closely related, as they respectively target the same underlying issue from the perspective of the theory and that of the computational implementation. For the sake of argument, let us assume that the adjunct analysis is not on the right track, and the two bracketed PPs in (36) are optional or derived arguments.

(36)   *I painted a picture* (*with Mary*) (*for her father*).

(37) a. *paint*$_1$ < agent, patient >
       b. *paint*$_2$ < agent, patient, comitative >
       c. *paint*$_3$ < agent, patient, benefactive >
       d. *paint*$_4$ < agent, patient, comitative, benefactive >

Under the argument analysis of non-core participant PPs, we need at least the 4 lexical entries in (37) for the verb *paint* to be able to describe the data in (36).

Obviously, such a consequence is not alien to the spirit of LFG, given that it is designed to have a large lexicon. Appropriate lexical rules can derive (37b-d) from (37a), as both Bresnan (1982) and Needham and Toivonen (2011) show. The result will potentially be an exponential increase in the number of verbal lexical entries, many of which will come with heavy argument structures of a relatively large size. However, research on argument structure seems to have been going in a different direction. To be able to handle heavy argument structures, and, especially, to be able to distinguish a larger number of oblique argument types, we need a larger set of thematic roles (or features) than what most would like to see (see Carlson 1998 on this). And some theories of argument structure have been designed explicitly not to allow for more than 4 arguments in any given argument structure. Reinhart's (2002) Theta System, for example, is one such framework (see especially Marelj 2005).

The analysis in (37) also raises some issues for the computational implementation of LFG grammars. This is the major concern that Zaenen and Crouch (2009) have against the argument analysis: it creates oblique/adjunct ambiguities in parsing unless we are able to constrain it properly. But that task is not easy. Since core (or non-derived) argument structures like (37a) exists, any non-core PP can be analysed by default as an adjunct or as an oblique argument. If we, however, assume the adjunct analysis of non-core participant PPs, then this kind of parsing ambiguity disappears.

These last two considerations are not decisive in and of themselves. It is possible to maintain the argument analysis that (37) represents both from a theoretical and an implementational perspective. However, taken together with the rest of the argumentation that I have presented in this paper, I believe these considerations give further support to the adjunct analysis rather than weaken it.

6.   Conclusions

In this paper, I have argued for the adjunct analysis of non-core participant PPs on the grounds of the following considerations. First, this analysis captures certain salient grammatical properties of non-core PPs in an

obvious way. Second, acknowledging the mixed syntactic properties of non-core PPs, the adjunct analysis allows for a stricter and more constrained treatment of true arguments. Third, there are comparable constructions with participants belonging to the same broader semantic type where it is clearly motivated empirically to maintain an argument/adjunct distinction to be able to capture the facts. Fourth, the adjunct analysis has implementational advantages (as discussed by Zaenen and Crouch 2009). Five, no heavy argument structures are generated under the adjunct approach, which may be seen as an advantage given certain theoretical and pre-theoretical assumptions.

A question that I have not discussed here is whether non-core participant PPs, qua adjuncts, are to be distinguished formally from regular adjuncts. As I have briefly noted in Section 2, I proposed in earlier work that they may be indexed by thematic features (Rákosi 2006a,b). The resulting system is summarized in Table 1.

	+thematic	-thematic
+argument	ARG_Θ	ARG
-argument	ADJ_Θ	ADJ

Table 1. *Feature decomposition of argument and adjunct expressions*

Semantic arguments are thematic, but the type inventory of LFG also includes non-semantic (non-thematic) syntactic arguments. Expletives or "raised" arguments are treated as syntactic arguments of the matrix predicate that are not listed on the semantic argument list. Adjuncts do not receive a thematic role. If non-core participant PPs receive thematic specification, then the above feature-based inventory becomes complete.

This move raises a number of issues. Most importantly for our purposes, now we need to handle two types of adjuncts, rather than distinguish between two types of arguments, as happens in the system proposed by Needham and Toivonen (2011). Under either approach, we enrich the inventory of our grammar, which may have unwelcome consequences in both cases, some of which have been discussed in this article. This issue, however, is largely orthogonal to the primary claim that I wanted to defend in this paper: the adjunct analysis of non-core participant PPs may offer more advantages for LFG grammars than the argument analysis.

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