

Control phenomena

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1. Introduction

Control, as the term is generally understood in syntax, concerns the interpretation of non-finite clauses such as infinitivals or gerunds.¹ It may be defined as a coreference relation between the understood subject of a non-finite clause and some other element that provides its interpretation. This element is called its controller. Some different types of controller are illustrated in (1):

- (1) a. They asked him to leave the party.
- b. By working extra shifts she could finally afford that trip.
- c. To be honest, it is worth a lot more.

In the ditransitive structure in (1a), the understood subject of *leave the party* is controlled by the matrix object *him*; and in the initial adjunct of (1b), the understood subject of *working extra shifts* is controlled by the matrix subject *she*. In (1c), there is no syntactically realized controller, since the understood subject of *be honest* is controlled by the speaker (or writer).

The controlled element, the understood subject, is often referred to as PRO and represented as such in linguistic examples (e.g., *They_i asked him_j to PRO_j leave the party*). In some generative frameworks, this PRO is assumed to correspond to an invisible pronoun. For expository reasons, I will henceforth follow the common practice of representing the controlled element as PRO. I will not, however, subscribe to the assumption that it marks an actual invisible pronoun, but rather aim at a theory-neutral a presentation as possible.

An often recognized distinction among control structures is the one between obligatory and non-obligatory control. This distinction has been pictured in many

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1. The term *control* has also been applied to event semantics. This notion of control is employed in Dik's (1997) Functional Grammar as a State of Affair feature.

different ways, but a fairly representative definition is that “[t]he controller and the infinitive must be clausemates” (Landau 2000: 3; for a more elaborate definition, see, e.g., Williams 1980: 209). Thus, (1a) is a typical example of obligatory control, and (1c) a clear case of non-obligatory control (although the interpretation of speaker control is of course obligatory in some sense). As for adjuncts such as the one in (1b), their status with respect to this distinction is less clear; we will return to this issue in Section 3.

Another central distinction is the one of “ordinary” control patterns versus so-called arbitrary control, essentially a distinction between control and non-control. Arbitrary control refers to cases where there is no controller and PRO instead receives a generic or arbitrary interpretation, as illustrated in (2):

- (2) a. PRO_{arb} Playing golf is good for you.
 b. John is easy to PRO_{arb} talk to.

Both sentences in (2) are presented as general statements, supposedly meant to be true for anyone playing golf or anyone talking to John, respectively. In other words, there is no controlling referent, and PRO is assigned generic or arbitrary reference. As is the case with other generic expressions (e.g., the pronoun *one*), the context may provide a more specific reading, often associated with the speaker, but the expressions as such do not call for a specific interpretation of PRO. Notice the contrast with (1c), where there clearly is a controller, although not linguistically realized. Arbitrary control will be treated further in Section 4.

Finally, control should be distinguished from so-called raising structures. Compare the sentence pairs (3a–b) and (3c–d):

- (3) a. They asked Mary_i to PRO_i sing at the reception.
 b. They heard Mary sing at the reception.
 c. Mary_i promised to PRO_i handle the situation just fine.
 d. Mary seemed to handle the situation just fine.
 e. It seemed Mary handled the situation just fine.

The difference, indicated by there being no PRO in (3b) or (3d), has to do with semantic roles. In (3a), Mary fills two semantic roles, both as askee (Patient of *asked*) in the matrix and as singer (Agent of *sing*) in the subordinate infinitive (cf. the finite variant *They asked Mary if she could sing at the reception*, where each role is expressed separately). In (3b), by contrast, Mary plays no semantic role in the matrix clause. The Theme of *heard* consists of the whole string [Mary sing at the reception], and thus Mary fills a semantic role only in relation to the subordinate predicate (cf. *They heard that/how Mary sung at the reception*).

The same kind of difference concerns (3c–d); again, Mary fills two semantic roles in (3c) but only one in (3d). In (3c) she is both promiser (Agent of *promised*) and handler (Agent of *handle*) (cf. *Mary promised that she would handle the situation just*

fine). In (3d), although Mary is the grammatical subject of *seemed*, she does not fill any semantic role with respect to it (there is no such thing as a “seemer”). Instead, the Theme of *seemed* is [Mary handle the situation just fine], as illustrated in (3e), where there is an expletive subject and the whole Theme is expressed as a complement.

Thus, control is a relation between distinct elements, whereas raising is not. Regardless of whether PRO is assumed to be an invisible subject or merely a feature of the verb, it corresponds to a semantic role separate from that of its controller.²

There is a large theoretical literature on control, primarily focusing on obligatory control and how to account for it within a certain framework. Most syntactic frameworks have their own sub-theories of control, such as Manzini (1983) for Government & Binding, Hornstein (1999) and Landau (2000) for the Minimalist Program, Bresnan (1982) for Lexical-Functional Grammar, and Sag & Pollard (1991) for Head-Driven Phrase Structure Grammar, to name but a few. An overview of the development of control theories within Chomskyan grammars is given in Davies & Dubinsky (2004). I will not review these various proposals here, since this is an overview article on control *phenomena* rather than control *theories*. Examples will be mainly taken from English and to some extent Swedish. The latter language is included due to the availability of a comprehensive corpus study of control phenomena in Swedish (Lyngfelt 2002), including some patterns that are often disregarded in the control literature.³

2. Complement control – object clauses

The control issue that has been most thoroughly treated in the theoretical literature is complement control, in particular the obligatory control of non-finite object clauses (other complement types will be addressed in Sections 2.2 and 5). The basic descriptive generalizations are the following. In monotransitive structures, PRO is normally controlled by the matrix subject, as in (4a). In ditransitive structures, PRO is usually controlled by the matrix object, as in (4b) – except for some verbs, notably *promise*, where it is rather controlled by the matrix subject, as in (4c):

- (4) a. I_i hate to PRO_i admit it.
 b. She_i persuaded him_j to PRO_j stay.
 c. She_i promised him_j to PRO_i stay.

2. There have been proposals to collapse the distinction between control and raising (e.g., Hornstein 1999). I will not go into this debate here (cf. some of the papers in Davies & Dubinsky 2007), but merely observe that most accounts of control maintain this distinction.

3. Lyngfelt (2002) is written in Swedish. For a preliminary presentation in English, see Lyngfelt (2000).

The various theories proposed to account for obligatory control in verb complements are essentially of two types: configurational or semantic/lexicalist. Configurational accounts, following Rosenbaum (1967), are typically based on the so-called Minimal Distance Principle (MDP), according to which PRO is controlled by the closest NP higher in the phrase structure (in generative terms, the closest “c-commanding” NP). In sentences such as (4a), the subject is closest and hence, the controller. In ditransitives, there is an intervening object, usually resulting in object control as in (4b) – but not in (4c). Thus, MDP accounts for the dominating patterns of subject control in simple transitive structures and of object control in ditransitives, but leaves *promise* as a lexical exception.

On the semantic/lexicalist approach, first pursued by Jackendoff (1972), these control patterns are essentially semantic and depend on the meaning of the matrix verb. In other words, the verbs in (4) do not only select for the number and types of arguments they are construed with but also for the control relations associated with these arguments. Assuming it follows from the verb *hate* that it takes an infinitival complement in (4a), it also follows from the *meaning of hate* that this complement receives subject control. Of the ditransitive structures, the meaning of *persuade* specifies object control in (4b) whereas the meaning of *promise* yields subject control in (4c). Lyngfelt (2002) introduces the term *orientation* for this aspect of verb meaning; verbs like *promise* are oriented towards the subject, and verbs like *persuade* are oriented towards the object (cf. also Sag & Pollard 1991; Culicover & Jackendoff 2005). Verbs with similar meanings display similar control patterns in other languages as well.

Both the configurational and the lexicalist approach are well attested in the literature, although it may be that the configurational approach has been losing ground lately. Even from a Minimalist perspective, a tradition usually favoring configurational solutions, Landau (2000) concludes

Overall, the MDP is untenable, and the question of controller choice (inside the O[bligatory] C[ontrol] domain) is best handed over to semantic/pragmatic considerations. (Landau 2000: 24)

2.1 Control shift

One of the main arguments for a semantic approach to complement control concerns control shift (or *coercion*, cf. Sag & Pollard 1991). This notion pertains to cases where the control patterns usually associated with certain verbs are reversed, as illustrated in (5):

- (5) a. He_i begged her_j to PRO_j give a talk.
 b. He_i begged her_j to PRO_i be allowed to give a talk.
 c. She_i promised him_j to PRO_i play a few songs at the party.
 d. She_i promised him_j to PRO_j get to play a few songs at the party.

Verbs like *beg* are object-oriented and thus usually occur with object control, as in (5a), but can under certain circumstances get subject control, as in (5b). Conversely, a subject-oriented verb like *promise* (cf. (5c)) may occasionally be construed with object control, as in (5d). In both (5b) and (5d), the control relation is shifted, at least from a syntactic perspective, since PRO associates with a different element than expected.

However, the orientation of the matrix verbs does not shift, and neither do the semantic control relations. It is still the expected controllers who are *in* control of the subordinate events. In (5b), the object of *beg* (i.e., *her*) is not coreferential with the syntactic subject (PRO) of *be allowed* but with its Agent, and it is the Agent who is in control of the event. Likewise, in (5d), the subject of *promise* (i.e., *she*) is not the controller of PRO but is nonetheless in control of who gets to play.

In other words, one may conclude that the control relation specified by the meaning of *beg* and *promise*, respectively, does not directly concern the syntactic subject of the subordinate clause, but rather a semantic element in control of the subordinate event. Farkas (1988) introduces the feature RESP(onsibility) to account for this element, and Sag & Pollard (1991) assume an X-ARG feature for the same purpose. Given that the control relation primarily concerns a semantic element, determining the understood subject of the subordinate clause then becomes a matter of linking syntax and semantics. Usually, RESP/X-ARG associates with the subject, but in (5b) and (5d) it does not – precisely because the understood subject is not the element in control of the event.

Control shift is favored by passivization of the subordinate clause, as in (5b) – but it does not require passive per se, since a shift also occurs in (5d), which is at least formally active. Given the right circumstances, it may even occur with an active Agent as the understood subject, as illustrated in (6):

- (6) The pupil_i asked the teacher_j to PRO_{ij} leave early. (example from Farkas 1988)

Although *ask* is an object-oriented verb, usually assigning object control, the pragmatic circumstances enable a subject-control reading in (6), due to the well-known authority relations between pupil and teacher. Note, however, that even under a subject-control reading, the object (*the teacher*) is still *in* control of the event, being in a position to allow (or forbid) the pupil to leave early.

It should be noted that control shift is a fairly uncommon phenomenon in actual language use, but it is fairly widespread across languages. It is also theoretically relevant as a strong argument in favor of a semantic approach to controller assignment – at least regarding complement control.

2.2 Other kinds of complement control

Most accounts of complement control focus on objects. As for other complement types, the above reasoning applies to some but not all of them. First, it should be noted that English *wh*-infinitivals differ from ordinary object infinitives in that they often

receive arbitrary rather than obligatory control. One example of each type is given in (7) – examples from Barrie (2007: 263). There are also some few cases of arbitrary control in ordinary non-finite object clauses (cf. Section 4):

- (7) a. John_i knows when to PRO_i wash the dishes.
 b. Mary_i learned how to PRO_{arb} fly a 747.

Prepositional verb complements follow the general pattern for objects, i.e., subject control in single complement structures and object control in two-complement structures, as illustrated by the Swedish examples in (8):

- (8) a. Har_i du försökt med att PRO_i starta om datorn? (Sw.)
 have you tried with to PRO start again computer-DEF
 ‘Have you tried rebooting the computer?’
 b. Allmänt brukar jag_i avråda folk_j från att PRO_j köpa alltför
 generally use I advice-against people from to PRO buy too
 små bilar. (Sw.)
 small cars
 ‘I usually recommend people not to buy too small cars.’

Predicative complements (also called subject complements) behave entirely differently from other verb complements, and they are interpreted according to a pattern of indirect control (cf. Section 5.2). As for complements of nouns and adjectives, these are treated in Section 5.1.

3. Adjunct control

If obligatory control in object clauses has been dominating the theoretical control literature, adjunct control is a larger issue in traditional grammar – and especially in normative grammar. Usually, PRO in adverbial adjuncts and free modifiers is controlled by the matrix subject, as in (9):

- (9) a. After PRO_i finishing her studies, she_i decided to try out her luck overseas.
 b. You_i must apply to the embassy to PRO_i get a visa.
 c. PRO_i Just happy to get a job, he_i didn’t mind the low salary.

Exceptions to this pattern display what may be called *pragmatic control*, where – instead of the subject – PRO is controlled by some other pragmatically salient element in the context.⁴ This is illustrated in (10) (note that an ungrammaticality star on an index means that the indicated coreference relation is unavailable):

4. Other terms for what is called pragmatic control here include *logophoric control* (e.g., Williams 1992) and *control by sentence topic* (Kawasaki 1993).

- (10) a. After PRO_i finishing her studies, an overseas job_i was a welcome change.
 b. An application_i must be sent to the embassy to PRO_i get a visa.
 c. PRO_i Just happy to get a job, the salary_i was a lesser concern.

There is some disagreement regarding the acceptability of such sentences. Therefore, they make for a controversial topic in normative grammar and are sometimes discouraged by usage guides (under the label of *dangling* or *unattached modifiers*). It is clear, however, that pragmatic control is way too common and too widely accepted to be simply disregarded as ungrammatical. At most, it may be considered a fault of style. The acceptability issues regarding pragmatic control are not typical of English but also concern the Scandinavian languages and, to varying degrees, presumably all languages with similar constructions. I will not dwell further on the normative aspects of adjunct control here, but rather focus on the descriptive facts.

In a corpus study of Swedish, Lyngfelt (2002) distinguishes three properties that significantly favor pragmatic (non-subject) control in adverbial adjuncts. In fact (except for a couple of special types to be illustrated in (13) below), it is hard to come across cases of pragmatic control that do not exhibit at least one of these three characteristics:

- A. sentence-initial adjunct
 B. passive matrix clause
 C. expletive matrix subject

The relevance of sentence-initial position (A) has been stressed in a number of works and with respect to several languages. It is quite clear that pragmatic control is both more common and less restricted in sentence-initial adjuncts. In non-initial adjuncts, pragmatic control is relatively rare and typically restricted to cases where the matrix subject is ruled out as a controller for semantic reasons. For instance, subject control is unavailable in (10b) since an application cannot acquire a visa. In sentence-initial adjuncts, by contrast, pragmatic control seems to be pretty much freely available as long as it suits the context. An example where subject control would be semantically possible, but where pragmatic control is still the preferred interpretation, is given in (11):

- (11) After PRO_j finishing the dissertation, they_i couldn't blame her_j for taking a vacation.

Passivization (B) also favors pragmatic control, as again illustrated in (10b), where PRO is controlled by the Agent of *be sent* rather than the subject. In passive sentences, both the subject and the Agent are viable controllers; and control by the matrix Agent, as in (10b), is fairly common. Finally, expletive subjects (C) make poor controllers, which leaves the field open for pragmatic control, as in (12):

- (12) After PRO_{j/i} reading this book, it_i was hard for me_j to eat any type of meat for a while.

Common to passives and expletives is that they represent non-agentive subjects. This property is also common in other cases of pragmatic control, like (10a) and (10c). It is not, however, non-agentivity as such that is the decisive property but rather the low (pragmatic) saliency of these subjects. If the subject is pragmatically salient, we do get subject control.

As an additional observation, it should be noted that there are some cases of pragmatic control that are entirely uncontroversial from a normative perspective, for instance the two types exemplified in (13):

- (13) a. They_i sent me_j back to PRO_j get another one.
b. PRO Judging from experience, some students are bound to get this wrong.

As shown in (13a), it is perfectly acceptable for PRO in a sentence-final purpose clause to be controlled by the matrix object instead of the subject. As for speaker-oriented adverbials, as in (13b), pragmatic control (more specifically, control by the speaker) is the only interpretation. Even from a strict normative viewpoint, these cases must be regarded as exceptions to the subject control pattern rather than violations of it. More to the point, they are usually disregarded altogether – presumably precisely because they are uncontroversial.

Finally, with respect to the distinction between obligatory and non-obligatory control, the dominance of subject control has prompted a normative rule that PRO should be controlled by the matrix subject. Quirk et al. (1985: 1120) refer to this as the *attachment rule*. According to this rule, adjuncts are subject to obligatory subject control. However, the mere need for a normative rule shows that this pattern is not really obligatory. Taking the full range of data into account, it is quite clear that adjuncts fall outside the domain for obligatory control.

4. Arbitrary control

As mentioned above, arbitrary control may be characterized as non-control; there is no controller, and PRO receives an arbitrary or generic interpretation. This is the standard pattern in non-finite subject clauses (14a), including extraposed subjects (14b), as well as in so-called *tough* constructions (14c). It is also very common in independent non-finite clauses, typically used as headings (14d):

- (14) a. PRO_{arb} Getting a new passport takes about a week.
b. It's not easy to PRO_{arb} tell two laurel species apart.
c. This puzzle isn't that hard to PRO_{arb} solve.
d. PRO_{arb} Winning at poker

All these sentences are referring to activities without indicating who is performing them, which yields a generic interpretation of PRO. The statements in (14a–c) are presented

as valid for any arbitrary individual, whereas headings like (14d) simply indicate what kind of activity is being treated in the text in question. In none of these cases is there a controller of PRO, not even implicitly. Accordingly, structures of arbitrary control are best treated as generic expressions, where PRO is assigned direct arbitrary reference.

However, just like with other generic structures, there is a bias towards salient interpretations. There may often be a specific reading provided by the context, typically associated with the speaker. Both (14b) and (14c), for instance, report subjective judgments concerning the speaker and are not necessarily true for anyone else. There are also cases that refer more explicitly to specific situations. Consider, for example, the following sentences:

- (15) a. In this weather, it's really hard PRO_{arb} to get a fire going.
 b. It was no use PRO_{arb} complaining.
 c. Do you know where to PRO_{arb} get a decent lunch around here?

A sentence like (15a) typically refers to a specific event, where a referent corresponding to PRO is provided by the context – and (15b) definitely does. Still, both are instances of arbitrary control. This is because they are *presented* as general statements. Although the intended subjects of *get a fire going* and *complaining*, respectively, may be quite obvious for each utterance, the use of these constructions (instead of, e.g., *I couldn't get a fire going*) implies – correctly or not – that the same facts would hold for anyone in the same situation. Likewise, although a question like (15c) is typically asked with the speaker in mind, it is expressed as pertaining to anyone.

This is also why arbitrary control should be distinguished from pragmatic control (as described in the previous section), where there is no genericity involved. In both cases, the interpretation of PRO is determined by the context, but in the case of arbitrary control that is just a secondary effect. PRO is assigned arbitrary reference, and the contextual bias involved has more in common with other generic expressions than with other control structures. I emphasize this because from a viewpoint focusing on the distinction between obligatory and non-obligatory control, arbitrary control is easily seen as just a special case of non-obligatory control. When put more into focus, however, it is shown to be more distinct than that. Whereas pragmatic control is a form of control, arbitrary control is essentially non-control.

Having established this, it is important to note that typical arbitrary control structures can still be assigned specific reference. In English, this is done by including a *for* phrase, as in (16a). The interpretation may also be specified by a reflexive, as in (16b):

- (16) a. That's a difficult thing for me/a kid/anyone_i to PRO_i do.
 b. PRO Shaving myself/himself/oneself was not an option.

PRO in (16a) is obligatorily coreferential with the complement of *for*. This element may be a specific entity (e.g., *me*), a class (e.g., *kid*), or an open variable (e.g., *anyone*). In

the latter case, the *for* phrase may seem redundant, since the resulting reading is one of arbitrary reference; but it adds emphasis by making this explicit. When the non-finite clause contains a reflexive pronoun, as in (16b), the interpretation of this pronoun also determines the interpretation of PRO; and the arbitrary reading is maintained only in combination with a generic pronoun like *oneself*.

As mentioned above, arbitrary control typically appears in non-finite subject clauses, *tough* constructions, and independent non-finite structures. Of these, *tough* constructions may require some explanation. These involve gapped infinitives embedded in an adjective phrase, as in (17a), or a noun phrase, as in (17b). In the latter case, the infinitive is still associated with the adjective:

- (17) a. This nut_i is hard to PRO_{arb} crack []_i.
 b. This is a hard nut_i to PRO_{arb} crack []_i.
 c. It is hard to PRO_{arb} crack this nut.
 d. To PRO_{arb} crack this nut is hard.

A distinguishing feature of these constructions is the gap in the infinitive (the object of *crack*), which corresponds to the noun *nut*. It is also striking how they resemble subject infinitives, as in (17c–d); and they are indeed semantically equivalent to these. In transformational frameworks, *tough* constructions are assumed to be derived from subject clauses, and it seems quite clear that there is *some* kind of structural relation. In any case, the similarity explains why PRO in *tough* constructions is interpreted the same way as in non-finite subject clauses, i.e., by arbitrary control.

Other structures similar to *tough* constructions are interpreted in the same way. For example, Swedish employs what is probably best described as a *tough* verb, namely the ‘be possible’ sense of the verb *gå*, as in (18), where the interpretation of PRO is, as expected, arbitrary control:

- (18) Bilen går inte att PRO_{arb} laga.
car-DEF goes not to PRO_{arb} fix
 ‘The car isn’t possible to fix/It isn’t possible to fix the car.’

Finally, there are also some cases of arbitrary control in verb complements, which otherwise usually receive obligatory control (cf. Section 2). Such cases include prepositional complements of certain verbs, as in (19a), and English *wh*-infinitivals, as in (19b):

- (19) a. He has lectured on PRO_{arb} translating poetry at the university for several years.
 b. Who discovered how to PRO_{arb} milk a cow?

If *tough* constructions are similar to subject infinitives, then these constructions rather resemble headings (cf. Example (14d) above), especially the type in (19a), where *Translating poetry* might well be the title of a book or a lecture (*wh*-infinitivals sometimes

appear as independent utterances as well). Arbitrary control in verb complements is quite restricted and seems to be licensed by certain specific verbs.

The distribution of arbitrary control structures, which typically occur in argument positions, may be contrasted with that of pragmatic control, which only appears in adjuncts.

5. Less discussed control patterns

Although there is a huge literature on control, it has mainly focused on complement control (Section 2) and to some extent adjunct control (Section 3). There are, however, several other types of control structure. These types have been extensively discussed from a structural perspective, especially various kinds of infinitive, but the *control* literature rarely ventures beyond objects and adverbial adjuncts.

This section will account for control patterns in noun phrases and adjective phrases (5.1), indirect control (5.2), and some other control relations (5.3). Some of the generalizations are originally based on Swedish control patterns (cf. Lyngfelt 2002), although most examples will be in English. On the few occasions where the two languages are known to differ, this will be noted.

5.1 Control in noun phrases and adjective phrases

In adnominal non-finite clauses, i.e., non-finite clauses modifying nouns, most cases adhere to the same interpretive pattern: possessive control. This means that PRO is controlled by whoever is in possession, in a broad sense, of the matrix noun, as illustrated in (20):

- (20) a. They assigned me_i another essay to PRO_i write.
 b. She_i was just getting into the habit of PRO_i reading.
 c. There may be reasons to reconsider your_i promise to PRO_i retire.

Although the controllers are realized differently in all three sentences, as an object in (20a), a subject in (20b), and a genitive modifier in (20c), they all share the same possessive relation between PRO and the noun phrase containing it. In (20a), the controller is the person being assigned the essay. In (20b), the one who has got into a habit can be said to have acquired it. And in (20c), although the controller is the person who gave rather than received the promise, it is still his or her promise, as indicated by the genitive. As shown by these examples, the notion of possession involved includes more than just ownership; in many cases the relevant property is rather access to the element in question. As of yet, no precise semantic characterization of this possessive relation

has been proposed. Roughly, the possessor corresponds to a genitive modifier – and may well be realized as such, as in (20c).

The examples in (20) represent three different types of adnominal: an infinitival relative clause (20a), an identifying apposition (20b), and a complement (20c). Starting with the infinitival relatives (or relative infinitives), these normally contain a gap, which is coreferential with the matrix noun (as indicated by the j index in (21a) and (21c)). In addition to this general pattern, English also employs infinitival relatives without a gap, as in (21b). The controller in these structures is not the possessor of the matrix noun, but the noun itself. In Swedish, such structures are ungrammatical, and a sentence like (21b) would have to be construed with a finite relative clause.⁵ Even in English, the pattern of possessive control is obligatory if the infinitive includes a gap. The matrix noun corresponds to the gap and cannot at the same time be the controller of PRO, since PRO and the gap are referentially distinct arguments of the same predicate:

- (21) a. They assigned me_i another essay_j to PRO_i write []_j.
 b. You need someone_i to PRO_i help you.
 c. You_i need someone_j to PRO_i help []_j.

Identifying appositions (20b) are distinguished by the head and the modifier being coreferential. In (20b), the habit *is reading*. For this type, there is no alternative to the standard pattern of possessive control. As for the complement type (20c), it usually occurs with deverbal nouns. The control pattern is parallel to that of the corresponding verbs, where the possessor of the noun corresponds to the subject of the verb, as shown in (22). Nevertheless, these complements typically display possessive control:

- (22) a. He_i promised to PRO_i resign/his_i promise to PRO_i resign
 b. She_i intends to PRO_i win/her_i intention of PRO_i winning

Turning to control in adjective phrases, there are two control patterns, corresponding to two different structure types. These two types are often discussed with reference to the contrasting examples *easy to please* and *eager to please*. As mentioned in Section 4, *tough* constructions receive arbitrary control, as in (23a). In other adjective phrases, PRO is controlled by the *base of predication* of the adjective; whatever the adjective is predicated of is also the controller of PRO. This is illustrated in (23b–c):

- (23) a. John_i is easy to PRO_{arb} please []_i.
 b. John_i is eager to PRO_i please.
 c. That almost made me_i ready to PRO_i give up.

5. There are some exceptional cases of infinitival relative clauses without gaps in Swedish as well; and this usage, although still marginal, seems to be spreading. Most likely, this is due to influence from English.

As in infinitival relatives, the gap seems to be the crucial difference here. In *tough* constructions, the base of predication of the adjective corresponds to the gap; if there is no gap, the base of predication is the controller.

The patterns of possessive control in noun phrases and control by the base of predication in adjective phrases are structurally similar, in that the controller equals the external argument of the matrix head (a property they also share with subject control of verb complements and adjuncts). As a local control relation, it is quite consistent throughout both structure types. However, this local relation is often implicit, since arguments of nouns and adjectives are usually unexpressed. The actual interpretation of the possessor/base of predication, and consequently of PRO, depends on external factors that vary according to the context. The most common outcome is coreference with the matrix subject.

5.2 Indirect control

As mentioned in Section 2.2 above, predicative complements (or subject complements) behave differently from ordinary verb complements with respect to control. Instead of being directly related to an element in the matrix clause, PRO in predicative complements is controlled by a corresponding element *within* the subject of the matrix clause. This two-step relation (the controller is an argument of an argument), which is illustrated in (24), may be called indirect control:

- (24) a. PRO_{arb,i} Seeing is PRO_i believing.
 b. My_i original intention was to PRO_i write a mystery novel.

If the subject itself is a non-finite clause, as in (24a), PRO in the predicative corefers with PRO in the subject. If the subject is a noun phrase, PRO is controlled by the possessor of the noun (cf. Section 5.1), which in (24b) is realized as a genitive modifier. What these two controllers have in common is that they are the external arguments of their respective heads; subjects (including PRO) are the external arguments of verbs, and possessors/genitives are the external arguments of nouns. Thus, the external argument of the predicative (i.e., PRO) is controlled by the external argument of the subject.

This pattern of indirect control follows from the nature of predicative complements. Since copular verbs basically equate the predicative with the subject, it follows that predicative non-finite clauses co-occur with subjects with some sort of sentential content. Accordingly, both “events” have corresponding “subject” arguments. Even when the matrix subject is a noun phrase, it carries some kind of eventive meaning and is often headed by a deverbal noun. Notice, for instance, how the noun *intention* in (24b) corresponds to the verb *intend*, and how the genitive of the noun equals the subject of the verb (*my intention/I intended*).

As shown in Section 4, PRO in subjects is interpreted by arbitrary control. Hence, in sentences where both the subject and the predicative complement are non-finite clauses, as in (24a), the arbitrary interpretation extends to the predicative as well. However, the predicative does not receive an arbitrary reading by itself; PRO in the predicative is still obligatorily controlled by whatever is the external argument of the subject.

Another kind of indirect control seems to occur when a non-finite clause is embedded in another non-finite clause:

- (25) She_i asked me_j to PRO_j take care of the applications before PRO_j attending to anything else.

In (25), PRO in the embedded adverbial (*before attending*) is controlled by its matrix subject, which itself happens to be PRO (the understood subject of *take care*). This, in turn, is controlled by its matrix object (since *ask* is an object-oriented verb), and thus the deepest embedded PRO is indirectly controlled by the main-clause object. I would, however, rather treat this as two separate control relations. Unlike predicative complements, where indirect control is a core property, cases like (25) are simply a consequence of the recursiveness of language.

5.3 Some other control relations

Most syntactic control relations hold within the same finite clause. However, when the subject of a subordinate clause is itself a non-finite clause, PRO may in some circumstances be controlled by an element outside the immediately superordinate clause, as illustrated in (26). Since Grinder (1970), this phenomenon is called *super-equi*.⁶

- (26) a. John_i knew that PRO_i making a fool of himself in public disturbed Sue.
 b. *John_i knew that it disturbed Sue to PRO_i make a fool of himself in public.
 c. John_i knew that it would help Sue to PRO_i behave himself in public.

As illustrated in (26), the availability of super-equi depends both on position and on the predicate of the intermediate clause. For some predicates (like *disturb* in (26b)), super-equi is not available if the non-finite subject is extraposed, while for other predicates, like *help* in (26c), it works just fine. It may be worth noting that the structure in (26a) is ungrammatical in some other Germanic languages (e.g., Swedish, Icelandic, and German), where non-finite clauses are disallowed in the ordinary subject position

6. In early transformational grammar, control was treated as *equi-NP deletion*, on the assumption that the subject of a non-finite clause was deleted due to coreference with another element. Control across a finite clause boundary was consequently called super-equi. Although the analysis as such is no longer maintained, the name super-equi has stuck.

of subordinate clauses and hence are obligatorily extraposed (in Scandinavian, this restriction concerns finite clauses as well).

For some reason, the discussion about super-equi is usually focused on sentences where a reflexive pronoun specifies the intended meaning, and reflexives are known to specify or sometimes even overrule otherwise expected control patterns (cf. Example (16b) above). Without a reflexive, as in (27a), the interpretation is less fixed:

- (27) a. John knew that it would help Sue to PRO make a good impression.
 b. He learned that PRO_{arb} throwing a party didn't have to be such a big deal.

In (27a), PRO could be coreferential with either John or Sue, or maybe even someone else. Since the normal pattern for non-finite subjects in subordinate clauses is arbitrary control, as in (27b), just like in other subjects (cf. Section 4), super-equi might simply be a special case of arbitrary reference being specified by the context. On the other hand, the wealth of data and literature on super-equi suggests that it is more than that. Especially the fact that there are syntactic constraints involved indicates that this is not merely a pragmatic issue. In any case, although super-equi has been extensively discussed for decades, we still have not reached a proper understanding of it.

Finally, let us consider a couple of sentences where PRO and the controller do not match entirely. Usually, there is a one-to-one relation between PRO and its controller, but in some cases the controller only covers part of the reference of PRO, as in (28a); and in some cases PRO is jointly controlled by the subject and the object, as in (28b). In Landau (2000), these relations are called partial control and split control, respectively:

- (28) a. The chair_i preferred to PRO_{i+} gather at 6. (Landau 2000: 5)
 b. John_i asked Mary_j whether to PRO_{i+j} get themselves a new car. (Landau 2000: 53)

Some scholars also recognize implicit control as a category of its own, pertaining to cases when the controller is not expressed in the syntax, for instance control by an implicit agent in a passive clause (cf. Section 3). I have not done so here, since some control relations hold regardless of whether the controller is explicit or not, e.g., possessive control in adnominals (cf. Section 5.1). It may also be the case that the local control relation is implicit, although a coreferential element is expressed elsewhere in the syntax; again, a typical example is (local) possessive control in adnominals.

6. Outlook

Although there is a huge literature on control, most of it has centered around a fairly small subset of control structures. The main issues in theoretical syntax seem to be (a) the distinction between obligatory and non-obligatory control and (b) how to

account for the obligatory control patterns. In practice, this usually leads to a focus on control in verb complements, notably infinitival objects. There are admittedly good reasons for this. For syntactic theory, it is a highly relevant question what is determined by the syntax and what is not. And in attempting to explain that which falls within the domain of syntax, it is a high priority to account for core phenomena like the relation between verbs, subjects, and objects. It is also a matter of fact that this task is far from finished. For instance, control shift remains a particularly elusive phenomenon.

Nevertheless, it seems that the ripest field for future research on control would concern other control structures than the standard cases. The control patterns in noun phrases, adjective phrases, and predicative complements should fall within the realm of even the most narrow syntactic theory, but have been largely disregarded in the literature so far. As for more specific topics, *wh*-infinivals are among the phenomena that warrant more attention.

From a more semantic (or pragmatic) viewpoint, notions like arbitrary control, pragmatic control, and possessive control are still poorly understood. Arbitrary control is worth exploring both in relation to genericity in general and in relation to pragmatic control. For instance, just what is the difference between pragmatic control and the contextual bias involved in arbitrary interpretation? Also, to what extent is genericity involved when typical arbitrary control structures are assigned specific reference elsewhere in the syntax? As for pragmatic control, we know fairly well under which circumstances it may occur, but far too little of the pragmatic interpretation as such. Turning to possessive control, the semantics of this notion has yet to be made precise, a venture that would coincide with seeking a better understanding of the genitive.

Cross-linguistically, the control literature is dominated by a focus on English, but includes quite a lot of data on other languages as well. Some interesting observations include control into finite complements in Portuguese, control of objects in Chinese, and backwards control – where the explicit element resides in the subordinate clause and the implicit element in the matrix clause – in Romanian and Malagasy. Not all of these cases fit standard definitions of control. As a general remark on the cross-linguistic data, it is striking that, although the distribution of control structures varies greatly across languages, the interpretation of the control relations is remarkably similar. Whether this hints at universal interpretation strategies or merely depends on what data are available remains to be seen.

Acquisitional studies of control are few but not nonexistent, cf. for example Goodluck & Behne (1992). As for the diachronic aspects, it is hard to find studies of the development of control per se. Rather, control data may be extracted from diachronic studies of various kinds of control *structure*, such as infinitival clauses, gerunds, etc.

All in all, there is a great deal left to be learned about control.

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