Meaning and Valency: Representation and Specification

Ash Asudeh[†‡] Gianluca Giorgolo[‡] Ida Toivonen[†]

[†]Carleton University & [‡]University of Oxford

There have been a number of certain recent proposals in the LFG literature (Dalrymple et al. 2004, Asudeh et al. 2008, 2013, Needham and Toivonen 2011, Asudeh and Giorgolo 2012, Toivonen 2013) for the encoding of lexical information and the sharing of this information across valencies in a generalized fashion — including, in some cases, "constructions".[1] This paper has the modest aim of drawing these proposals together in a consistent way, for what could be considered the beginning of a theory of the representation and specification of information that sits at the lexicon–syntax–semantics interface.

We focus particularly on the following issues:

1. **The representation of core semantic information, such that the same lexical entry can be involved in a number of valency realizations**. For example, the verb *eat* can be used transitively, intransitively and in the "*way*-construction", but it has a stable meaning across these uses.

    (1)   The hamster ate a sheet of newspaper this morning.

    (2)   The hamster ate this morning.

    (3)   The hamster ate its way through a sheet of newspaper this morning.

    These examples involve different surface realizations and have distinct overall interpretations, but they all involve an eating event, with the hamster as the agent/eater.

2. **The representation of missing/understood arguments.** For example, the patient of intransitive *eat* in (2) is unrealized, but still understood: The hamster ate *something* this morning. Moreover, there are implicit limits on *what* the hamster is understood to have eaten (hamster food, not newspapers).

3. **The representation of additional/derived arguments.** For example, the verb *sing* does not normally take an object, but it can take a *cognate object*:

    (4)   *The performer sang the children.

    (5)   The performer sang a song.

4. **The possibility of associating meanings with syntactic configurations.** For example, certain verbs that do not inherently have a benefactive reading can receive one if they occur in a double object structure:

    (6)   The performer sang the children a song.

    This example is puzzling given that *sing* cannot take a non-cognate object, as shown above. Similarly, Asudeh et al. (2013) argue that the Swedish "Directed Motion Construction" (Toivonen 2002) involves association of a meaning similar to that of the English *way*-construction with a specific phrase structure configuration.

5. **Templates as generalizations over lexically encoded meaning.** Commonalities across lexical entries can be factored out and stated once only. For example, *eat* and *kick* are both AGENT-PATIENT verbs, but differ in other aspects of their semantics; this is reflected by some shared template calls and some distinct calls. The same technique can capture similarities between verb types like *eat* and *dine* that share core meaning but display distinct valency options.

6. **Templates as the locus of specification of meanings which can be associated with lexical entries or c-structure rules.** A single abstract meaning can be stated for, e.g. *benefactive*, which could be associated with a lexical entry, e.g. *give*, or with a syntactic configuration, such as the double object structure. It then becomes an empirical question which approach gives the more parsimonious description or explanation, but it is not necessary to dispense with the distinction between lexicon and syntax.

Our formal ingredients are the following:

1. Templates

2. Aspects of the regular language of f-descriptions, particularly optionality

3. Resource-sensitive semantic composition, as captured by Glue Semantics

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[1]We intend this term only pretheoretically and do not commit to Construction Grammar.

These are all standard parts of LFG theory, with the possible exception of templates, but even these are just extensionally equivalent to f-descriptions and therefore add no expressive power.

The following schematic lexical entry for *ate* illustrates:

(7)   *ate*   V $(\uparrow$ PRED$) =$ 'eat'
                                  eat':REL$_\sigma$
                                  (@AGENT-PATIENT$_\sigma$)
                                  (@UNDERSTOOD-OBJECT-MODIFIER$_\sigma$)

The only obligatory meaning constructor is the constructor that specifies the core meaning. The other meaning templates are optional. The resource-sensitivity of semantic composition in Glue ensures that neither optional meaning template can be selected for, e.g. (3); that only the AGENT-PATIENT template is additionally possible for, e.g. (1); and that both optional templates are required for, e.g. (2).

In general, templates for optional semantic resources will be functions that work on the (possibly partially saturated) core semantic resource by changing its valency. For example, in the case of missing arguments the template will change the type of the core predicate from a binary relation to a unary predicate, existentially binding the object argument. In contrast, in a case like (5), the optional resource specified for *sang* should change the type of the core semantic resource by adding an argument, possibly a dummy one, but also checking for specific semantic properties of the cognate object (e.g. the added argument must be something that can be sung).

Notice that our use of optional semantic resources is different from an approach that simply lists alternative lexical entries for each use of the verbs under discussion. In fact, we can exploit the projective nature of the LFG architecture to deterministically activate the optional resources, making them dependent on specific syntactic configurations. The idea is to impose checks on the syntactic representations at the stage at which we instantiate the semantic resources for the Glue derivation. For example, in the case of the lexical entry for *ate*, we can restrict the introduction of the resources instantiated from the template UNDERSTOOD-OBJECT-MODIFIER to the cases in which the corresponding f-structure of the verb lacks an OBJ feature.

In short, the intuition behind our approach is that the lexicon is a "web of meaning" (Asher 2011): all and only the possible meanings are selected, depending on the grammatical context. We further explore the possibility of generalizing even further away from lexical control of meaning, through more pervasive association of meaning with phrase structure. Lastly, we compare our approach to the recent lexical rules approach of Müller and Wechsler (to appear); we argue that our approach is in principle both more theoretically parsimonious and empirically accurate.

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