TOWARDS AN ERASURE PRINCIPLE FOR GERMAN AND ENGLISH INFINITIVE COMPLEMENTS

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One of the many grammatical problems that have attracted considerable attention within the framework of transformational grammar but nevertheless have proved resistant to satisfactory analysis is the problem of stating the principles which determine coreference between certain noun phrases in superordinate sentences and the underlying subjects of infinitive and gerund complement sentences. In the present paper I am attempting to propose a solution to this problem. I am confining myself to an analysis of German and English infinitive complements, taking English gerund complements into consideration only so far as they correspond to German infinitive complements. The so-called accusative-with-infinitive constructions and gerund complements with overt subjects occuring in oblique cases lie outside the scope of this analysis because the coreference constraints to be examined do not apply to the derivation of these complement constructions.

This paper is not contrastive in the sense that it expounds differences between infinitive complementation in English and German. It is, however, confrontational in that it points to a semantic phenomenon common to both languages, and presumably shared by other languages, including, as it seems, the Polish language in which there exist analogous problems, as I have taken it from the paper Dr Lewandowska (1976) presented at the 9th International Conference on Polish-English Contrastive Linguistics.

It seems necessary to me, in the first place, to review some of the proposals that have been made with regard to the coreference constraints in the derivation of English infinitive complements, and to point out where these proposals fail as to empirical or descriptive adequacy.

The first extensive analysis of this problem within the framework of transformational grammar was put forward by Rosenbaum (1967). He shows that a

transformational grammar can adequately account for the fact that certain infinitive and gerund complements are understood to have a 'latent' or 'logical' subject not occuring as such in surface structure. In accord with the transformational principle of recoverable deletions, these complements are propounded as having deep structure subjects which are deleted by a transformation applicable under an identity condition. Rosenbaum (1967:6) claims that this identity erasure transformation, now more commonly known as Equi-NP-Deletion, is subject to the following coreference constraint:

The following conditions (henceforth the *erasure principle*) govern the application of the identity erasure transformation. An NP_j is erased by an identical NP_i if and only if there is a S_a such that

(i) NP_j is dominated by S_a
(ii) NP_i neither dominates nor is dominated by S_a
(iii) for all NP_k neither dominating nor dominated by S_a, the distance between NP_j and NP_k is greater than the distance between NP_j and NP_i where the distance between two nodes is defined in terms of the number of branches in the path connecting them.

According to this principle, the complement subject NP_j can only be erased if it is identical, or coreferential, with a certain noun phrase NP_i in the matrix sentence. This NP, henceforth called the controller, is always the one 'nearest' to the complement subject, nearness being measured in terms of the number of branches in a treediagram.

Rosenbaum's Erasure Principle successfully predicts the controller in all cases in which the matrix verb is a two-place predicate, because there is, apart from the complement, only one other NP in the matrix sentences i.e., in sentences like

(1) Peter tried to convince them
(2) Peter preferred to wait until evening

it correctly specifies the matrix subject *Peter* to be coreferential with the 'understood' subject of the infinitive complement. In the case of subject complementation, it correctly specifies the matrix object to be coreferential with the complement subject, as in:

(3) It annoyed Peter to learn that the train was late

For object complementation with three-place matrix verbs, the Erasure Principle always designates the other object as coreferential with the complement subject, but disallows the two subjects to be coreferential. This is correct for the majority of three-place verbs like *accuse, advise, ask, encourage, force, order, persuade, prevent, remind, urge*, and many others, as may be exemplified by the following sentences:

(4) Mary accused Peter of having stolen her dissertation
(5) Mary advised Peter to start early
(6) Mary prevented Peter from getting married
(7) Mary urged Peter to buy a hat

Postal (1970 : 475 f), König/Legenhausen (1972:45 f), and Jackendoff (1972: 208) have pointed out, however, that in sentences with the verbs *promise, swear, vow, make an oath*, and *learn* the Erasure Principle makes wrong predictions because in fact the two subjects are understood to be coreferential.

(8) The poet promised his friends to rhyme no more
(9) The poet swore (vowed) made an oath to Erato to rhyme no more
(10) The poet learned from the archer to hunt with bow and arrow

To these I would like to add the verbs *threaten, offer, owe, affirm, assure, confess, admit, betray, disclose, conceal, deny, boast, apologize*, and *complain*. They exhibit the same exceptional properties with regard to the Erasure Principle, as shown in the following sentences:

(11) The tyrant threatened the poet to have his tongue cut off
(12) The tyrant offered (to) his allies to declare war on their enemies
(13) Peter owes it to his children to vindicate their dead mother's reputation
(14) He affirmed to them never to have been there before
(15) He assured them of being ready to help
(16) He confessed to his friend to having stolen the money
(17) He admitted to the police to having committed murder
(18) He denied to the police ever having been there before
(19) He had never betrayed/disclosed to them having stolen the money
(20) He concealed from his wife having met the woman before
(21) He often boasts to his friends of being the best tennis-player in town
(22) He apologized to his friends for being rude
(23) He complained to his boss of/about having not enough work to do

I am going to comment on sentences like these later on.

It is interesting to note in this connection that infinitive complementation in German corresponds exactly to what has been said about English. Moreover, the translation equivalents of the verbs just mentioned also form exceptions to the Erasure Principle as stated by Rosenbaum. The verbs are: *versprechen, geloben, schwören, drohen, anbieten, schulden, lernen, versichern, gestehen, zugeben, verraten, eröffnen, verheimlichen, bestreiten, sich rühmen, sich entschuldigen, sich beklagen, sich beschweren*. As most of the sentences (8)—(23) have close equivalents in German, it is sufficient to give only a few examples:

(8') Der Dichter versprach seinen Freunden, nicht mehr zu reimen
(9') Der Dichter schwor/gelobte Erato, nicht mehr zu reimen
(11') Der Tyrann drohte dem Dichter (damit), seine Zunge abschneiden zu lassen
(13') Peter schuldet es seinen Kindern, das Ansehen ihrer toten Mutter wiederherzustellen

(16') Er gestand seinem Freund, das Geld gestohlen zu haben

(20') Er verheimlichte seiner Ehefrau, die Frau schon getroffen zu haben

Whereas the majority of these verbs take a surface object in the dative case, a few verbs only occur with a verb-specific prepositional phrase ('verbspezifische Präpositionalangabe'; cf. Engelen 1975 : 161 - 176):

(17') Er gab vor der Polizei zu, einen Mord begangen zu haben

(21') Er rühmt sich oft gegenüber seinen Freunden, der beste Tennisspieler in der Stadt zu sein

(23') Er beklagte/beschwerte sich bei seinem Chef (darüber), nicht genug Arbeit zu haben

In view of these exceptions, the general validity of Rosenbaum's Erasure Principle can no longer be sustained. This is not very surprising if one stops to consider that Rosenbaum tries to explain purely on the basis of structura l considerations what turns out to be very clearly a semantic phenomenon.

Before I go to outline a solution to the control problem on a semantic basis, I would like to comment briefly on a few other proposals that have been put forward by Stockwell et al. (1968), Postal (1970), and Jackendoff (1972).

The objections raised against Rosenbaum's analysis also hold against the solution proposed by Stockwell et al., because it merely constitutes a reformulation of Rosenbaum's Erasure Principle in terms of case grammar. That this is true is evident from their attempt to explain the sentence

(24) He promised us to leave at once

as a 'simple blend' of the two constructions (25) and (26) without presenting any evidence for their assumption (Stockwell et al. 1968:560):

(25) He promised us that he would leave at once

(26) He promised to leave at once

Postal (1970:470 - 476) proposes that the determination of the controller is to be accomplished by three *modal constraints* which he calls the *Ought*, the *Will-Would*, and the *Would-of-intention* modal constraint. Specifically, he propounds that sentences containing infinitive constructions of the kind under consideration here should be derived from underlying structures in which the complement contains a modal. Thus, in the following pairs which serve as examples for the three modal constraints each, the (b) sentences should be considered transformationally derived from the structures underlying the (a) sentences:

(27a) Harry told Max$_i$ that he$_i$ $\begin{Bmatrix} \text{should} \\ \text{ought to} \end{Bmatrix}$ enlist in the army

(27b) Harry told Max to enlist in the army (Postal 1970:471)

(28a) George asked Bill$_i$ if he$_i$ would help Mary

(28b) George asked Bill to help Mary (Postal 1970: 473)

(29a) Harry$_i$ promised Bill that he$_i$ would visit Greta

(29b) Harry promised Bill to visit Greta (Postal 1970:475 f)

Apart from the question of whether the (a) and (b) sentences are really paraphrases of each other, which is certainly doubtful at least in the cases of (27a) and (27b), Postal's proposal leads to difficulties with verbs that do not allow dependent *that*-clauses at all. Thus, for verbs like *beg, beseech, implore*, Postal is forced to require an obligatory rule that transforms the embedded sentence into an infinitive complement (Postal 1970:474). The choice of the correct modal constraint for verbs like these obviously becomes rather arbitrary.

It should be noted that Postal is only concerned with analysing linguistic verbs used non-declaratively. His modal constraints therefore do not apply to a large group of non-linguistic verbs like *force, oblige, prevent*, although they involve controller uniqueness just as the other verbs do. Moreover, Postal does not mention the class of linguistic verbs that require their complements to be *vorzeitig*, i.e., they require the action, process, or state referred to by the complement to be previous to the action referred to by the matrix sentence, as in the following examples:

(30) The police accused/suspected the poet of having stolen the money

(31) He apologized to his wife for having written the letter

It would clearly be absurd to claim the presence of a modal in the deep structure of these gerund complements. Accordingly, no modal constraint is available to explain the differing coreference constraints in sentences like (30) and (31).

The conclusion seems inevitable that the modal constraints neither fully succeed in predicting which particular noun phrase must be the controller in specific cases, nor do they adequately designate the verbs that require controller uniqueness. Although Postal's analysis does not provide a satisfactory solution, it nevertheless points to the fact that the verbs under consideration share a semantic feature which allows for the unique determination of the controller.

Jackendoff (1972:207 - 228) proposes to account for these facts by what he calls *networks of coreference*, which he defines as well-formedness conditions imposed by particular verbs on the semantic representation of sentences in which they occur. The networks of coreference are, in turn, defined with regard to his *thematic relations* with which these verbs are associated in functional sentence structure. The thematic relations may be viewed as being equivalent to Fillmore's case relations; the objections Jackendoff (1972: 34 - 36) raises against this comparison have been removed by Fillmore's (1971a) revision of case grammar. The coreference condition necessary to identify the controller would thus be a function of the thematic relations associated with a particular verb.

It should be pointed out, however, that Jackendoff's proposal does not lead to a generalization of the kind that a certain thematic relation without exception acts as the controller in complement subject deletion under coreference. This entails that Jackendoff has to state his networks of coreference for each verb, or class of verb, individually. Accordingly, he assigns the same set of thematic relations to the verbs *permit* and *force* as to verb *promise* (1972 : 216 f), which requires him to state that for the first two verbs control lies with the thematic relation that is ordinarily realized as surface object, whereas for *promise* it is the thematic relation that ordinarily forms its subject.

Apart from these shortcomings, Jackendoff's proposal again supports the conclusion arrived at above that the coreference constraints under discussion are a function of certain semantic features common to predicates that allow infinitive and gerund complements, because his thematic relations may be considered as general semantic properties of predicates.

I would now like to show that it is possible to avoid having to mark each verb individually for control. This seems feasible to me on the basis of case grammar. I propose to refer to the following set of semantic case relationships, which are given below together with shortened versions of Fillmore's definitions of them (Fillmore 1971a:41):

Agentive   (A) instigator of an action, animate
Experiencer (E) the affected of a psychological event or in a mental state, animate
Instrumental (I) instrument; stimulus in a mental event
Objective   (O) semantically most neutral case
Source   (So) the origin or starting point of an action
Goal   (G) the receiver, or end point, of an action

For obvious reasons, I cannot go deeply into the problem of how particular predicates can be shown to associate with one or several of these cases. It must be sufficient to mention that a number of syntactic tests, such as the imperative test, the *do-so* test and the *happen* test, may serve for distinguishing among Agentives, Experiencers, and Objectives (cf. Cruse 1973 and Dillon 1974). Other paraphrase tests may be available for identifying Instrumentals (cf. Nilsen 1972 and 1973). I must, however, go into the question of how Source and Goal are to be assigned to particular verbs, because it will prove essential to the following argument.

Abstracting from their originally locative meaning, Fillmore uses these two cases to account for the converse relation between verbs like *lend* and *borrow*, or *sell* and *buy*. Two lexically distinct predicates are said to be the converse of each other if they imply each other, and if the lexical substitution of one term for the other coincides with a reversal in the position of two of their noun

phrases. This may be illustrated by the following examples in which I have indicated the case roles non-formally:

(32a) *The poet* sells *roses to schoolgirls*.
    A=So   O   G

(32b) *Schoolgirls* buy *roses from the poet*
    A=G   O   So

By allowing two separate underlying cases to be represented by a single surface noun phrase, Fillmore is moreover able to explain the well-known differences and similarities in the meaning of the verbs *give*, *get*, and *take*:

(33a) *Peter* gives *the book to Mary*
    A=So   O   G

(33b) *Mary* gets *the book* from Peter
    G   O   So

(33c) *Mary* takes *the book from Peter*
    A=G   O   So

To indicate the difference between (33b) and (33c) as each being the converse of (33a) I suggest we call sentences like (33b) *process-converses* and sentences like (33c) *action-converses*. The three of them all imply unilaterally the following *result-sentence*:

(33d) Mary has the book

This way of accounting for converseness receives further independent support from the results of Bendix' (1966:76) feature analysis of *give*, *get*, *take*, *lend*, *borrow*, and a few other verbs.

It follows from these considerations that the best way of establishing that a given predicate has Source and Goal among its cases is to show that it has at least one converse term. Let us therefore examine another well-known pair of converse verbs, namely *teach* and *learn*, which may, as opposed to the verbs examined before, take infinitive complements as their objects. Consider the following examples, where I have again indicated the cases non-formally:

(34a) *The archer* taught *the poet to hunt with bow and arrow*
    A=So   G   O

(34b) *The poet* learned *from the archer to hunt with bow and arrow*
    A=G   So   O

(34b) has been given above as a counterexample to Rosenbaum's

Erasure Principle. It is important to observe that in both (34a) and (34b) the noun phrase understood to be coreferential with the erased complement

subject is *the poet*. The same coreference condition obtains in German, as may be illustrated by the translation equivalents of (34a) and (34b):

(34a′) *Der Bogner lehrte den Dichter, mit Pfeil und Bogen zu jagen*
         A=So   G   O

(34b′) *Der Dichter lernte vom Bogner, mit Pfeil und Bogen zu jagen*
         A=G   So   O

In each of the four sentences, the Goal in the matrix sentence mst be then controller. This is obviously the point where the controller problem and the converseness analysis converge. If a semantic erasure principle can be formulated in terms of case relationships at all, and it must be kept in mind that case relationships represent certain general semantic properties of predicates, the consideration of these sentences leads to the conclusion that the controller is determined on the basis of the Source-Goal relation.

To support this proposal, it would, strictly speaking, be necessary to show that each of the large group of verbs like *permit, advise, ask, accuse, force*, has a converse. As all of these verbs require their surface objects to be coreferential with the deleted complement subject, we are led to assume, on the analogy of *teach*, that their objects are Goals. These verbs, however, do not appear to have lexically distinct converse terms either in German or in English, whereas they all permit of grammatical conversion, i.e. passivization. It is a well-known fact that the passive transformation does not affect the coreference relation under discussion, and a passivized sentence may be said to correspond to the process-converse mentioned above.

Another way out of this dilemma is to use paraphrases with corresponding verbal nouns, e.g.:
(35a) John permitted the children to go to the zoo
(35b) John gave the children permission to go to the zoo
(35c) The children got permission from John to go to zoo
The last sentence correlates with the passive version of the first one:
(35d) The children were permitted (by John) to go to zoo
The corresponding result-sentence would be as follows:
(35e) The children had permission to go to the zoo
This may not, under closer examination, prove to have a general application, because such paraphrases are not available for each of these verbs, but it certainly supports the analysis under the given conditions.

It should be observed, however, that these paraphrases do not seem to distinguish verbs like *permit* from verbs like *promise*, as is evident from the following examples as compared to (35a—c):
(36a) The poet promised his friends to rhyme no more
(36b) The poet gave his friends the promise to rhyme no more
(36c) His friends received the promise from the poet to rhyme no more

In view of these similarities, Jackendoff (1972:214 - 219) is led to assume the same set of thematic relations for *permit* and *promise*. Observe, however, that the process-sentences with *promise*, as opposed to those with *permit*, are very odd if the Agentive is left out:
(36d) *His friends received the promise to rhyme no more
(36e) *His friends were promised to rhyme no more
The German translation equivalents with *versprechen* exhibit the same oddness, while those with *erlauben* do not:
(36d′) *Die Freunde erhielten das Versprechen, nicht mehr zu reimen
(36e′) *Den Freunden wurde versprochen, nicht mehr zu reimen
(37)   Die Kinder erhielten die Erlaubnis, in den Zoo zu gehen
On the other hand, sentences with nominalizations instead of infinitive complements are quite acceptable:
(38)   John was promised an expeditious consideration of his application
(38′) Hans wurde eine schnelle Bearbeitung seines Antrages versprochen
Thus, it seems that the sentences (35)—(38) do not clearly support the assumption that the surface object of the verb *promise*, in contradistinction to *permit* and similar verbs, is not Goal but some other case. It is therefore necessary to produce some more evidence.

For this, let us in the first instance consider more closely the list of verbs given above as exceptions to Rosenbaum's Erasure Principle. Apart from *learn*, which has already been attended to, and *owe*, which I propose to deal with shortly, they are verbs that denote specific linguistic performances. This is true also for *offer* when it is used with an infinitive complement. The greatest common semantic measure for the objects of these verbs therefore is the feature *hearer of a specific linguistic performance*, which may be marked positively or negatively, thus accounting for verbs like *conceal*.

In contrast to this, the other group of three-place verbs, such as *permit, accuse, force, suspect, prevent*, also includes non-linguistic verbs, and consequently their objects do not allow of the same common characterization. For them, the greatest common semantic measure more generally is the feature *participant affected by the action or process denoted by the verb*. The definition must include *process* to account for the objects of Experiencer verbs like *envy* and its German counterpart *beneiden*, e. g.:
(39) The boy envied the other children for being allowed to play outside
(39′) Der Junge beneidete die anderen Kinder (darum), draußen spielen zu
        dürfen
These two characterizations may seem rather vague, but it must be kept in mind that they constitute generalizations which are to cover a considerable number of almost disparate applications.

It is important to observe that the salient point of these characterizations is the distinction between two different kinds of objects. Although they appear to

coincide in the case of verbs like *accuse*, it can be shown that they must be kept apart. This is evident from instances where the two co-occur, e.g. in the German sentence:

(40) Maria beschuldigte *Peter vor allen Leuten*, ihre Dissertation gestohlen zu haben

It is not even necessary that the accused person is actually present when the accusation is made, e. g.:

(41) Während seiner Abwesenheit beschuldigte Maria *Peter allen*

Leuten gegenüber, ihre Dissertation gestohlen zu haben. A literal translation of this sentence would be as follows:

(41′) While he was absent, Mary accused *Peter in front of everybody of* having stolen her dissertation

The possibility of the two kinds of objects co-occuring is due to the fact that any linguistic verb notionally implies the presence of a hearer, although not all of them allow it to occur in surface structure. Thus, it was possible to quote sentences like (17) and (21) as counterexamples to Rosenbaum's Erasure Principle:

(17) He admitted to the police to having committed murder

(21) He often boasts to his friends of being the best tennis-player in town

With verbs like *admit* and *boast*, *that*-clauses are usually preferred to infinitive complements when they co-occur with this kind of object. That accounts for the impression that sentences like (17) and (21) are somewhat unusual, although they are in the opinion of a native speaker by all means grammatical. In English, these verbs apparently require their objects almost invariably to take the preposition *to*, with the exception of *conceal* which takes *from*, whereas the corresponding German verbs take the prepositions *zu, vor, gegenüber* and *bei*. It has already been pointed out, however, that in German there is with objects of this kind no clear-cut distinction between those that require these prepositions and those that are datives morphologically.

Moreover, it is interesting to observe in this connection that in both English and German there are other verb-specific prepositional phrases which in fact impose a secondary coreference constraint on the complements to verbs that ordinarily do not impose them. Thus, (41′) may be compared to the following sentences:

(42) Mary said to her friends *about Peter* that he had stolen her dissertation

(43) *Mary said to her friends *about Peter* that Bill had stolen her dissertation

The latter sentence obviously is meaningless in that the complement does not refer to *Peter*, unless one assumes that *Peter* is a girl referred to by the pronoun *her*.

All this seems to support the assumption that the objects of the verbs just discussed are semantically distinct from those of the other verbs. At this point I cannot go into the question of whether it is possible to identify the

former with one of Fillmore's cases. To leave the question open for the time being, let us call it the X case.

There is, however, evidence that the characterization of X, as opposed to that of Goal, has to be slightly modified. For this, consider the following quotation from the *OED* (s. v. *oblige*):

(44) In gratitude for the bequest of Preston, the town council obliged *themselves to his son* to build that aisle to his memory

Oblige obviously belongs to the class of verbs that take a Goal object, and accordingly *themselves* is to be classified as such, while *to his son* can only be assigned to case X. The same is true of the corresponding German verb *verpflichten*:

(44′) Aus Dankbarkeit für Prestons Vermächtnis verpflichtete *sich* des Stadtrat *seinem Sohn gegenüber* (dazu), das Seitenschiff zu seinem Gedenken zu erbauen

Although *oblige* and *verpflichten* seem to be linguistic verbs here, they can also be used in a non-linguistic meaning. Thus, the characterization of X should be modified so as to include possible non-linguistic verbs. I would suggest the following: *participant involved in (but not affected by) the action, process, or state denoted by the verb*. The characterization must include *state* to account for verbs like *owe*, as we are going to see immediately.

Now, it is relevant to compare the verb *oblige oneself* with *promise, swear, vow*, and *threaten*. They all denote the performance of a speech act that, to different degrees, binds the speaker to the hearer with regard to a future action for or, in the case of *threaten*, against the hearer. *Oblige oneself* can be said to be the superordinate term, while the other three verbs are its hyponyms, i.e. they each imply the superordinate term (cf. Lyons 1968:453 - - 455).

This comparison points to a very interesting conclusion. Consider the following set of sentences:

(45) They obliged *themselves to the son* to erect a statue to the memory of his father

(46) They promised/threatened/ swore to/ vowed *to the son* to erect a statue to the memory of his father

(47) They owed it *to the son* to erect a statue to the memory of his father

We can observe that the object representing Goal in (45), i.e. *themselves*, does not appear in the sentences (46) and (47), whereas case X, i.e. *to the son*, appears in three of them. (47) is obviously the result-sentence of (45) and (46), differing notably from other result-sentences in that *owe* requires an object.

For these reasons, we are led to assume that *promise, threaten, swear*, and *vow* incorporate the missing Goal, which it seems must be coreferential with the surface subject. In other words, the verbs under consideration are semantically reflexive.

The same conclusions are valid for German, as can be inferred from the following sentences:

(45′) Sie verpflichteten *sich dem Sohn gegenüber*, eine Statue zum Gedenken an seinen Vater zu errichten

(46′) Sie versprachen/drohten/schworen/gelobten *dem Sohn*, eine Statue zum Gedenken an seinen Vater zu errichten

(47′) Sie schuldeten es *dem Sohn*, eine Statue zum Gedenken an seinen Vater zu errichten

Furthermore, this conclusion can be corroborated by comparing some English verbs which I have already mentioned as constituting exceptions to Rosenbaum's Erasure Principle to their reflexive German counterparts, i.e. *offer/sich erbieten, apologize/sich entschuldigen, complain/ sich beklagen, boast/sich rühmen.* For reasons of space, I cannot go into details in this paper.

My aim would be to show that in all instances in which verbs as those examined above impose coreference constraints not only on dependent infinitive complements, but also on other complements such as *that*-clauses, the Source-Goal relation is relevant to coreference.

The result of the present paper is the following Erasure Principle: The Goal of the matrix verb deletes the subject of the infinitive complement.

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