

Argument vs. Adjunct

Task Statement:

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The paper by Merlo & Esteve Ferrer, "The Notion of Argument in Prepositional Phrase Attachment" (*Computational Linguistics*, 32(3), pp. 341-78), discusses the subject. The issue is whether it is possible to determine, for each sense in The Preposition Project (TPP)¹, whether it represents an argument or an adjunct. I think a writeup discussing pro or con is desirable.

The paper is primarily pure computational linguistics, with a lot of statistical analysis. You should be able to skim over the statistics, with only a minor attempt to understand the primary conclusions, and then whether distinguishing between argument and adjunct is possible in definitions of the *Oxford Dictionary of English* (ODE).

What is important is to understand the difference between arguments and adjuncts. Section 2 lays this out by means of diagnostic criteria that a linguist (not a computational linguist) would apply. These, I believe, should be understandable by you as a lexicographer. The next relevant section is 3.3. This section primarily describes the Penn Treebank and how parse constituents (PPs) are labeled. What is most relevant in this section are the places where Quirk is referenced. These references should make it possible for you to put this issue into the familiar perspective of Quirk, and perhaps of most significance, whether the "Quirk syntax" you have been encoding goes to this issue. The final section of relevance is section 4.2, where I think the authors are saying that it is not individual words that are indicative of argument vs. adjunct, but rather word classes (particularly verb classes). (You might also take a look at the appendix which identifies various PP configurations.)

It is important that computational linguists have spent a lot of time viewing verb classes as being primarily defined by their syntactic alternation patterns. I'm not in strong agreement with this approach. ODE takes the stance of putting semantically similar senses together and showing the alternation patterns by using grammar groups and form groups -- see the grammar discussion in the front matter. But, lexicographers at Oxford have been loath to build a verb hierarchy, suggesting that it was not possible. I think it is possible, but haven't done it yet.

¹The Preposition Project is described at <http://www.clres.com/prepositions.html> and the Online TPP available at http://www.clres.com/cgi-bin/onlineTPP/find_prep.cgi.

Analysis:

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Merlo & Esteve Ferrer's (henceforth M&EF) analysis of PPs with regard to their status as arguments or adjuncts is partly consistent with what we have practiced in TPP to date. Their tests for determining whether a given PP is an argument or adjunct seems sound and leaves only a very few cases that might be considered ambiguous for attachment to verbs and nouns, and in cases not involving subjuncts, disjuncts, or conjuncts. Their paper may be helpful as a reference for clarifying some of our data, particularly in cases where I have assigned argument (Quirk 3a) and adjunct (Quirk 2a) status to the same prepositional sense.

An analysis of PPs and preposition behavior in which they were strictly either argument or adjunct is probably possible, and I think this is what M&EF propose, but it is not what ODE does, and not strictly what Quirk does or what FrameNet does. I expect (without taking the time to look at examples) that FrameNet tagging comes closer to matching M&EF's scheme than our classification does, because FrameNet tags for functionality and is verb-driven, whereas we have lumped, conveniently, in the places where ODE does. Take, for example, these sentences:

1. They were seated aboard the cruise ship.
2. They climbed aboard the cruise ship.
3. They answered their correspondence aboard the cruise ship.

All three sentences fall within ODE's (and our) scheme, as representing a single sense: *on or into (a ship, aircraft, train, or other vehicle)*. The critical lumping particle is the word "or." M&EF, however, would (I think) treat these sentences differently, separating them into two camps: the PP in 1 might be an argument or adjunct; in 2 it's an argument, and the PP in 3 is an adjunct. FrameNet would probably be more splitty still: Sentence 1 would probably be assigned to a Frame Element like "Location," 2 would be assigned one like "Motion_Goal," and 3 might be assigned one like "Depictive". For FrameNet, it is the verb (and consequent Frame it suggests) that informs the more specific assignment of the PP.

Because of ODE's inventory, which we have relied on heavily, there are very many cases where a phrase can realize an argument or an adjunct. In nearly all cases, I think the verbal POA is the determiner of this, but ODE does not make this distinction for prepositions.

Furthermore, since we have relied on Quirk's seven categories for classifying the syntactic behavior of prepositions and since these categories overlap imperfectly with M&EF's system, there is not a complete (and therefore easily adoptable) correspondence. If I understand correctly, M&EF's analysis suggests that a postpositive PP can be either

argument or adjunct; Quirk does not make this distinction (probably because “adjunct” is Quirk’s understanding is a function that applies to verbs and VPs).

What is more, M&EF’s analysis, curiously, does not make reference to some of the other syntactic functions noted in Quirk, section 9.1. Their scheme would be more useful overall if it accounted for *all* of Quirk’s syntactic functions. Since they seem to be concerned only with arguments and adjuncts, it is perhaps understandable that they have omitted functions that Quirk identifies as subjunct, disjunct, and conjunct. Leaving these aside for now, my understanding is that a mapping of Quirk to M&EF would look something like this:

Quirk category	Merlo & Esteve Ferrer analysis	Comment
I (postmodifier of a NP)	argument or adjunct, depending on outcome of their diagnostics.	Their numbers 4 and 6 are particularly relevant here. Quirk does not distinguish whether a postpositive preposition is argument or adjunct.
IIa (adjunct)	adjunct of a verb	M&EF diagnostics 1-4 are pertinent
IIb (subjunct)	not treated	point of attachment not often clear
IIc (disjunct)	not treated	point of attachment not often clear
IId (conjunct)	not treated	point of attachment not often clear
IIIa (verb complement)	argument of a verb	M&EF diagnostics 1-4 are pertinent
IIIb (adjective complement)	not treated	See discussion below.

It would also be helpful for M&EF to incorporate in their analysis the attachment of PPs to adjectives. In FrameNet (FN) tagging, an adjective is identified as the attachment point for a preposition far less often than a verb or noun is, but still often enough to represent a substantial percentage of all tagged PPs in the FN data, and it would be illuminating to see where such phrases fit into M&EF’s scheme. I think it’s likely that adjectival attachment would be regarded as an argument in those cases where we have assigned Quirk category IIIb, and as adjunct where we have assigned Quirk IIa (which Quirk illustrates with reference to verbs, but can be seen as applicable to adjectives, especially in cases where the adjective in question is in fact a past participle). For example, in sentences like

1. He was convinced of their sincerity.
2. He was convinced about the need for change.
3. He was convinced beyond a reasonable doubt.
4. He was convinced beyond a reasonable doubt about the need for change.

5. He was convinced during the intermission to leave.
6. He was convinced through bitter experience to abandon the project.

There is no question that *convinced* is the POA for a variety of PPs. There are two approaches here: one is to say that in fact ‘convinced’ is a verb and so identify it for purposes of analysis; the other is to treat it as an adjective (which FN usually does). On the face of it, it seems to be that the PPs in sentences 1 and 2 are arguments, and all others are adjuncts.

It might be interesting to do a sorting that correlates our SRTypes (at the Big Bin level) with argument/adjunct status, as reflected by Quirk status. In fact I think there is probably some correlation between M&EF’s ‘function and semantic’ tags and our Big Bins. The following is more hunch- than analysis-based, and carries a strong proviso: without seeing some of their tagged data I can’t be sure I understand all of their codes because they are not explained that well in the paper; but I think there is probably a high degree of salience as follows:

M&EF Code	Description	Authors deem these	Likely to correlate with our Big Bins
-CLR	dative object if dative shift not possible (e.g., donate); phrasal verbs; predication adjuncts	argument	Tandem, Target
-DTV	dative object if dative shift possible (e.g., give)	argument	Agent, Target
-BNF	benefactive (dative object of for)	argument	Tandem, Target
-PRD	non VP predicates	argument	Activity, Backdrop, Membership, and several others
-PUT	locative complement of put	argument	Spatial
-DIR	direction and trajectory	adjunct	Spatial, Target
-LOC	location	adjunct	Spatial
-MNR	manner	adjunct	Means/Medium
-PRP	purpose and reason	adjunct	Cause, Topic
-TMP	temporal phrases	adjunct	Temporal

M&EF seem to assign all phrasal verbs to their –CLR code. We have seen already in TPP that these verbs are problematic; sometimes their particle parses as a preposition (e.g., when the phrasal verb is transitive and an object is present) and other times the particle is adverbial (e.g. when the phrasal is intransitive). It also happens that a phrasal can be parsed as a verb + PP when instinct tells us that this analysis is not sensible (e.g., a phrasal verb like “look for,” which does not mean look + any analyzable sense of a ‘for’ PP. The grammar coding in ODE that would be of interest here is generally not found at prepositions; it is at verbs. For example, the common “[no obj., with adverbial of

direction]” is very often a code signaling a prepositional phrase. When the phrase is obligatory, it seems likely that this is a case of “argument” as opposed to “adjunct.”

In summary: I think M&EF’s diagnostics may be useful to us for sorting arguments from adjuncts. I can’t say at this point if any exercises aimed at correlating our data with theirs would be useful; we have a great deal to work with at present, and unless their coding and analysis becomes a sort of “industry standard,” further integration with it may be just adding layers of complexity to our work that is already, at times, dauntingly complex.