

INFINITIVE CLAUSES

GENERAL PROPERTIES OF INFINITIVE COMPLEMENTS

1. General Remarks

Infinitive constructions represent a complex, diversified type of subordinate clauses, with a central position in the complement system of English. Unlike *that* complements, infinitive complements are non-finite, i.e., the infinitive lacks deictic tense and agreement features.

Origin. The infinitive was originally a verbal noun, which later acquired verbal properties. An infinitive verb like 'to write' descends from a verbal noun, whose Nominative / Accusative form was *writan*, and whose Dative was *to writenne* or *writanne*. The Dative thus consisted of a distinctive Dative form, *writenne*, etc. plus the preposition *to*, and was a prepositional object modifying the verb. The preposition *to* meant "toward" and pointed to the goal toward which the activity of the main verb was directed. "Jealousy drove him to do it", thus meant "drove him toward the doing of it". Similarly after adjectives: 'I am ready to do it, i.e., "ready in the direction of doing it". The original 'goal, directional' meaning of *to* is still clearly felt in the interpretation of the infinitive mood, and the prepositional origin of the mood marker still explains certain syntactic properties of the present-day English complement.

The Dative preposition *to* has turned into a tense/mood marker. The change in categorial status from a P⁰ to a T⁰ constituent, a functional category of the verb, apparently took place in Middle English (Curme, 1931:455, Fischer (1992), Tomoyuki (1997)). 'In ME the preposition *to* lost its lexical meaning of 'direction/ purpose', as is testified by the introduction of the *for-to* infinitives, *for* strengthening the goal meaning of the construction. At the same time, the Dative ending - *enne*, which confirmed the case-assigning prepositional status of *to* disappeared. Therefore, *to* lost its Dative Case-feature, and this allowed it to become a T element. Support for the categorial change from P to T comes from the emergence of perfect infinitives in Middle English.

- (1) ich ... schulde mid rihte beon more scheomful uorte hebben i speken, ase ich spec.
'I should rightly be more ashamed to have spoken as I spoke'

Given the assumption that perfect auxiliaries must be syntactically licensed by T, the sentence above indicates that *to* shifted its category from P to T in ME.

2. The classification of infinitive constructions relies on the way in which they express or fail to (overtly) express their subject. An expected consequence of the fact that the infinitive Inflection lacks regular agreement features is that it cannot assign Nominative case, and more generally, there is no subject case assigner inside the Infinitive IP. The four infinitive constructions available in modern English differ in terms of how they treat the subject, leaving it unexpressed or finding a case-assigner outside the IP domain. The following situations are attested:

a) The infinitive lacks an overt subject. This is probably the most frequent situation, since it is a characteristic property of non-finite complements that they are often subjectless (cf. Emonds (1985)).

- (2) a. They tried to arrive in time.
b. She promised her mother to study for the exam.
c. The company persuaded him to resign.

Even though no subject is overtly present, in each example, speakers always identify the subject without fail. In (2a) the understood subject necessarily is *they*, in (2b) the implicit subject is *she*, in (2c), it is the referent of *him*. Notice that this interpretation can be brought to light by finite paraphrases of the infinitive complement.

- (3) b'. She promised her mother that she would study
c' The company persuaded him that he should resign.

The implicit subject is understood to be coreferential with a nominal in the main clause. To represent this knowledge, an empty (= lacking phonological features) pronoun PRO is used to stand for the missing subject of the infinitive. The DP in the main clause with which PRO is co-referential is called the *controller* of PRO. Here are the relevant co-indexation patterns for the examples in (2) above:

- (4) a. They₁ tried [PRO₁ to arrive in time].
b. She₂ promised her mother [PRO₂ to study for the exam].
c. The company persuaded him₁ [PRO₁ to resign].

Control Theory, one of the UG modules in GB theory, is precisely a system of interpretative principles for the missing subject of infinitive and other non-finite constructions. (see below). The subjectless infinitive construction will be referred to as the PRO-TO construction or the *control construction*.

b) The second available structure is the *for-to* complement. In this case, the infinitive has a lexical subject different from the matrix subject and the infinitive is introduced by the complementizer *for*. The complementizer *for* serves as an assigner of Accusative case to the infinitive subject. The existence of a specific lexical complementizer indicates that at least in these cases infinitive complements are CPs.

- (5) a. I hope for him to win the presidential race.
a' I hope [_{CP} FOR [_{IP} him TO win the presidential race]]
b. They arranged for the woman to get the best medical treatment.
b'. They arranged [_{CP} FOR [_{IP} the woman TO get the best medical treatment]].

The *for-to* construction appears in the same environments as the PRO-*to*, moreover, the temporal-modal interpretation of *for-to* resembles that of the PRO-*to*. Both are often equivalent to subjunctive finite complements.

- (6) a. He decided [PRO to go]
a'. He decided that he should go.
b. They convinced them to pull down the old building.
b' They convinced them that they should pull down the old building.

Since the PRO-*to* construction is by far more frequent, the PRO-*to* and the *for-to* constructions are loosely referred to as the "control" constructions, even though this is a misnomer for *for-to*.

c) A third possibility is that the infinitive clause may have its expressed lexical subject, but this subject surfaces in the main clause either as the main clause subject (= the Nominative + Infinitive construction) or as the main clause object (= the Accusative + Infinitive construction). The comparison with corresponding finite *that* complements suggests that the infinitive subject has "raised" into the main clause, becoming a main clause constituent. In these constructions, the assigner of case for the infinitive subject is a main clause constituent: the main verb in the Acc + Inf construction, and, respectively, the main clause Inflection in the Nom + Inf construction:

- (7) *Melvin appears to speak fluent Japanese.* (Nominative + Infinitive)
It appears that *Melvin* speaks fluent Japanese.
- (8) They proved *him* irrefutably *to be the liar.* (Accusative + Infinitive)
They proved irrefutably that *he* was a liar.

These two constructions (i.e., the Nominative + Infinitive and the Accusative + Infinitive) are known as the *raising infinitive constructions*. They are selected by a limited number of R(aising)- triggers. Since the possibility of the construction depends on the lexical properties of the matrix predicate, these constructions are said to be *lexically governed*.

The modal / temporal properties of raising infinitive clauses also differ from those of control clauses. While (most) control constructions accept subjunctive paraphrases, (most) raising constructions take indicative paraphrases, as the examples above indicate.

3. On the functional structure of the infinitive clause

As already stressed, the infinitive is a non-finite; it *lacks agreement features*, so the infinitive clause never contains a Nominative subject. Moreover, since it cannot express deictic tense, the infinitive is seldom used in independent sentences, though this is not impossible. Here are examples of main clause infinitives (probably containing an implicit main verb, though):

- (9) a. Oh, to some day meet her!
b. After all that's happened, to have in the end been left by her!

Though it cannot express deictic tense, the infinitive clause may express a different time sphere from the main clause; this suggests the presence of a [+Tense] feature, and of a T head in the infinitive clause, so that infinitive clauses are *at least* TP / IP projections.

- (10) a. *Now* he claims to have lost his car keys *yesterday*.
b. *Yesterday*, he decided to sell the car (in a month).

Even if the infinitive clause may contain a [+Tense] feature under the T head, the absence of the specific [+Present] / [+Past] features makes *impossible the occurrence of modal verbs* in infinitive clauses, since modal verbs are defective; they come from the lexicon specified as [+Present] or [+Past] and must check these features.

Infinitive clauses retain aspectual distinctions, perfect, progressive, perfect progressive. The infinitive clause has all aspect related functional heads.

- (11) a. It was a triumph to have performed the play on fifty consecutive nights.

- b. He had expected her to be reading at the time.
- c. He had expected her to have been reading at the time.

The presence of aspectual auxiliaries confirms the existence of a T-chain in the infinitive clause. (cf. Gueron & Hoekstra (1995)), as well as the existence of a syntactic T position.

3.1. **The negation of the infinitive clause.** There are two positions of the negative adverb *not* with respect to the marker *to*:

- a) The regular position of *not* is before *to*.

- (12) a. You appear to me not to quite know what you are talking about.
- b. To be or not to be, that is the question.

b) There is a second, non-standard, place for negation, a "split" infinitive position, where *not* appears between *to* and the verb.

- (13) a. There can be nothing to not / never talk about between us.
- b. I shall pledge myself to not inform on them.

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An important empirical fact is the absence of the negative clitic *n't* in infinitive clauses. In the analysis adopted for finite English sentences, the negative clitic is incorporated in the finite auxiliaries, *haven't*, *isn't*, *doesn't*, *shouldn't*, etc., which check their strong feature against the AgrS⁰ head. The absence of *n't* correlates with the absence of Agr features. The functional structure assumed for the upper English clause, namely AgrSP > NegP > TP ... correctly predicts the standard word order in negative infinitive clauses in (12). Since the infinitive Inflection lacks agreement features, finite auxiliaries as well as the negative clitic which depended on them will be missing, too. At the same time, since finite auxiliaries which check Agr features are not projected, Tense and AgrS form a syncretic projection, unless there is evidence to the contrary.

The lower position of negation illustrated in (13) is the result of adjoining *not* to a lower projection, a phenomenon which we have noticed in finite clauses as well.

- (14) You can't not sign the treaty now.

Apparently, *not* is adjoined to the VP in examples like (13). Evidence for this claim comes from VP ellipsis. VP ellipsis must erase all lexical VP constituents, leaving behind only functional constituents. The elided sequence should not include any functional constituent.

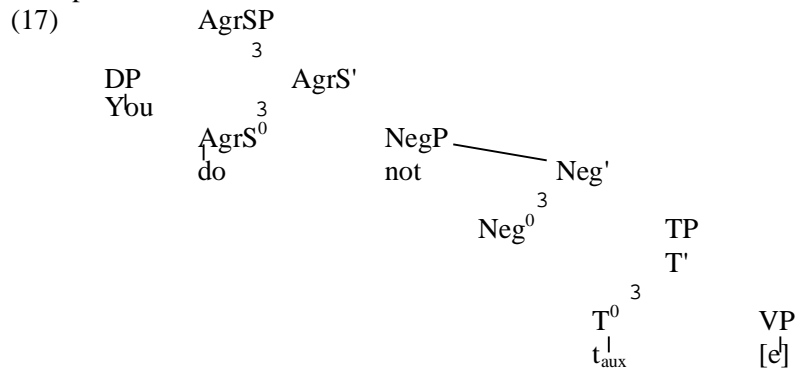
- (15) a. I can't do as much as I'd like [PRO to [e]_{VP}]
- b. I like Ted, but you do not [e]_{VP}

Consider (15b). In the analysis adopted here, in (15b), *do* is in Agr S⁰, while *not* is in Spec NegP, as shown in (17). This allows VP Deletion to operate, erasing all lexical constituents. Consider in contrast, the data below, provided by Beukema and den Dikken (1989):

- (16) a. He does not gamble, because people expect [a parson [[_{NegP} not [_{TP} to [_{VPe}]]]]]
- b. *He does not gamble because people expect [a parson[_{TP} to[_{NegP} not[_{VPe}]]]]

In the grammatical example (16a), *not* is in Spec NegP, while *to* is in T⁰, at the lower edge of the functional area; the ungrammatical example (16b) interestingly contrasts with the

grammatical (15b). In the finite clause, the finite auxiliary *do* is in AgrS, with *not* in SpecNegP. In the ungrammatical example, *to* is in T⁰, while *not* is lower, adjoined to the VP, a lexical constituent. This is why VP deletion cannot leave *not* behind, in contrast with the finite clause example.



The presence of auxiliaries and of clausal negation is the surest sign of the presence of a syntactic position of Tense. Infinitive clauses always contain a TP and may contain Aspect Phrases as well.

3.2. *The position of Auxiliary adverbs in infinitive clauses.* English has a well-known class of 'auxiliary adverbs' (*ever, already, always, still, just, merely, utterly*, etc). In finite clauses these adverbs appear adjoined to the main verb, or to any functional projection of the verb.

- (18)
- a. John already has been reading for an hour. (TP adjunction)
 - b. John has already been reading for an hour. (AspP adjunction)
 - c. John has already read this novel. (VP adjunction)

Expectedly, their distribution is similar in infinitive clauses. In clauses that lack auxiliary verbs, the adverbs either precede or follow the T/M marker *to*. When the adverb appears between *to* and the verb, the structure is known as the "split infinitive".

- (19)
- Unsplit infinitive**
 - a. The girl seemed [_{T/MP} always [_{T/MP} to be in half mourning]].
 - Split Infinitive**
 - b. I undertook to partially fill up the office of parish clerk.
 - c. The tendency of the study of science is to utterly uproot such notions.
 - d. Ask Lucas to kindly make me a sandwich.
 - e. They want to nobly stem tyrannic pride.

The same distribution obtains in sentences with auxiliary verbs. The adverb adjoins to TP, to any AspP or AuxP or to the VP.

- (20)
- a. The former I do not remember [ever [_{T/MP} to have seen]].
 - b. She seems always to have been happy.
 - c. ?The former I don't remember to ever have seen. (split infinitive)
 - d. Life's aim is simply to be always looking for temptations.
 - e. She seems to have always been admired.

Remark. The split infinitive has been frowned upon by grammarians claiming that *to*, a former preposition, should not be separated from the infinitive, a former verbal noun. Curme (1931:461) makes the following comment regarding the split infinitive: "Since the fourteenth century, when it appeared, however, the split infinitive has been gradually gaining ground, in

recent times even making headway against deeply rooted prejudice, so that it frequently appears in good authors, among them many of our best, sometimes only occasionally, sometimes more freely. But it is never used with such consistency that it is uniformly employed where it should be." Notice that the split infinitive may have a disambiguating function. In examples (21a) below, the adverb *entirely* may refer to either verb, but this is not the case in the split infinitive (21b) example.

- (21) a. He failed *entirely* to comprehend it.
b. He failed to *entirely* comprehend it.

An indication of the strengthening of the split infinitive is the possibility to insert more than one adverb after *to*, as well as the possibility of inserting a more complex phrase or a parenthetical expression. The examples below are due to Jespersen and Curme.

- (22) a. Advise him to always carefully count his small change.
b. New emissaries are training with new tactics, to, if possible, entrap him and hoodwink and handcuff him.
c. His fortune being jeopardized, he hoped to more than retrieve it by going into speculation.

4. The syntax of *for-to* complements. The categorial status of infinitive clauses

The syntax of the *for-to* complex is not devoid of problems. The main issues to discuss are the following: 1) the status of *for* and, therefore, the categorial status of the *for-to* complement; 2) case-checking of the subject; 3) the semantics of *for-to* complements.

4.1. **The status of *for*.** In Modern English, *for* is *prepositional complementizer*. The manner in which *for* has been re-interpreted from a preposition into a complementizer is well studied in English.

The change occurred in Middle English, the time when infinitive clauses replaced finite subordinate ones at a fast rate. Middle English is also the time when the infinitive develops possibilities of expressing its own subject. The *for-to* construction is one of them. Fischer e. a. (2000), propose that infinitive constructions with a lexical subject all represent a by-product of the change from the OV to the VO order, a change which led to the adjacency of elements which used to appear at a distance. This allowed children to re-analyze the sentences to which they were exposed. The rise of the *for-to* construction best illustrates the role of the OV to VO word-order change. The basic idea is that a reanalysis took place in the (*for*) *NP to VP* construction, in such a way that *for* came to be analyzed as a complementizer rather than a preposition. Support for the claim that this change is an effect of the OV to VO change is that German and Dutch which, unlike English remained OV languages, did not undergo any reanalysis of this type. Thus, consider the following sentence type, which is acceptable in English and German/Dutch.

- (23) a. It is bad for you to smoke.
b. Es ist ungesund für dich zu rauchen.

Here the *for*-DP functions as a benefactive Indirect Object, assigned its θ - role by the matrix predicate *bad / ungesund*. Sentences like (24) occur only in English, not in German:

- (24) a. It is intolerable for John to get away with this.
 b. *Es is inakzeptable für Johann ungeschoren davon zu kommen.

Here the *for*-phrase cannot be interpreted as a benefactive IO, but is, instead, a subject. Thus English and German are alike when the main predicate licenses an IO, but only English allows the *for*-phrase θ -marked by the subordinate predicate as its subject. Thus the *for DP* in English still allows both the benefactive reading and the complementizer + subject reading. The two may even appear together as in (25a).

- (25) a. It is bad for the baby for you to smoke in his room.
 b. It is bad for you [PRO to smoke]
 c. It is bad [for you to smoke]

Historically, sentences like (25a) were at some point re-analyzed from a benefactive construction (followed by a PRO-to complement) as in (25b) into a (for) NP to VP infinitive clause as in (25c). Schematically the change is as in (26) below:

- (26) a. DP V (for)DP [_{CP} [_{IP} PRO to VP]]
 (benefactive construction, traditionally called 'organic for')
 b. DP V [_{CP} (for) [_{IP} DP to V]]
 (subject construction or 'inorganic for')

In Old English the Benefactive phrase has Dative case and the preposition *for* is not used yet. Notice the position of the Dative DP, either after the main verb as in (27a) or before the main verb, at a distance from the infinitive, so that reanalysis is impossible (27b):

- (27) a. [es traht is longsum eow [DAT] to gehyrenne.
 this tract is long for-you to hear
 'this treatise is tedious for you to listen to (2000: 216)
 b. nis me [DAT] earfethe to ge[olianne] [eodness willan
 not-is me difficult to suffer lord's will
 'It is not hard for me to endure the lord's will.

This structure continues to appear in Mid E, with the preposition *for* often replacing the Dative marking. The construction with or without *for* will begin to be used like the modern *for-to*, occurring as a whole in preverbal subject position, in examples where the Dative/*for*-DP cannot be interpreted as the object of the main predicate any longer. Thus, in the examples below it is clear that the (prepositionless) Dative has been reanalysed as the subject of the infinitival clause, with the C⁰ position being empty:

- (28) But a man to lyve pesibly with harde & overthwarte men is a gret & a commendable and manly dede.
 'But for a man to live peacefully with hard and hostile man is an act of grace and a commendable and manly deed'.

This example is a pattern which is present in Modern English, unlike German and Dutch:

- (29) For you to smoke is bad.

*Für dich zu rauchen ist ungesund.

Reanalysis was helped by the loss of Dative inflections and by the word order changes. In Old English the Dative of the main verbs could appear both before and after the main verb, while the infinitive object preceded the verb; the result was that the Dative / *for* phrase was not adjacent to the verb. In Middle English the VO order becomes the norm. The old benefactive phrase came to be always positioned next to the infinitive. Through this fixed adjacent position and the loss of Dative marking, an interpretation becomes available in which the older benefactive is the subject of the infinitive.

Present day status of For: As already said, given its obligatory position to the left of the subject, *for* is best analyzed as a prepositional complementizer.

The role it serves is that of case – licensing the subject. As is probably clear, this is a standard example of structural case checking. The infinitive subject is θ -marked by the infinitive verb, but it is case-checked by *for*. The fact that even prepositions, which typically assign inherent case, may assign structural case in English is support for the claim in van Kemenade (1987), that the history of English shows movement from a language with inherent case to a language where all case is structural.

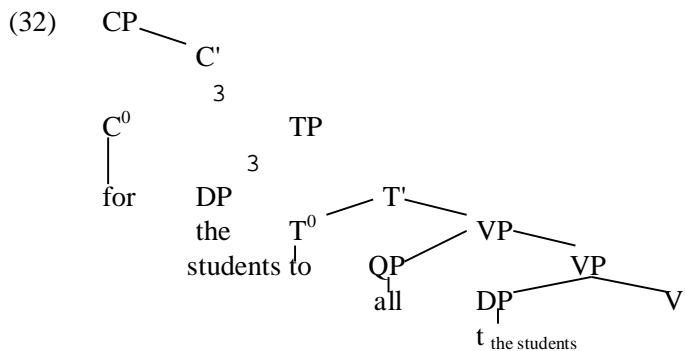
Conclusions

1. *For* is a prepositional complementizer in Modern English
2. *For-to* complements are categorially CPs.

4.2. *The structure of the for-to clause*. Consider the following examples:

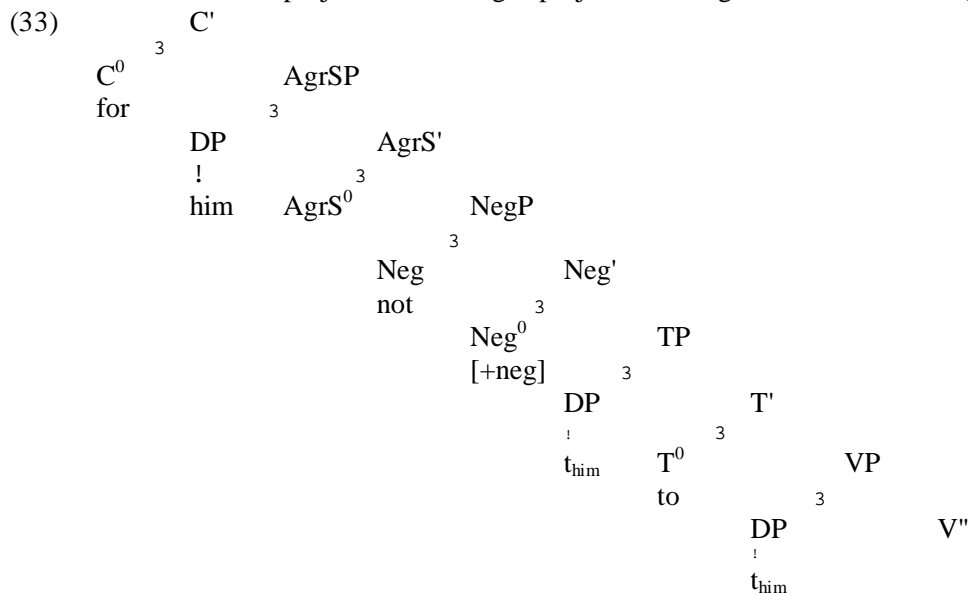
- (30) For him to do it on his own would be impossible.
 For the students *all to accept* this would be an error.
- (31) For him to have done that on his own is impossible.
 For him not to accept the truth would be an error.

Let us examine affirmative infinitives first, as in (30). In affirmative clauses, Tense/Mood and AgrS represent the same T projection. Assume that case is checked by *Agree*. The subject DP moves out of the SpecVP position to the specifier immediately under *for*, since nothing can intervene between *for* and the subject. We will take *for* to be the probe of the *Agree* operation, having an uninterpretable Accusative feature. This feature is checked by the subject DP, which sits in SpecT.



Evidence that the subject moves out of SpecVP comes from the distribution of floating quantifiers like *all*, *both*, *each*. Floating quantifiers appear only in front of syntactic predicates, i.e., predicative constituents which are c-commanded by a subject (cf. Baltin (1994)). If the QP is adjoined to the VP, and the subject has raised out of the VP, then the subject is in a position of c-command with respect to the VP, and the QP indeed precedes a syntactic predicate. Thus, the floating quantifier *all* is licensed in (30b), since the subject has surely moved out of the VP

Consider the negative infinitive clauses now (examples (31)). Apparently, at least in negative clauses, the subject sits in Spec AgrS, above *not*, a position where it is accessible to C⁰ *for*, which checks its case by Agree. The subject should be the closest Spec, or else Agree is blocked. This forces the projection of an AgrS projection in negative clauses, as in (33).



4.3. *The Semantics of the for-to construction.* Regarding the distribution of *for-to* constructions, two positions have been expressed in the literature. On the first view, to stress the sometimes unpredictable occurrence of a *for-to* complement, Pesetsky (1994), Bosković (1997) propose that *for-C*⁰ is l(exically)-selected. L-selection involves arbitrary selection of some predicate for lexical items and features associated with them and it cannot be reduced to either s-selection or c-selection. The fact that the noun *love* allows either *for* or *of*, whereas *desire* requires *for* is a matter of lexical selection. In that view, certain verbs, adjectives, nouns will be listed in the lexicon as being compatible with the particular prepositional C⁰ *for*, and we do not expect any semantic regularities in the distribution of *for*.

On the second view, C⁰ *for* appears with a particular class of verbs, with which it is semantically compatible. A general property of these predicates is that they are [+Emotive] or [+Evaluative], as first stated by Kiparsky and Kiparsky (1970). Bresnan (1972) argues that the complementizer *for* is semantically active. It expresses subjective reason or cause, purpose, or goal. Given Bresnan's proposal, one could let *for* freely appear in any infinitival complement, as long as its meaning is compatible with the semantics of the higher predicate. It is this second position that appears to have more empirical support.

In later work, Pesetsky (2000) also argues that whether or not an infinitival complement can be introduced by *for* is determined by the semantics of the higher predicate, in fact, of the whole higher clause. *For-to* complements have a particular interpretation. On the one hand, he claims, *for-to* complements are understood as if they contained an irrealis modal verb; this is why they are felicitous in the company of irrealis subjunctive main clauses, an observation which has often been made (cf. (34a, c)). On the other hand, they may receive a generic interpretation, again in harmony

with a generic matrix (cf. (34b, d)). A generic interpretation shares with an irrealis subjunctive one the fact that both are intensional constructions, judged to be true in ideal settings. Predicates that are compatible with *for* either select unrealized states of affairs as complements (the case of emotive verbs) or else are themselves used generically.

(34) ***Irrealis / generic infinitive clauses.***

- a. I would like (very much) for Sue to buy this book. [irrealis]
- b. I always prefer for my students to buy their own books [generic matrix]
- c. Bill would hate (it) for Mary to learn about her misfortune. [irrealis]
- d. Bill hates (it) for people to learn about their misfortunes. [generic matrix]

For-to is excluded with realis complements, where the matrix has an episodic past reading and the main verb is factive or implicative:

- (35) # FOR non-generic matrix factive/implicative complement.
#Bill hated (it) for Mary to know French.

As with *that* complements, it has been argued by Pesetsky that the complementizer *for* lexicalizes an uninterpretable Tense feature in C^0 . The fact that *for* is a mark of tense, and that *for-to* complements have a T feature explains why, with the appropriate types of verbs *for-to* may appear in subject position, in SpecT.

- (36) a. For him not to confess the truth would be at once idle and perilous.

It will be seen further below that untensed infinitives cannot appear in subject position, i.e. in SpecT.

5. Licensing PRO

5.1. ***The GB account.*** Like any empty category, PRO must be licensed, i.e. its presence must follow from some general principle of the grammar, and PRO must be identified (cf. Rizzi (1986)). Control Theory is precisely a set of interpretative principles regarding the identification of PRO.

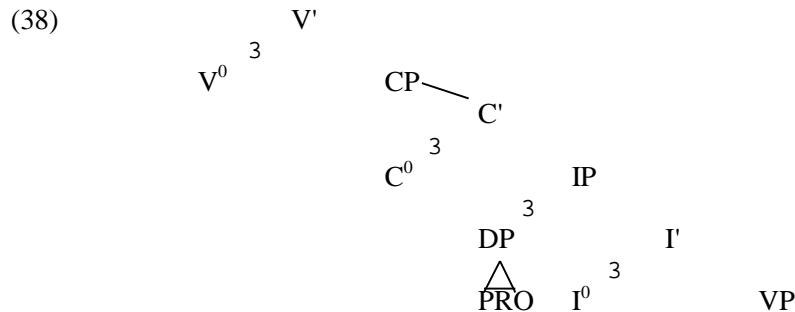
As to licensing, the most intuitive argument for postulating PRO comes from θ -Theory. PRO is the bearer of the θ -role assigned by the predicate to its external argument. Thus, since *sleep* cannot have modified its **a**-structure from one example to the next in (37), PRO is required as the bearer of the subject role assigned by *sleep* to its external argument:

- (37) a. John sleeps in the afternoon.
b. John always wants to sleep in the afternoon.

The presence of PRO in syntactic representations then follows from θ -theoretic principles. Other, more narrowly semantic, reasons for PRO will also be provided below.

Since (in English) the position occupied by PRO is normally not available for a lexical DP, a natural assumption was that PRO was syntactically different from lexical DPs, in addition to lacking phonological features. The classical GB account has it that PRO is caseless. This was because, as already explained, the infinitive inflection lacks agreement features and consequently cannot assign case to its subject. Moreover, the argument ran that PRO occupied a(n) ungoverned position where Case could not be assigned by any lexical or functional head external to the infinitival clause, since Case was assigned under government. The familiar

configuration below is precisely one in which government of PRO by the main verb is prevented by the CP barrier, so that PRO is ungoverned and caseless. The fact that PRO had to be ungoverned was the main motivation for assuming that PRO-TO constructions were CPs.



This account leads to certain complications of the theory. For instance, according to the Visibility Principle, a DP is visible for θ -marking at LF, only if it is case-marked. But PRO was not case-marked, yet it should be visible for θ -marking, since PRO certainly has a θ -role distinct from that of its controller.

(39) It displeased me_{1 Experiencer} [PRO_{1 Agent} to study for that exam].

A theory in which PRO would be less exceptional is thus to be desired.

5.2. **A more recent account. PRO has null case.** To simplify the theory, Chomsky & Lasnik (1993) propose that like any DP, PRO needs Case in order to be visible and interpretable at LF. They assume that non-finite Tense can check only *null* Case, so PRO is assigned *null* Case. Being a "minimal" pronoun, PRO is the only formative compatible with this type of case, which is not accepted by lexical DPs. Expectedly, PRO is excluded from regular case-marked positions, since it is incompatible with other types of case. Therefore, PRO and lexical DPs are (nearly always) in complementary distribution, as in (40).

- (40) a. Romario tried to [PRO to score the winning goal].
 b. *Romario tried [Bebeto to score the winning goal]

This proposal, though arbitrary and stipulative at first sight, has a number of desirable theoretical consequences and a measure of empirical support. Given minimalist options, null case could, in principle, be checked by Merge, by Agree or by Move. Merge, the direct combination of a verb with a DP, may be the right option of case-checking for DPs that occupy subcategorized positions. Since PRO is typically a subject, therefore a non-subcategorized DP, Merge is not the best option for case-checking PRO. If Agree or Move were involved, then SpecT, the head that checks case, must possess some sort of uninterpretable agreement features, activating the subject DP. Following Borer (1986), we will assume that non-finite Inflection possesses *anaphoric agreement features*.

Borer's insight is that an empty subject is always identified by Inflection/Agreement. Working in a GB frame, Borer attempts to reduce control to Binding Conditions and argues that Agr, which is a nominal constituent, may be either *anaphoric* or *non-anaphoric*. Agr features are not anaphoric in examples like the Romanian, *Doarme* (He is sleeping), where the Agr features may identify the implicit subject without any nominal antecedent. Agr features are anaphoric (syntactic anaphors) in control constructions. *Anaphoric agreement may not serve as an identifier for a coindexed subject, unless it is itself coindexed with some antecedent (the controller) that may transmit its features*. Landau (1999) retains the view that the infinitive inflection in control

constructions contains anaphoric agreement features, and builds on it an account of Control to be presented below.

Turning to the manner of case licensing PRO, we will assume that ability to check case is related to the presence in infinitival clauses of *anaphoric agreement*. Anaphoric agreement features must first be verified by some external source, and are then "transmitted" to the PRO subject. The hypothesis is that in contexts where PRO is licensed, the infinitival Inflection is endowed with anaphoric agreement features. If in addition to anaphoric agreement features, the T head also had the EPP property, case would be checked by movement of PRO from the SpecVP position, where it is θ -marked, to SpecT, where case is checked, together with the EPP feature of T. If T has agreement features, but not the EPP property, then case will be checked by Agree. The choice between these alternatives (Move or Agree) is an empirical matter. As it happens, there is empirical evidence in favour of Agree, rather than Move, as well as evidence which shows that the control /raising divide coincides with the presence /absence of anaphoric agreement. It is anaphoric agreement which licenses PRO, and ultimately secures the co-indexation of PRO with its controller. Anaphoric agreement can license only PRO.

The presence of agreement features in control, unlike raising, constructions, is proved by certain ellipsis phenomena, discussed in Lobeck (1990). Assuming Fukui and Speas' (1986) taxonomy of functional categories, summarized below, Lobeck (1990) argues that only a constituent that is the complement of an agreement inducing functional head may be deleted.

(41)	Functional Categories:	
	Agreement - inducing	Non - agreement - inducing
I (=T)	I [+tense]	(raising) to
D	's	a(n), the
C	[+wh] Comp	that, whether, if

Thus the examples with agreement inducing heads are grammatical (sentences a), whereas those with non-agreement-inducing heads are ungrammatical (sentences b).

- (42) a. We want to invite someone, but we don't know [_{CP} who [_C[_C+wh] [_{IP} e]]]
 b. *We thought Sue wanted to be invited, but we weren't sure [_C[_C whether/if] [[_{IP} e]]]
- (43) a. Lincoln's portrait didn't please me as much as [_{DP} Wilson [_D 's] [_{NP} e]]
 b. *I read about that person, and now, I want to see [_D[_D the] [_{NP} e]]

On the basis of such facts, Martin (1996) proposes that *to* in Control infinitives agrees with PRO in its specifier position, which explains why deletion of the VP is possible in control constructions, in contrast with raising ones. The infinitive marker *to* behaves differently in raising constructions, where VP deletion is no longer possible. This suggests that raising *to* is not an agreeing head. Notice again the difference between control (45) and raising infinitives (44) below:

- (44) a. ?*Mary claims not to like baseball, but she appears to [_{VP} e].
 b. *John considers Mary to be clever, and Mike considers Sally to [_{VP} e].
- (45) a. John wasn't sure he'd win the race, but he tried [PRO to [_{VP} e]]
 b. John convinced Bill to come to the party, and Sarah convinced Mary [PRO to [_{VP} e]]

The lack of agreement properties in raising infinitives also explains why Case cannot be assigned to the subject inside the infinitive clause in the Raising construction. As a result, the case of the subject in raising infinitives is checked by some head (the V or T) of the main clause. We retain that the Raising / Control divide coincides with the absence / presence of anaphoric agreement features.

While the deletion data suggests that the control Inf T⁰ is endowed with anaphoric agreement, nothing in what we have said so far would force PRO to move from its θ -position SpecVP to SpecT, the tentative case position.

Baltin (1994), Boskovič (1997) argue that, though the infinitive subject may move out of Spec VP for other reasons, the EPP feature of T⁰ is weak and does not have to be checked by overt movement of a DP to SpecT. Baltin (1994) makes the stronger claims that the PRO subject of control constructions *must* stay in VP. His argument, which we sketch briefly, is based on the distribution of floating quantifiers like *all*, *both*, *each*. In finite clauses, floating quantifiers may precede the modal verbs in Tense as in (46a), as well as other auxiliary verbs and the VP, as in (46b, c).

- (46) a. The children *all* would have been doing that.
b. The children would *all* have been doing that.
c. The children would have *all* been doing that.

In infinitives, floating quantifiers cannot precede the tense/modal marker *to* in the PRO-*to* complement (see (47)):

- (47) a. *All to do that would be inconvenient.
b. *Both not to show up for the party was rude of them.
(48) a. To all have been doing that would have been inconvenient.
b. To have all been doing that would have been inconvenient.

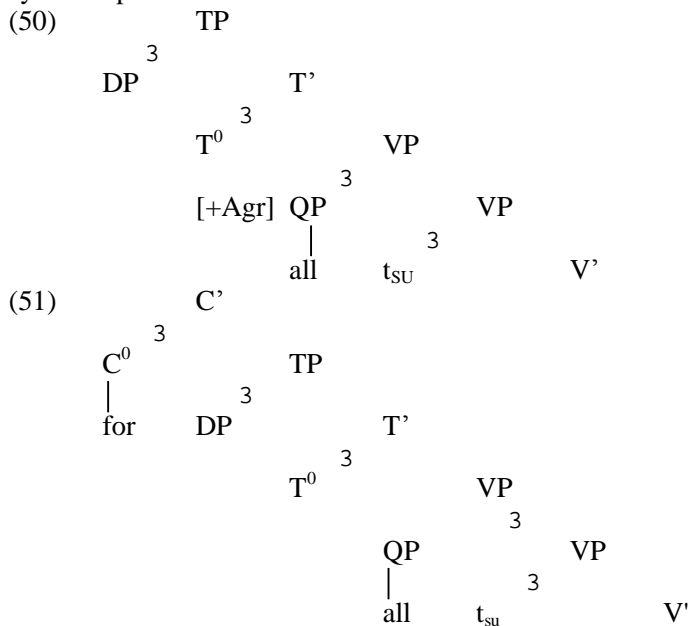
This restriction is likely to relate to the PRO subject since it would be inaccurate to prohibit floating quantifiers from preceding *to*, given that they can occur before *to* when the subject of the infinitive is lexical (cf. Baltin (1994:210)).

- (49) a. I believe these people [t *all* to [t have left]].
b. They seemed [t *all* to [t be friendly to us]].
c. For these people *all* to [t leave would be inconvenient].

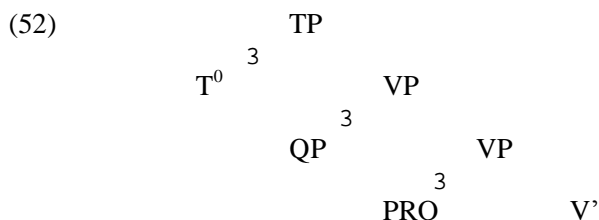
Floating quantifiers thus precede *to* in raising constructions and in the *for-to* construction. Raising constructions surely presuppose the raising of the subject out of the VP to some case position. The fact that floating quantifiers may precede *to* in the *for-to* structure may be taken as evidence that there too, the subject raises out of SpecVP, as assumed in the analysis presented above.

Floating Quantifiers have been described as *pre-predicate* constituents (see Pollock (1989), Baltin (1994) and for a different view, Sportiche (1988)). They must be adjoined to *syntactic predicates*. The notion of syntactic predicate is discussed in Rothstein (1983). Predication is held to be a primitive syntactic relation irreducible to θ -theory. Syntactic predicates can comprise three distinct types of expressions: a) those expressions that require a subject that is an argument; this is closest to the common-sense view of predicates (e.g. *John laughed*, *Mary relies on him*); b) expressions which are semantically complete, but syntactically unsaturated, so that they require an expletive subject argument; this is the notion of syntactic predicate discussed in connection with Extraposition and *It* Insertion. (e.g., *It appears that he abandoned her*); c) those specific syntactic constructions which are interpreted as predicates by virtue of their syntactic position: specifically, a syntactic predicate must be c-commanded by a DP subject. It is this last notion which is relevant for understanding the distribution of PRO, as well as that of floating quantifiers.

Therefore, a *syntactic predicate* is an (un)saturated constituent which has a c-commanding subject. Floating quantifiers are supposed to precede syntactic predicates. This condition is met in the finite clause (46), as well as in the infinitives in (49), but it is apparently not met in the ungrammatical (47). The relevant difference, according to Baltin, is that in the grammatical cases (46a), (49), the lexical subject is forced to move out of the VP, in order to check Case. Thus, in the finite clause, the subject moves to SpecT. Also in the *for-to* example, the subject is forced to reach SpecT/Spec AgrS, a position in which it can be assigned case by *for* (cf. (51)). The DP in SpecT/SpecAgrS is thus a c-commanding subject for the VP, defining a syntactic predicate.



In contrast, this condition is not met in (47); according to Baltin, a natural supposition is that, *PRO does not move* out of the VP position in overt syntax. As long as *PRO* remains inside the VP, there will be no c-commanding subject, and no syntactic predicate. Prepredicates cannot appear in front of the VP, in configurations like (52). Baltin's analysis is not devoid of serious problems; in particular it is not clear why the floating quantifier may precede the auxiliary verbs in the infinitives in (48) above. However, an important tentative result may be accepted: the infinitive Inflection cannot be claimed to have a (strong) EPP feature (cf. also Boskovic (1997)), and does not *require* movement of the subject to Spec I/ Spec T.

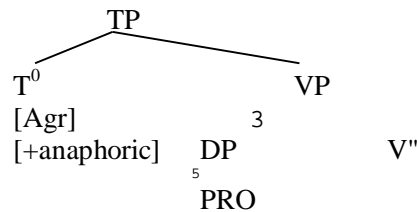


Thus *PRO* may remain in its VP position. Actually, Baltin more radically interpreted his data as an indication that, contra Chomsky & Lasnik (1993), *PRO* is not case-marked. This conclusion is too strong, since it would permit the presence of *PRO* in any position: say as an object in passive or in transitive sentences, contrary to fact.

(53) There was read PRO_{arb.}

Such examples were previously eliminated by prohibiting PRO from appearing in governed positions, but with the demise of government, nothing would force PRO to move out of this position. The supposition that PRO needs case would force PRO to move to a case-position. We will assume that SpecVP may be a case position for PRO and that the null Case of PRO is checked by Agree. The anaphoric agreement features of the infinitive Inflection serve as a probe, the goal is PRO. Null case is, or at least, may be checked in situ.

(54)



Conclusions

1. PRO is licensed by θ - theory
2. PRO is identified by Control Theory
3. PRO has null Case checked by Agree, in situ.
4. The infinitive Inflection is endowed with anaphoric agreement features in Control constructions.

6. On the modal temporal properties of the infinitive

We have established that infinitive clauses contain a Tense/ Moods syntactic position. In this paragraph we will examine the content of this position.

The infinitive mood will be discussed in the same semantic framework as the indicative and the subjunctive, starting from the assumption that grammatical moods are means of expressing modality. As before, we assume that any discourse unfolds against a set of propositions accepted as true by the discourse participants, which constitute the *common ground* of the discourse. Propositions are evaluated as true/ false, and reasoning unfolds taking into account the common ground as an idealized whole, or by specifying what propositions are specifically considered as premises in particular discursive situations.

Two semantic parameters have been shown to be essential in interpreting, modality: *the modal base* and *the ordering source* (cf. Kratzer (1981), (1991)). The modal base specifies the world(s) in which the proposition in the scope of the modal operator is evaluated.

Generally, the modal base, i.e., the set of alternative situations (or possible worlds) to the real context world, where the truth of the infinitive complement is evaluated is largely determined by the meaning of the main verb. For instance, the verb *believe* introduces doxastic alternatives to the context, *know* introduces epistemic alternatives, *want* introduces buletic or desiderative alternatives, etc:

- (55) John believes Paul to be honest.
John would like for Paul to be rich.

Thus, in John's belief worlds, Paul is honest; in worlds in which John's desires come true, Paul is rich. Naturally, what is believed, known, desirable, etc. in a situation (i.e., the modal

base) depends to a large extent on what is true in that situation, i.e., on what constitutes the common ground. For instance what is known (epistemic alternatives) in a context is a subpart of what is true. Similarly, what is true in a situation (i.e., the common ground) imposes constraints on what is believed in that situation. In contrast, what is wished for in a situation is much less constrained by what is true in that context. *A modal base is thus usually a subset of the conversational background*, and it represents one semantic parameter in the interpretation of modality and mood.

Ordering sources represent the second semantic parameter in the interpretation of mood and modality. Ordering sources are also sets of propositions, describing norms, ideals of action and behaviour. The conceivable alternatives in a modal base are *ordered* function of how well they realize the norms and ideals which represent the *ordering source*. Worlds in the modal base are ordered according to how many propositions in the ordering source (that is how many "ideal" propositions) they realize, that is, how many ideal propositions are true in some given world. The joint effect of the modal base and the ordering source is to force the evaluation of the modalized proposition in those worlds of the modal base that better realize the given ideal or norm.

The modality of the sentence, thus signals the context of evaluation of the modalized proposition, a set of propositions with respect to which the speaker chooses to consider a particular proposition, in our case the proposition expressed by the infinitive complement.

6.1. ***Contexts of evaluation*** can be arranged in a scale that takes into account how close or how remote they are from the standard context of evaluation. *The standard context is that of a totally realistic (modal) base, identical with the common ground*. A sentence such as *Mary has climbed the mountain* is evaluated in a *totally realistic modal base*, whose *ordering source is null*. Contexts of evaluation are ordered function of their similarity to this standard, with the scale moving from contexts where the ordering source is non-null, so that the sentence is judged to be true in possible worlds conforming to the ideals in the ordering source, to contexts which take into account only what is the case in a particular context of utterance, i.e., the common ground (apud Giorgi & Pianesi (1997)).

(56) non-null > non-realistic > weakly realistic > realistic > totally realistic ordering base

Grammatical mood roughly corresponds to a simplification of such a classification into a binary one. Contexts of evaluation similar to the standard one require the *indicative*, whereas those classified as different require a *non-indicative mood*, the subjunctive or the infinitive. The expectation of such a point of view is that each non-indicative mood is associated with a continuous segment of this hierarchy. It is indeed true, as will be seen soon, that the infinitive and the subjunctive cover continuous segments of this hierarchy, though they do not cover the same portion of the hierarchy, opposing the indicative mood in different ways. In addition to the type of evaluation setting presupposed, the infinitive and the subjunctive also differ as to finiteness, and perhaps other features as well.

Before examining the type of evaluation setting presupposed by infinitive complements, it is important to recall an important classification of main predicates, into weak intensional verbs and strong intensional verbs (cf. Farkas (1994)).

Weak intensional predicates include epistemic verbs (*know, understand*, etc), doxastic verbs (*think, believe, consider*, etc), dicendi verbs (*say, tell, assert*, etc), commissive (promising) verbs (*promise, swear, etc.*). These verbs are modal operators which *introduce only one possible situation* or possible world into the context; it is in this world that the complement clause is supposed to be true. The complement proposition is said to be *extensionally anchored*, because its truth is believed or implied (determined) in the possible world introduced by the verb. In such cases the ordering

source is null, since one obviously cannot order a set containing only one world. Moreover the set of propositions true in the possible world i.e., what is known, thought, communicated, etc.) always intersects with the common ground. In other words what is known is part of what is true, what is believed is in part what is true etc. The evaluation context presupposed is *weakly realistic*. Notice that since a weakly realistic evaluation context is close enough to a totally realistic one, the complement clause of these verbs may use the indicative mood, even if the verbs are intensional modal operators:

(57) He believes / knows / says / promises that he will win.

Let us assume that in complements of weakly intensional verbs, the Inflection (finite or non-finite) head bears a [+realis] feature. The finite [+realis] feature is standardly associated with the indicative, i.e., with truth in the actual world.

Strong intensional verbs, introduce a *set of possible worlds*, necessarily constrained by some ordering source. Strong intensional verbs are desiderative verbs (*want, desire, would like*), exercitive verbs of command (*order, command, etc.*), evaluative / emotive modalities (*be bizarre / odd / bad, etc.*). The complement proposition is said to be intensionally anchored, in as much as *its truth is not at stake*. In English the finite complement of a strong intensional verb, if available, is in the subjunctive, bearing a [-realis] feature.

(58) They demand that their salaries should be raised

6.2. **The infinitive modality.** A general characterization of the infinitive mood against this background would be that the use of the infinitive signals a *non-(total)ly realistic setting* even when the infinitive is used in the main clause, therefore the infinitive, like the subjunctive expresses possible, not real action.

Considering the context of evaluation scale in (56) it appears that *the cut-off point for the use of the infinitive is that of an at most weakly-realistic basis*. The infinitive is thus compatible a) with *weakly realistic* bases (e.g., the infinitive of weak intensional verbs), b) with *non-realistic bases with non-null ordering* bases (e.g. the infinitive of strong intensional verbs).

The infinitive complement selected by weak intensional verbs (doxastic, epistemic, assertive, dicendi, etc) presupposes a weakly realistic base. The modal base has an intersection with the common ground, the infinitive clause is supposed to be true in the unique evaluation world introduced by the main verb. The infinitive complement may have an indicative paraphrase, and the infinitive inflection bears a [+realis] mood feature.

(59) a. I knew him to be lying at once.
I knew that he was lying at once.
b. He is believed to have arrived last night.
It is believed that he arrived last night.
c. They promise [PRO to return the money tomorrow].
They promise that they will return the money tomorrow.

One more situation of [+realis] infinitive is the complement of implicative verbs (Karttunen (1977)) aspectual verbs and factive verbs, as also stressed by Pesetsky (1991). These verbs have the property of entailing the truth / falsity of their complements.

(60) a. They managed to buy the house
b. They bought the house.
c. They continued to lose money
d. They lost the money.

- e. He regretted to lose so much money.
- f. He lost much money

The complement clause is obviously evaluated in the same world as the main clause. If the main clause is true in the real world, the infinitive clause is true in the same world.

The infinitive is also compatible with *non-realistic bases with non-null ordering sources*, introduced by *strong intensional verbs* (desideratives, imperative verbs, evaluative modalities). In this case, the complement is intensionally anchored, the truth of the complement clause is not at stake. The paraphrase, if available, is subjunctive. The Inflection of the infinitive clause bears an irrealis ([-realis]) mood feature.

- (61)
- a. It is good [PRO to spend Christmas with one's family.]
 - a' It is good that one should send Christmas with one's family.
 - b. I wanted [PRO to have a nice family-holiday].
 - c. They wish for him to become president.
 - c'. They wish that he should become president.

The meaning of the infinitive is thus more general than that of the subjunctive, which, as already shown above, presupposed a *non-realistic base and a non-null ordering basis*. As a result, depending on the setting presupposed by the main verb/predicate, the infinitive is paraphrasable as either an indicative or a subjunctive:

- (62)
- a. I knew at once that he was lying.
 - a'. I knew him to be lying.
 - b. It is good that one should spend Christmas with one's family.
 - b'. It is good [PRO to spend Christmas with one's family].

On the other hand the considerable area of overlap between the indicative and the subjunctive (e.g., both are compatible with strong intensional predicates) explains why the infinitive has replaced the subjunctive in many contexts in English, while, languages like Greek have completely eliminated the infinitive, retaining only the subjunctive.

Conclusions

1. The meaning of the infinitive is general and vague enough to allow it to be used in a broad diversity of situations. The infinitive opposes the indicative, in as much as it is not compatible with a totally realistic basis and it appears only with intensional operators. Herein lies the unity of the infinitive.

2. The infinitive Inflection may be characterized as [+realis] when the complement clause is extensionally anchored by a weak intensional predicate, or when the complement clause is entailed by the truth of the main implicative or factive verb. [+Realis] complements are either raising constructions of weak intensional verbs, or control complements of implicative, aspectual and factive verbs.

3. The infinitive Inflection is [-realis] when the infinitive complement is selected by strong intensional verbs. This is the area of overlap between the infinitive and the Subjunctive. Strong intensional verbs uniformly take control constructions (PRO-*to* or *for-to*).

4. The area of the infinitive is more comprehensive in English than in other languages, the infinitive being compatible with realis and irrealis settings.

7. The temporal interpretation of the infinitive clause

In this paragraph we will try to ascertain whether infinitive complements have a contentful [+Tense] feature in T^0 , since we have already proved that a syntactic T position is available in infinitives. Intuitively the question is whether the infinitive verbs may denote a different time sphere from the main clause. More technically, the problem is whether the infinitive clause may establish its own RT, since in such cases the event of the subordinate clause is oriented to its own RT rather than (directly) to the matrix ET. There has been a lively debate around the correct description of the temporal properties of the infinitive, partly because of neglecting the fact that the infinitive is a mood, not a Tense of English. We briefly survey the positions which have been expressed.

The following classes of control taking verbs will be mentioned in the discussion.

- (63)
- a. **Aspectual:**
begin, start, continue, finish, stop, resume.
 - b. **Modal:**
have, need, may, should, is able, must.
 - c. **Implicative:**
manage, fail, bother, remembered, see fit, condescended, avoid, forgot, fail, refrain, decline, neglect, force, compel.
 - d. **Factives:**
glad, sad, regret, like, dislike, hate, loath, surprised, shocked, sorry. (factive predicates also select *For* complements).
 - e. **Propositional:**
claim.
 - f. **Desiderative:**
want, prefer, yearn, arrange, hope, afraid, refuse, agree, plan, aspire, decide, mean intend, resolve, strive, demand, promise, choose, offer, eager, ready. (All of them also select *for*)
 - g. **Interrogatives:**
wonder, ask, find out, interrogate, inquire, contemplate, deliberate, guess, grasp, understand, know, unclear.

7.1. *Are infinitives tensed or untensed complements?* The idea that infinitives have their own tense can be traced back to Bresnan (1972), who observed that infinitives typically describe "hypothetical or unrealized" events. Stowell (1981, 1982) systematically develops this idea, relating it to the difference between raising and control complements. In his view, all and only control complements are [+Tense], since control complements express a future "unrealized", "hypothetical" time different from the time of the matrix. This is what he called "irrealis tense", a term which names a syncretic Tense/Mood property.

In many infinitival control complements, the event time is clearly shifted into the future, as confirmed by the impossibility of using a perfect. Examples of the type below support Stowell's contention:

- (64)
- a. *Ginny remembered [PRO to have brought the wine].
 - b. * Kim decided to have gone to the party.
 - c. * Romario promised Bebeto to have passed the ball.

In contrast, Stowell shows that raising infinitives are untensed, i.e., [-Tense], since they cannot denote a time sphere of their own. In particular, in simple (non-perfect, non-

progressive) infinitive complements, the time interval denoted by the infinitive must coincide with the matrix event.

- (65) a. Everyone believed Rebecca to be the best basketball player at UConn.
b. The doctor showed Bill to be sick.
c. The defendant seemed to the DA [t to be a conspirator].

Stowell's position was taken over by Pesetsky (1991), Martin (1996) Boskovic (1997) who make a difference between the future tensed control constructions, able to license PRO, and the *untensed raising structures*. The strongest argument for Stowell's position that raising predicates lack tense is the inability of raising constructions to license *eventive* predicates in the infinitive clause. "Eventive predicates are possible in control infinitivals, but not in raising ones. There is no Tense feature which could license an event in raising complements."

- (66) a. *Everyone believed Rebecca to win the game right then.
b.* The doctor showed [Bill to take the wrong medicine at that exact time].
c. Rebecca wanted to win the game right then.

Eventive readings are licensed only under progressive *be*, or perfective *have*, not by the simple infinitive form. The simple form is stative, habitual, generic.

- (67) a. Bill believes Mary to often sing the Marseillaise (*right now).
b. Bill believes Mary to be tall / to know the truth.
c. Bill believes Mary to be singing the Marseillaise.
d. Bill believes Mary to have sung the Marseillaise.

In contrast, the presence of a temporal/modal element in control constructions is further proved by the possibility for this element to provide a binder for an event variable.

- (68) Mary is trying to sing the Marseillaise right now.

Landau (1999) further complicates the picture, introducing another criterion. Tensed complements license adverbs of definite time which may establish RT. Untensed complements cannot license such adverbs. This leads to a completely different picture. Not all control complements come out [+Tense] if this criterion is adopted: Among control complement taking verbs, aspectual (*begin, continue, etc.*), modal (*have to*) and implicative verbs (*manage, fail, force* and many more) appear to be untensed.

- (69) a. * *Yesterday*, John began to solve the problem *tomorrow*.
b. * *Yesterday*, he managed to solve the problem *today*.

In fact, it had already been observed by Karttunen (1971) that implicative verbs do not tolerate frame adverbials, that is, tense mismatches between the matrix and the infinitive.

- (70) a. * John remembered to lock his door tomorrow.
b.* John managed to solve the problem next week.
c. *John saw fit to arrive the day after tomorrow.

Sentences like (71) may cast doubt on the claim that implicative complements cannot differ in tense from the matrix clause:

- (71) John managed to have finished his duties on time.

But the interpretation of *have* in this case is strictly perfective. A past tense frame adverbial renders the sentence ungrammatical

If Landau's criterion is adopted, most Acc + Inf constructions come [+Tense]:

- (72) a. *Now* I firmly believe him to have lied *yesterday*. ([+Tense], Raising)
b. *Now* I firmly believe that he lied *yesterday*.
c. *Now* he appears not to have called her *before leaving*.

An exception is that of the Acc + Bare infinitive construction of perception verbs, where distinct frame adverbials cannot occur.

- (73) *Yesterday he saw her arrive tomorrow.

7.2. **Towards an analysis.** The position that we defend comes closest to Stowell's analysis, but takes into account the important modal difference between realis and irrealis infinitives.

Like Stowell, and like all the linguists quoted above we agree that irrealis (control) infinitives are tensed. Actually, the future hypothetical tense is best viewed as *an entailment of the irrealis modality*. The feature [-realis] thus entails the feature [+Tense].

The fact that irrealis control infinitives are tensed also suggests *that they are CPs*, with an independent Tense chain. We will assume that tensed infinitives, have the same syntactic structure as *that* clauses, i.e., they are CPs and have an uninterpretable tense feature in C⁰.

On the other hand, [+realis] infinitives appear to be untensed, at least if we maintain the position that an independent Tense feature has the role of providing an independent RT, possibly acting as a binder for the event of the subordinate clause.

a) Let us first consider the infinitives of aspectual and implicative verbs, which as shown by Karttunen and Landau cannot license independent frame adverbials. We believe that ability to license frame adverbials is a *necessary property* for a clause that has Tense. So it does follow that implicative, aspectual, infinitives are [+realis, -tense]. Against Stowell, these are *untensed control complements*.

While ability to license a distinct frame adverbial is a necessary condition for a [+Tense] feature, it surely is not a *sufficient condition*. Clear evidence that this is so comes from small clauses, which, by definition, lack Tense.

- (74) I wanted [him to be out of my way *in two days*].

In fact, it is known that frame adverbials may establish reference, and thus Tense, but may equally well refer to ET, if some other reference establishing mechanism is available. This is clear in examples like (75) below. The past perfect in the complement below is anterior to the main clause which is the RT, and the adverbial of definite time *at two o'clock* simply designates ET:

- (75) Upon arrival, the police discovered that the thieves had left at two o'clock.

So, we tentatively accept that aspectual and implicative complements are [+realis, -tense].

b) A clarification is necessary regarding factive verbs, which have been claimed to have [+realis, + tense] infinitive complements, invalidating the generalization that the hypothetical Tense feature depends on irrealis modality. We believe, however, that the conclusion that the

infinitive complement of factive verbs is [+realis] is not mandatory. Several empirical facts apparently lead to the view that the infinitive complement of factives may better be described as [-realis].

First, as already discussed in the previous chapters, factives are compatible with both the indicative and the subjunctive moods, i.e. the inflection of their complement I^0 may be either [+realis] or [-realis]. In [-realis] cases, factivity may be lost. Secondly, it is important that infinitive-taking factives, like *regret*, *odd*, *tragic*, are all emotives as well, allowing the *for-to* construction as well as the PRO-to construction.

- (76) a. It is strange for him to act like that.
b. I regret [PRO to say] that your son, Captain Brown has been killed in action.

Since *for-to* complements are tensed, and since at least examples like (76a) accept both a [+realis] indicative and a [-realis] subjunctive paraphrase, we will assign factives the feature [-realis, +tense], maintaining the generalization that the feature [-realis] and [+tense] correlate, as suggested so far.

c) Let us consider raising complements now. First it will be seen that the fact that the raising complements cannot have an individual eventive reading (cf. examples ((66a, b), (67a) above), while correct, is not necessarily an argument that the infinitive is untensed, but may be derived from other morpho-syntactic properties of the English tense system. Several explanations are available (see Gueron (1995) or Giorgi and Pianesi (1997)). All of them relate to the impossibility of sentences like (66a, b), (67a) to the more general fact that the simple present may not have a deictic, imperfective use in English, unlike other languages:

- (77) a. *I believe George to eat an apple now.
b. I believe George to be eating an apple now.
c. *George eats an apple now.
d. George is eating an apple.

This restriction has already been discussed above, in the framework suggested by Giorgi and Pianesi (1997). They claim that, as always with subordinate clauses, the RT of the subordinate clause is the event (ET) of the main clause and establish that any anchoring event (i.e., the ET of the main clause) is punctual. Moreover, the English bare infinitive form is inherently [+perfective], and according to the punctuality constraint, a perfective event (which is inherently structured, and thus non-punctual) cannot be mapped onto a point. In other words, the use of the simple infinitive to show a perfective singular event is impossible. A durative, non punctual form must be used instead. As a result the durative, imperfective stative progressive form must be used both at the present, where the anchoring point is now (always momentary) and in the infinitive construction where the anchoring event is the main clause. Accordingly, one uses the progressive present in independent sentences or the progressive present in the infinitive complement.

- (78) He is reading.
I know him to be reading now.

On the other hand, it is precisely because the time sphere of control constructions is a "hypothetical future", rather than a deictic present, that the simple form of the infinitive is compatible with eventive predications. This problem does not arise for the future interpretation of the bare stem form, because the future does not overlap, but *follows* the anchoring event.

Therefore in this case the simple form may be associated with an event reading, both in independent sentences, and in complement clauses:

- (79) He starts work tomorrow.
I want him to start work him tomorrow.

We would like to consider a different argument meant to show that the infinitive complement of raising verb does not establish its own RT, but forces the ET/RT of the main clause to function as RT. We suggest to compare *that* complements and infinitives with respect to their temporal properties. A good starting point is the comparison of the interpretation of the infinitive with the indicative complements of the same epistemic verbs:

- (80) Tom believed Mary to be pregnant.
Tom believed that Mary was pregnant.

The finite clause has both a shifted reading and a simultaneous reading, as discussed in the SOT clauses. The infinitive clause, however, allows only *the simultaneous reading*.

As known, in the shifted reading, the Past Tense of the main clause, functions as a true past, expressing anteriority to an RT established by the complement clause. The only difference is that the subordinate RT is determined by the main sentence, being equated with the ET of the main clause. The shifted reading is thus possible because the *that* complement clause can identify its own RT, identical to the main clause ET. The shifted reading shows pastness, anteriority with respect to its RT. More technically, we assumed that in the shifted reading the external argument of Tense is a PRO operator which is co-indexed by the c-commanding matrix clause ET argument.

In contrast, we have argued that in the simultaneous reading, the *that* clause behaves as if it were Tenseless. The SOT rule which was proposed by Ogihara (1996) deletes the Past Tense c-commanded by the main clause Past Tense. This amounts to saying that the complement clause cannot define an independent RT. The Tense head, or the external argument of the Tense head, assuming as we did that tense is the relational predicate, must be construed as a free variable, co-indexed with the ET/RT of the main clause. This gives the simultaneity effect.

Since the infinitive clause only has the simultaneous reading, it is natural to attribute to it the same analysis. The clause is [-Tense], i.e., the external argument of Tense is a free variable bound by the main clause tense.

The conclusion we have reached supports Stowell's original claim that some control complements are tensed, while raising complements are untensed. This conclusion is also in keeping with the view that raising complements are IPs, rather than CPs, since in *that* complements, an RT different from that of the main clause could only be the effect of having the external argument of T in CP. With propositional verbs, the infinitive clause is then [+realis, -tense].

Infinitive clauses appear to be non-unitary regarding their temporal properties. This is due to the rather vague meaning of the infinitive, which is sharpened only in combination with the main verbs. We close by quoting a description of the infinitive, due to Portner (1994), which attempts to capture the core meaning of this form. Working in the framework of situation semantics, Portner asserts that the infinitive denotes an *alternative situation* that develops out of a duplicate of the reference situation, the situation denoted by the main clause. The complement clause denotes "a situation which may be viewed as a *continuation* of the reference situation introduced by the main verb."

This formulation has the advantage of suggesting a certain time relation between the main clause (the reference situation) and the complement clause. The situation denoted by the

complement clause develops out of the one denoted by the main clause. The event in the complement clause is non-anterior to that of the main clause, it may be future (the irrealis complements) or simultaneous (the realis complements).

7.3. *The ontological types expressed by infinitive clauses.* Last but not least, infinitive complements are correlated with a variety of ontological types, propositions, events, properties, and there is an expected correspondence between some of these categories and the specific infinitive constructions. *For-to* complements and raising infinitives uniformly express propositions. Bare infinitive complements of physical perception verbs apparently designate events. PRO-to complement designate propositions or properties (see next section).

- (81) a. I consider this novel to be a masterpiece. (proposition)
b. It would surprise me for him not to come. (proposition)
c. I heard the door squeak. (event)
d. It is easy [PRO to cheat]. (property)

Details on the ontological type of the complement clause will be given in the chapters regarding the distribution of the infinitive.

Conclusions

The description we have arrived at is maximally simple.

1. The infinitive clause has syncretic M/T syntactic position, represented by the marker *to*.

2. The semantics of the infinitive basically regards the interpretation of the Mood feature. The infinitive is a particular modality of English, excluding the totally realistic bases, allowing an at most weakly realistic base. Infinitive complements can, however be described [-realis] or [+realis].

3. Only irrealis infinitives have a contentful future [Tense] feature. The hypothetical tense feature is a semantic entailment of the irrealis modality.

4. Realis infinitive complements are [-Tense].

5. The raising / control syntactic difference does not correlate with the presence / absence of tense, but with the absence / presence of anaphoric agreement features licensing PRO.

6. Tensed infinitives are CPs. Thus *for-to* and (some, possibly) all control infinitives are CPs (to be refined below). It will appear below that the [\pm Tense] property of inflection correlates with the IP/CP status of the complement.

8. Other syntactic properties of *for-to* and PRO-to complements

8.1. *Infinitives like that complements show CRP effects.* Like tensed clauses, they may never appear as objects of prepositions

- (82) a. *I would be surprised at [PRO to find myself underwater].
a'. I would be surprised [PRO to find myself underwater]
b. * I would be surprised at for him not to win the prize].
b'. I would be surprised [FOR him not to win the prize].

Similarly they cannot occupy the structural Accusative position in Acc + Inf constructions.

- (83) a. *I consider [[PRO to come] to be easy]]
b. *Bill showed [[for Bill to have won] to be a fact]

Finally they cannot occupy the Nominative position, at least in Inversion structure.

- (84) a. *Is [PRO to win this competition] a problem for you?
b. *Would [for him to win instead of you] be a problem for you?

As with tensed clauses, there are two saving devices: the clause may be preverbal when it is a topic, or it can undergo extraposition. The Extraposition structure is thus an important property of CP complements, whether they are *that* complements or infinitives. *For-to* complements and PRO-to complements extrapose.

- (85) a. [For you to take this course would help you.
b. It would help you for you to take this course.

Extraposition may characterize all case argument positions: subject, direct object, prepositional object.

(86) **Extraposition from Subject**

It is fun [PRO to swim].

(87) **Extraposition from object position**

I suggested it to you [PRO speak to the girl at once].

8.2. In other respects, (for)-*to* -infinitives do not behave quite like tensed clauses or gerunds, displaying certain properties characteristic of PPs. (cf. Stowell (1981)).

a) First of all infinitival clauses are more or less freely ordered with respect to other arguments in the VP such as PPs and adverbials".

- (88) a. John has promised repeatedly [PRO to help us].
b. John has promised [PRO to help us] repeatedly.
(89) a. Frank wants [very badly] [PRO to visit you].
b. Frank wants to visit you very badly.
(90) a. John explained to Bill how to open the jar.
b. John explained 'how to open the jar to Bill.

b) Passivization of the infinitive complements is very problematic. Again we expect untensed infinitives to be unable to passivize, because they cannot in principle appear in SpecT. It is indeed the case that the complements of implicative and aspectual verbs do not passivize:

- (91) John began / continued / started to write.
*To write was begun / continued / started by John.
It was begun / continued / started by John to write.
(92) John managed to get rid of his old car.
*To get rid of his old car was managed by John.
(93) Tom failed to get rid of his old car.
*To get rid of his old car was failed by Tom.

On the other hand passivization of tensed infinitives is attested, contrary to what is claimed in Stowell (1981). Here are examples, with sources indicated. Notice that the verbs involved are desideratives and exercitives, which are tensed complements. Notice also that all examples involve extraposition.

- (94) Mary know it had been recommended [PRO to behave herself in public] (Manzini (1983))
 Mary know it had been prohibited [PRO to reveal herself in public]
- (95) It was prohibited [to speak loudly] (Landau (1999))
- (96) It was decided [PRO to leave earlier] (Chierchia 1989))
 It was recommended [PRO to see the movie].

Alongside of the tense factor, the difficulty of passivizing the infinitive must be related to its categorial status as partly a PP.

c) With respect to topicalization, infinitive clauses show an asymmetry. Subject clauses may topicalize, object clauses may not.

The difference is probably related to Case. Subject clauses merge in SpecVP and cannot remain there, but must move out of their position to satisfy their own needs. This allows them to reach SpecTP, where they are case-identified as a consequence of SHA with the finite T head. This allows them to move to the Topic position leaving behind a case marked trace. Thus Topicalization is helped by the fact that Greed pushes the subject clause out of its base position to position where case can be checked.

As already discussed the possibility of an infinitival complement appearing in SpecT depends on its temporal properties, so that untensed infinitives do not topicalize cf. (Pesetsky 2000)

- (97) ??[PRO to lose the game] proved they were idiots. (realis, -tense)
 [PRO to lose the game] would proved they are idiots (irrealis, +tense)

Object clauses have no reason to leave their base position. It is plausible to relate impossibility of Topicalization to their PP nature. By analogy to the subject case, movement to the Topic position should go through a case-assigning position, say Spec AgrO, but it is reasonable to claim that due to their similarity to PPs infinitives cannot move through the Spec of the Acc Case projection. Hence topicalization of object infinitives does not occur.

- (98) a. I asked John[who to visit]
 a' *Who to visit I asked John
 b. I never expected [PRO to be invited]
 b' *[To be invited], I never expected.

Conclusions

1. Like *that* clauses, control infinitives show CRP effects. They avoid surfacing in structural Case positions.

2. *For-to* and *PRO-to* complements may extrapose.

3. Tensed infinitive complements may be passivized, contrasting with untensed infinitives which do not passivize.

4. Inside the VP, infinitive clauses are freely ordered, their behaviour resembling that of PPs.

