Tracking the Dependencies of Dependencies

Niina Ning Zhang
National Chung Cheng University Lngnz@ccu.edu.tw

I. Four basic syntactic dependencies

Considering three constructions, i.e., the combination of a transitive verb (Vtr) and its object N, the combination of an adjective and its modifiee N, and the combination of a determiner and an N, we list four basic syntactic dependencies in (1). The subscribed element depends on the other element (i.e., the dominant one) with respect to the relation labeled in the top row.

(1)

construction	projection relation	ϕ relation	case relation	occurrence relation
[Vtr N]	V_N	$_V N$	V_N	$_V N$
[Adj N]	$_{Adj} N$	$_{Adj} N$	$_{Adj} N$	$_{Adj} N$
[Det N]	Det_N	$_{Det} N$	Det_N	$_{Det} N$

(2) a. On les a repeint-es. [French]
one them has repainted-FEM.PL
'We repainted them.'

b. gut-er Tee
good-MSC.NOM tea.MSC.NOM
'good tea'

c. gut-en Tee-s [German]
good-MSC.GEN tea-MSC.GEN
'good tea'

d. Sie öffnete die Tür. [German]
she opened Det.FEM.SG.ACC door.FEM.SG.ACC.
'She opened the door.'

The projection relation means that the syntactic category of the dominant element is the category of the mother (e.g., Chomsky 2008: 145). In (2b), for instance, the nominal category of *Tee* is the category of the whole nominal expression *guter Tee*.

The ϕ relation (ϕ-agreement) means that the ϕ features of an element depend on those of the dominant element. In (2a), the feminine and plural features of the verb *repeint-es* correlate with the same ϕ features of the object *les*. In all sign languages, the ϕ-like features (classifiers) of transitive verbs also depend on those of the objects (Sandler & Lillo-Martin 2006). In (2b) and (2c), the masculine feature of the adjective correlates with the same feature of the noun *Tee*(*s*). In (2d), the feminine and singular feature of the determine *die* correlate with the same ϕ features of the noun *Tür*.

The case relation means that the case feature of an element is determined by the dominant element. In (2a), for instance, the accusative case of the object *les* is determined by the verb *repeint-es*. In (2d), the accusative case of the noun *Tür* is determined by the case feature of the determiner *die* (, which is in turn determined by the verb *öffnete*).

The occurrence relation means that the occurrence of an element depends on the occurrence of the dominant element. In (2a), the transitive verb *repeint-es* needs to occur with its object, *les*, but not vice versa. Thus *les* is the dominant element. In (2b)/(2c), the adjective needs to occur with the noun, and in (2d), the determiner needs to occur with the noun.

II. Tracking the dependencies of the syntactic dependencies

From (1), we can see that the dependency direction is the same for the projection relation and the case relation, and the dependency direction is the same for the ϕ relation and the occurrence relation. We thus get the following generalizations:

(3) a. X depends on Y in the ϕ relation if its occurrence also depends on Y.
b. X depends on Y in the case relation if it also depends on Y in the projection relation.

The correlation in (3a) is also attested in the fact that a predicate agrees with its subject in ϕ-features and also requires the presence of the subject. The correlation in (3b) is also attested in the fact that in English when the finite Infl merges with a (raised) subject, it determines the nominative case of the subject and also projects IP.

While the occurrence and projection relations are universal, the ϕ and case relation are not universal. Languages such as Chinese have the first two relations, but not the latter two.

III. Tracking the dependencies of the syntactic and non-syntactic dependencies

3.1 Projection and occurrence dependencies

Among the syntagmatic relations listed in (1), the projection relation is a pure syntactic one. Category identity between the mother and one of the two different daughters is not seen in phonology or semantics. As for occurrence dependency, it is also seen in phonology and semantics. For instance, in a onset-rime string, the occurrence of the former depends on the occurrence of the latter. In semantics, the occurrence of a predicate-denoting element such as a relational noun depends on the occurrence of another element that can function as a subject.

3.2 ϕ dependency

The ϕ relation (i.e., ϕ-agreement), as a feature-spreading effect, is similar to assimilation in phonology, and should thus be treated as an instance of the more general Agree operation in both phonology and syntax (see Nevins 2010).

3.3 Case dependency

There are two kinds of case dependency: the agreement type and the government type. In the former, as seen in [Adj N] and [Det N] constructions, the case feature of the dominant element is spread to the non-dominant one (2b, c, d). Like ϕ-agreement, the case-agreement should be treated as an instance of the more general Agree operation in both phonology and syntax.

The other kind of case relation (i.e., government) is special in the sense that there is no sharing of the relevant feature between the dominant and the dependent element. When a verb requires its object to have a genitive case, for instance, the verb itself does not bear a genitive case. This kind of asymmetry is parallel to selection. When a verb requires its object to have the feature of [+ liquid], the verb itself does not bear the feature of [+ liquid]. Similarly, when a verb requires its complement to be a DP rather than CP (e.g., *capture*, *express*), the verb itself has no D feature. In this sense, we can treat government as a kind of formal feature selection. Government is thus case-selection, parallel to c-selection and s-selection.

If X selects Y, X is saturated by Y, in forming an acceptable combination (see Branigan 2011: 12). This kind of relation is also seen in semantics (e.g., type logic). For instance, an element of the type <e, t> needs to be saturated by an element of the type <e>, and a collective predicate needs to be saturated by an argument that denotes a plural entity (also see Pustejovsky 1995: 3, 19). In this sense, government should be treated as an instance of the more general saturation operation in both semantics and syntax (or morphology).

IV. Summary

If X depends on Y for its ϕ features, it also depends on Y for its occurrence; if X projects its categorial features when it merges with Y, it also determines the case feature of Y.

Projection relation is syntactic, ϕ and case agreement is an instance of the more general Agree operation in both phonology and syntax, government is an instance of the more general feature-saturation operation in both semantics and syntax, and co-occurrence relation is a general relation in all components of language.

References

Branigan, Phil. 2011. *Provocative syntax*. Cambridge, MA: MIT Press. Chomsky, Noam. 2008. On phases. In Robert Freidin, Carlos P. Otero, and Maria Luisa Zubizarreta, eds., *Foundational Issues in Linguistic Theory*, 133-166, Cambridge, MA: MIT Press. Nevins, Andrew. 2010. *Locality in Vowel Harmony*. Cambridge, MA: MIT Press. Pustejovsky, James. 1995. *The generative lexicon*. Cambridge, MA: MIT Press. Sandler, Wendy & Diane Lillo-Martin. 2006. *Sign Language and Linguistic Universals*. Cambridge: Cambridge University Press.