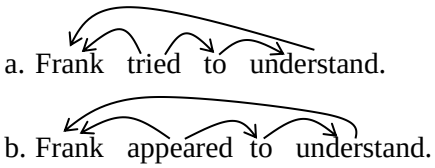
Most DGs conceive of syntactic structure in terms of trees. Trees are not a necessity, however. When a dependency grammar allows a given word to have more than a single parent word, it assumes networks. Word Grammar (e.g. Hudson 1990) is perhaps the most prominent DG to assume networks. The Word Grammar analysis of control and raising structures is along the following lines:

(13)

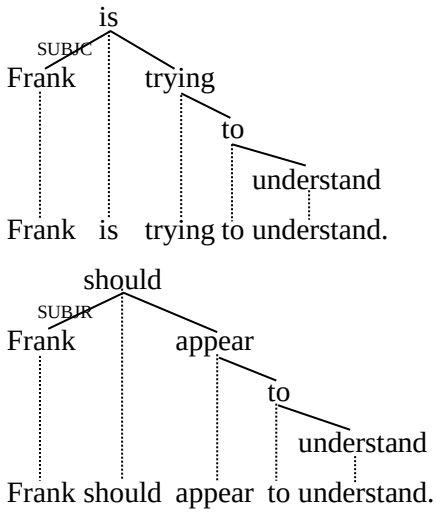


The fact that *Frank* is the logical subject of both the matrix and the embedded predicate is indicated directly in these cases by the fact that both *tried/appeared* and *understand* are shown as the parent of *Frank*.

While these networks accommodate the fact that *Frank* is the valent of two predicates at the same time, the presence of the additional dependency does not alone distinguish between control and raising. Something more is needed to this end. This necessity brings the discussion to the second option, namely an augmented inventory of syntactic relations.

Many DGs take the syntactic relations to be primitive and grant them an important role in the theory of syntax. In this regard, the distinction between control and raising might be addressed in terms of an augmented list of syntactic relations – cf. Mel'čuk and Persov (1987). The additional relations would be such that they would discern when control or raising is present. One might, for instance, posit distinct syntactic relations along the following lines (SUBJC = subject control, SUBJR = subject raising):

(14)



The presence of the labels indicating the pertinent syntactic relations in these two cases would discern and distinguish between control and raising. Note, however, the presence of the auxiliary verbs, *is* in (14a) and *should* in (14b). Their presence combined with the fact that the subject is an immediate dependent of the finite verb obscures the insight that it is the content verbs *tried* and *appeared* that are responsible for the presence of the syntactic realtions SUBJC and SUBJR.

The points just established reveal difficulties associated with the first two options for discerning and distinguishing between control and raising in dependency syntax. The first option, i.e. networks, is rejected here in part because we believe trees are a simpler and more principled basis for dependency syntax. The second option, i.e. an augmented inventory of syntactic relations, is also deemed insufficient for capturing the distinction between control and raising because they alone do not make clear that control and raising phenomena are closely linked to specific predicates.

The third option, namely valency frames, avoids networks at the same time that it it ties control and raising closely to specific predicates. The discussion now turns to these valency frames.

6 Valency frames

There is a long tradition of using valency frames, especially in the German language literature. In German, a valency frame is often called a *Satzmuster* 'sentence pattern'. Dictionaries of German provide dozens of Satzmuster as a guide to correct use of verbs and adjectives (and other types of predicates), e.g. *dtv Wörterbuch der deutschen Sprache* (1978: 30–3). To my knowledge, however, these dictionaries do not distinguish between control and raising predicates in a consistent and principled manner. The discussion here henceforth demonstrates how these frames can distinguish between control and raising predicates in English.

Table 3 gives the symbols employed in the valency frames below. The table is intended to serve as a quick reference guide to the valency frames introduced and discussed further below.

Symbol	What the symbol means
$_{a}$	Marks an argument valent; the absence of this subscript indicates that the valent is not an argument of its governor

f, nf	valency frame given is valid for the finite/nonfinite form of the verb
N	Nominal (noun, pronoun, or noun phrase)
Pa	(Passive) perfect participle, e.g. *eaten, understood, worked*
T	*to*-infinitive phrase, e.g. *to stay*
R	R indicates that that valent is to be understood in terms of **raising**; the valency carrier does not syntactically select that valent
N, **N**	Single underline marks that valent as the subject argument of a predicate lower in the structure; double underline marks that valent as the object argument of a lower predicate
↑	Up-arrow indicates that the valent does not appear as a dependent of the predicate, but rather it appears elsewhere in the structure or situational context

The valents of a predicate are enclosed in square brackets […] and the predicate itself is put in small caps and positioned to the immediate left of the brackets, e.g. *Harry loves Harriet* – LOVE$_f$ [N$_a$, N$_a$].

The machinery given in the table is just enough to address control and raising and distinguish between them. The list of categories and labels necessary for a full account of valency patterns in English would be much larger, of course.

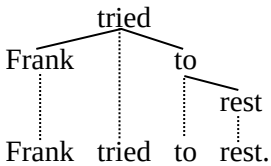
7 *To/from*-subject predicates

The following four subsections provide examples of the four types of control and raising predicates already mentioned above. These predicates have the/a matrix valent serving as the subject argument of the embedded predicate. In order to have more space for the discussion for the more controversial types of control and raising discussed in Section 8, the discussion in this section is very brief.

7.1 S-to-S control

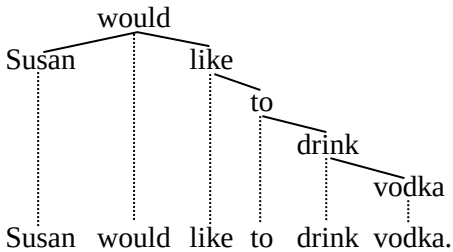
S-to-S control predicates are numerous and they occur frequently. Both verbs and adjectives can establish S-to-S control, e.g.

(15)



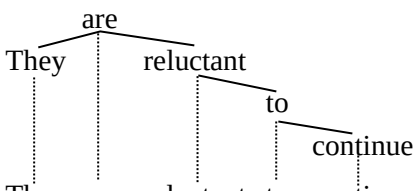
a. Frank tried to rest.
b. TRY$_F$ [N$_a$, T$_a$]

(16)



a. Susan would like to drink vodka.
b. LIKE$_{nf}$ [N$_a$↑, T$_a$]

(17)



a. They are reluctant to continue.
b. RELUCTANT [N$_a$↑, T$_a$]

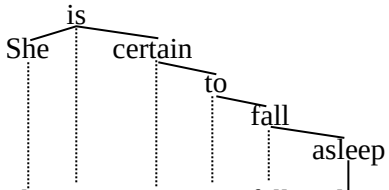
The single underline under N marks that valent as controlling the embedded *to*-infinitive predicate. Hence the single underline marks that valent as the understood subject valent of the *to*-infinitive. The up-arrow in (16b) indicates that that valent is not a dependent of the nonfinite *like*, but rather it appears higher in the structure – in this case, as a dependent of the root verb *would*.

The up-arrow is a convention that helps characterize the primary combinatory difference between finite verbs and other nonfinite forms of predicates. For the use of similar means to indicate that the subject valents are typically not dependents of nonfinite forms, see Heringer (1996: 44, 62) and Starosta (2003: 275–6).

7.2 S-from-S raising

S-from-S raising also occurs with both verbs and adjectives, e.g.

(18)



a. She is certain to fall asleep.
b. CERTAIN [R↑, T$_a$]

(19) a. The fridge is threatening to explode.
b. THREATEN$_{nf}$ [R↑, T$_a$]

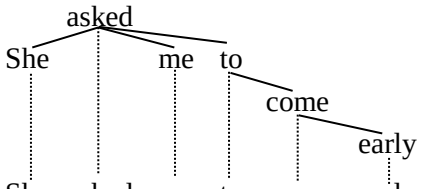
(20) a. They are unlikely to succeed.
b. UNLIKELY [R↑, T_a]

These valency frames differ from those just given in the previous section regarding the presence of R and the absence of the $_a$ subscript on R. The R indicates that that valent is not syntactically selected by its parent, and the absence of the $_a$ subscript always indicates that that valent is also not semantically selected by its parent. At the same time, the single underline continues to indicate that that valent serves as the subject argument of the embedded infinitival predicate.

7.3 O-to-S control

O-to-S control predicates are also numerous, and they occur frequently as well. Examples follow:

(21)



a. She asked me to come early.
b. ASK$_f$ [N_a, $\underline{N}_a$, T_a]

(22) a. They have forced him to try it.
b. FORCE$_{nf}$ [N_a↑, $\underline{N}_a$, T_a]

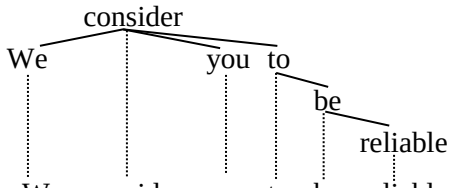
(23) a. Jill told us to start immediately.
b. TELL$_f$ [N_a, $\underline{N}_a$, T_a]

The object now controls the embedded *to*-infinitive, functioning as its subject argument. The single underline continues to indicate that that valent serves as the understood subject valent of the embedded predicate.

7.4 O-from-S raising

O-from-S raising predicates have the matrix object, as opposed to the matrix subject, being semantically selected by the embedded nonfinite predicate. Only verbal predicates can do this, e.g.

(24)



a. We consider you to be reliable.
b. CONSIDER$_f$ [N_a, $\underline{R}$, T_a]

(25) a. They will need us to help them.
b. NEED$_{nf}$ [N_a↑, $\underline{R}$, T_a]

(26) a. He wants them to leave.
b. WANT$_f$ [N_a, $\underline{R}$, T_a]

The R and the absence of the $_a$ subscript on the R are again the means by which raising is indicated. The single underline continues to show that that valent serves as the subject valent of the embedded predicate.

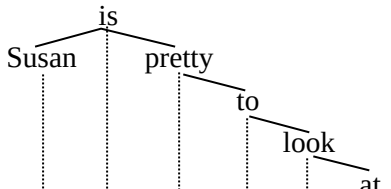
8 To/from-object predicates

The following four subsections consider S-to-O and O-to-O control predicates as well as S-from-O and O-from-O raising predicates. The extent to which the predicates discussed are indeed control or raising predicates is less acknowledged and/or controversial. This, then, is arguably the merit of the current account; it discerns generalizations about control and raising predicates that have been overlooked.

8.1 S-to-O control

The typical S-to-O control predicates is an adjective, e.g. *available*, *fit*, *heavy*, *light*, *pretty*, *ready*, *soft*, *tasty*, *ugly*, *unavailable*:

(27)



a. Susan is pretty to look at.
b. PRETTY [$\underline{\underline{N}}_a$↑, T_a]
c. *It is pretty to look at Susan.

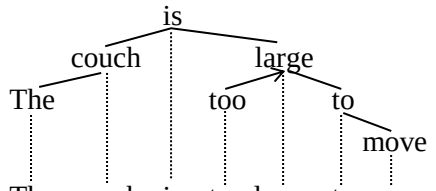
(28) a. These nuts are tasty to snack on.
b. TASTY [$\underline{\underline{N}}_a$↑, T_a]
c. *It is tasty to snack on these nuts.

(29) a. This coat is soft to touch.
b. SOFT [$\underline{\underline{N}}_a$↑, T_a]
c. *It is soft to touch this coat.

The unacceptability of the c-sentences here reveal that *pretty*, *tasty*, and *soft* are not raising predicates. The b-examples show how the combinatory potential of these predicates is captured in valency frames. The double underline marks the subject valent as controlling an object that appears lower in the structure. The fact that the subject N bears the $_a$ subscript indicates that raising is not involved.

An interesting aspect of S-to-O control is that many adjectives can be coerced into becoming such predicates by the appearance of *too*, e.g.

(30)



a. The couch is too large to move.
b. TOO LARGE [$\underline{\underline{N}}_a\uparrow$, T_a]

(31) a. Tom is too clever to fool.
b. TOO CLEVER [$\underline{\underline{N}}_a\uparrow$, T_a]

(32) a. This essay is too long to read.
b. TOO LONG [$\underline{\underline{N}}_a\uparrow$, T_a]

Without *too*, the adjectives *large*, *clever*, and *long* are not control predicates. The ability of the degree adverb *too* to coerce adjectives that alone are not control predicates is also true in cases of S-to-S control, e.g.

(33) a. Frank is too lazy to get up early.
b. TOO LAZY [$\underline{\underline{N}}_a\uparrow$, T_a]

(34) a. Larry is too slow to catch us.
b. TOO SLOW [$\underline{\underline{N}}_a\uparrow$, T_a]

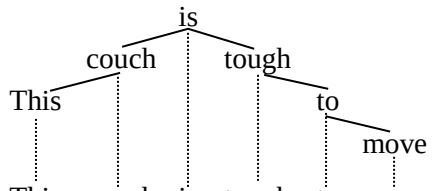
(35) a. Harriet is too careful to get caught.
b. TOO CAREFUL [$\underline{\underline{N}}_a\uparrow$, T_a]

The combinatorial difference across (30–32) and (33–35) is captured with the underlines, double vs. single.[3]

8.2 S-from-O raising

S-from-O raising is more widely known under the rubric of *tough-movement* – a reference to the adjective *tough* as the typical predicate that licenses such movement (e.g. McCawley 1998: 107–10, Culicover and Jackendoff 2005: 342–47). The double underline again serves to indicate that the valent serves as the object of a lower predicate, e.g.

(36)



a. This couch is tough to move.
b. TOUGH [$\underline{\underline{R}}\uparrow$, T_a]
c. It is tough to move this couch.

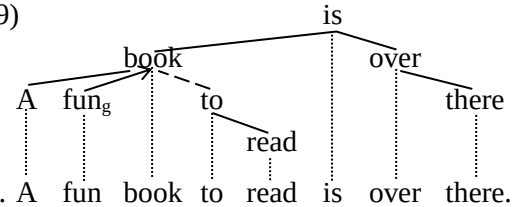
(37) a. The floor is easy to clean.
b. EASY [$\underline{\underline{R}}\uparrow$, T_a]
c. It's easy to clean this floor.

(38) a. A break is good to get.
b. GOOD [$\underline{\underline{R}}\uparrow$, T_a]
c. It's good to get a break.

The double underline shows that that valent serves as the object of the/a predicate appearing lower in the structure. The R and the absence of the $_a$ subscript on the R valent indicate that that valent is neither syntactically nor semantically selected by the predicate.

The valency frames just introduced to capture the combinatory potential of S-from-O raising are also capable of characterizing these predicates when they are used attributively – although an additional assumption is necessary, e.g.

(39)



a. A fun book to read is over there.
b. FUN [$\underline{\underline{N}}\uparrow$, T_a]

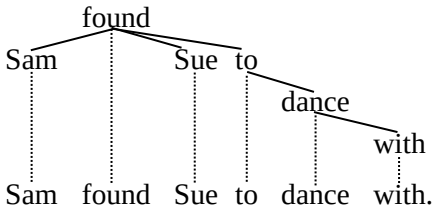
The attributive adjective *fun* clearly governs the *to*-infinitive *to read*. The word order is such, however, that a non-projective structure should obtain due to the intervening noun *book*. To overcome this non-projective structure, rising is assumed, as indicated with the dashed dependency edge and the $_g$ subscript (see Groß and Osborne 2009). Note that in such cases of a predicate used attributively, the up-arrow in the valency frame continues to capture the fact that the subject valent of the predicate is not a dependent of that predicate. Note also that the R valent does not occur. In cases of attributive use, the subject valent is always a nominal.

8.3 O-to-O control

Cadidates for an analysis in terms of O-to-O control are listed next: *bring*, *build*, *buy*, *create*, *find*, *give*, *take*, e.g.

[3] An anonymous reviewer points out that combinations such as *too large*, *too lazy*, etc. are not stored in the lexicon as single lexical items and that an account of such data in terms of valency is hence problematic. This matter is open issue.

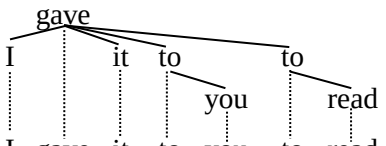
(40)



a. Sam found Sue to dance with.

b. FIND$_f$ [N$_a$, N$_a$, T]

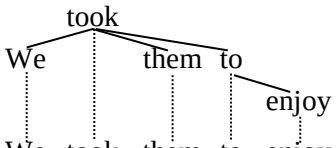
(41)



a. I gave it to you to read.

b. GIVE$_f$ [N$_a$, N$_a$, toN$_a$, T]

(42)



a. We took them to enjoy.

b. ENJOY$_f$ [N$_a$, N$_a$, T]

The flatness of structure here is motivated by diagnostics for constituents – see examples (6–9). These diagnostics reveal that, for instance, *Sue to dance with* in (40) is not a constituent, e.g. topicalization: **...and Sue to dance with Sam found*; clefting: **It is Sue to dance with that Sam found*. In addition, we know that the *to*-infinitive phrases are not dependents of the objects *Sue*, *it*, and *them* because definite nouns and pronouns do not typically take dependents. Furthermore, the fact that *to read* in (41a) is separated from *it* by *to you* refutes the notion that *it* and *to read* could form a constituent (i.e. a complete subtree).

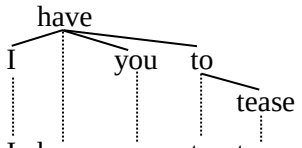
Another noteworthy aspect of these examples is the absence of $_a$ subscript on the T valent. This indicates that those valents are not arguments of the parent predicate; they are, rather, secondary predications the presence of which is optional. Their actual status is a difficult issue (valent or adjunct?) that cannot be addresssed here appropriately due to limited space.

Finally, observe that control is doubly present in these cases, since the subject of the *to*-infinitive is also a matter of control – although of nonobligatory control, as example (41a) reveals, where the understood subject of the *to*-infinitive is the *to*-argument, not the subject. That nonobligatory control is involved is also evident in the fact that insertion of a *for*-phrase in these examples can shift the controller from the subject to the object of *for*, e.g. *For the kids, we took the snacks to enjoy* – the kids will enjoy the snacks.

8.4 O-from-O raising

The final type of raising is O-from-O raising. This type of raising occurs infrequently. We are aware of just a couple of verbs that qualify as such predicates: *have*, *get*, and *want*, e.g.

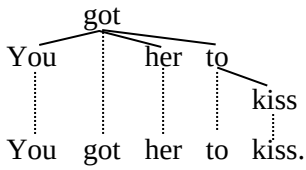
(43)



a. I have you to tease.

b. HAVE$_f$ [N$_a$, R, T$_a$]

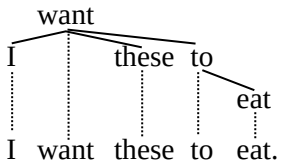
(44)



a. You got her to kiss.

b. GET$_f$ [N$_a$, R, T$_a$]

(45)



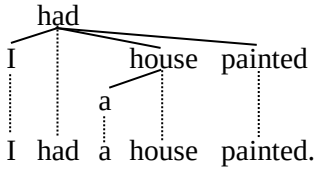
a. I want these to eat.

b. WANT$_f$ [N$_a$, R, T$_a$]

Observe as well that the object R in these examples is a definite pronoun. This fact again supports the flat analysis shown, since it contradicts the alternative analysis that positions the *to*-infinitive as a dependent of the object – definite pronouns do not accept postdependents. Observe that as with the examples of O-to-O control in the previous section, nonobligatory subject control is also present in these examples. We again know that control is pragmatically determined in such cases because it is possible to vary the understood subject of the *to*-infinitive, e.g. *For my kids, I want these to eat*.

Another interesting aspect of these predicates is that they also alternatively license O-from-S raising, e.g.

(46)



a. I had a house painted.

b. have$_f$ [N$_a$, R, Pa$_a$]

(47) a. I got my paper corrected.

b. GET$_f$ [N$_a$, R, Pa$_a$]

(48) a. They wanted it revised.

b. WANT$_f$ [N$_a$, R, Pa$_a$]

Used in this way, the predicates *have*, *get*, and *want* no longer involve control. The appearance of the passive participle forces the account to assume that the object functions as the subject of the embedded participle, rather than as its object.

9 Conclusion

This contribution has presented a DG account of obligatory control and raising. Due to the minimal nature of dependency structures, the distinction cannot be captured in the hierarchy of words; it can, rather, be captured in valency frames. The valency frames introduced here distinguish between control and raising mainly via the presence/absence of the $_a$ subscript and the R valent. When $_a$ subscript is absent, the valent is not semantically selected by the predicate. A particular merit of the approach is its ability to distinguish between various types of control and raising predicates, eight in all.

References

Andrew Carnie. 2013. *Syntax: A Generative Introduction*, 3rd edition. Wiley-Blackwell, Malden, MA.

Noam Chomsky. 1981. *Lectures on Government and Binding: The Pisa Lectures*. Foris Publications, Dordrecht.

Peter Culicover and Ray Jackendoff. 2005. *Simpler Syntax*. Oxford University Press.

dtv Wörterbuch der deutschen Sprache. 1978. Herausgegeben von Gerhard Wahrig. Deutscher Taschenbuch Verlag GmbH, München.

Ulrich Engel. 1994. *Syntax der deutschen Gegenwartssprache*, 3rd fully revised edition. Erich Schmidt, Berlin.

Hans-Werner Eroms. 2000. *Syntax der deutschen Sprache*. de Gruyter, Berlin.

Thomas Groß and Timothy Osborne. 2009. Toward a practical dependency grammar theory of discontinuities. *SKY Journal of Linguistics* 22, 43–90.

Liliane Haegeman. 1991. Introduction to Government .& Binding Theory. Blackwell, Oxford, UK.

David G. Hays. 1964. Dependency theory: A formalism and some observations. *Language* 40, 511–25.

Hans Jürgen Heringer. 1996. *Deutsche Syntax Dependentiell*. Staufenberg, Tübingen.

Richard Hudson. 1990. *English Word Grammar*. Basil Blackwell, Oxford, UK.

Jürgen Kunze. 1975. *Abhängigkeitsgrammatik. Studia Grammatica* 12. Akademie Verlag, Berlin.

James McCawley. 1998. *The Syntactic Phenomena of English*, 2nd ed. The University of Chicago Press.

Igor Mel'čuk and Nikolai Pertsov. 1987. *Surface syntax of English: A formal model with the Meaning-Text Framework*. John Benjamins, Amsterdam.

Klaus Schubert. 1987. *Metataxis: Contrastive dependency syntax for machine translation*. Foris Publications, Dordrecht.

Stanley Starosta. 2003. *Dependency grammar and lexicalism*. In Vilmos Ágel et al. (eds.), *Dependency and Valency: An International Handbook of Contemporary Research*, vol. 1, pp. 270–81. Walter de Gruyter, Berlin.

Kalevi Tarvainen. 1981. *Einführung in die Dependenzgrammatik*. Max Niemeyer Verlag, München.

Lucien Tesnière. 1959. *Éléments de syntax structurale*. Klincksieck, Paris.

Lucien Tesnière. 2015 (1959). *Elements of structural syntax*, translated by Timothy Osborne and Sylvain Kahane. John Benjamins, Amsterdam.