

## ON THE CONCEPT OF 'INSTRUMENTAL' CASE

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0.1. In Fillmore (1968) Instrumental (I) appears as a label attached to one of the possible categories characterizing various relations which may obtain between Noun Phrases (NP's) and the Verb (V) of the Proposition, along with such other "cases" as Agentive (A), Dative (D), Factitive (F), Locative (L), and Objective (O). Instrumental is described as "the case of the inanimate force or object causally involved in the action of the state identified by the verb". Under Fillmore's proposal I is thus one of the categories which can appear in expansions of P following the following general rule schema:

$$(1) P \rightarrow V + C_1 + \dots + C_n$$

where the expansions can be realized as V+A, V+O+A, V+D, V+O+I+A, etc. In the dictionary particular verbs are represented in terms of "frame features" indicating sets of case frames into which particular verbs can be inserted. A particular verb can appear in more than one frame. For example, *open in the door opened* appears in the frame  $\_ O$ , while in *John opened the door* the same verb appears in the frame  $\_ O+A$ . In *the wind opened the door* the verb *open* is assumed to appear in the frame  $\_ O+I$ , whereas in *John opened the door with a chisel* the frame is  $\_ O+I+A$ . The subjectivization transformation accounts for the fact that a particular NP with its case label becomes the subject of the sentence. It is convincingly argued that subject (and consequently object) are notions which can only be related to the surface structure of sentences and that, in most cases the NP which becomes the subject in the surface structure is not marked as such in the deep structure. Instead, the following general rule applies: "If there is an A, it becomes the subject; otherwise, if there is an I, it becomes the subject; otherwise the subject is the O"<sup>1</sup>. Thus in *John opened the door*, *the key opened the door*, *the door opened*, Agentive, Instrumental and Objective NP's, respectively become subjects, since the verb *open* appears in the frames  $\_ A+I+O$ ,  $\_ I+O$ , and  $\_ O$ .

<sup>1</sup> In Langendoen (1970) this rule is expanded to cover other cases suggested by him, e.g. location or two patients.

0.2. In the UCLA English Syntax Project (UESP), Instrumental is, likewise, considered to be one of the primitive case categories characterizing the relations between NP's and the V in the rules of the Base. The appropriate rule states this situation as follows:

$$(2) \text{ Nom} \rightarrow \left\{ \begin{array}{l} \text{Nom S} \\ \text{N (Neut) (DAI) (Loc) (Ins) (Agt)} \end{array} \right\}$$

where Neut corresponds to Fillmore's Objective, while  $\text{Nom} \rightarrow \text{Nom S}$  is "a recursive rule which if reapplied allows a series of restrictive relative clauses to stack up". (UESP, 1968 : 34).

1.1 In the present paper I wish to 1. argue on the basis of syntactic evidence that Instrumental cannot be treated as a primitive case category on a par with Agentive or Objective (neutral), but rather that each occurrence of surface structure exponents of what Fillmore et al. call Instrumental involves an instance of an embedded sentence in the underlying structure; 2. demonstrate that, semantically, the so-called Instrumental is not a simple relation but that on the contrary it is a complex consisting of various semantic relations; 3. to propose a theory which attempt to explain the facts presented in 1 and 2.

Lakoff (1968) assumes that instrumental adverbs involve in the deep structure the presence of the verb *use* with its object NP realised as the surface structure instrumental adverb. At the same time he claims that the notion Instrumental should be restricted in such a way as to cover only those sentences which express purposive actions with animate agent present or implied in the deep structure. By examining selectional restrictions and co-occurrence relations of synonymous but superficially different constructions and by restricting the scope of the notion of Instrumental in the way mentioned above, Lakoff is able to show that sentences like

- (3) John hit Bill with a hammer  
and (4) John used a hammer to hit Bill

have the same deep structure. On the other hand, non purposive readings of sentences like

- (5) I cut my foot with a razor (=on a razor)  
(6) Olaf broke the glass with a broomstick

according to Lakoff do not contain instrumental adverbs. As such they do not constitute counterexamples to Lakoff's claim that all instrumentals involve sentences with *use* in the "instrumental sense" (as opposed to *use* in the generic sense and *use up*). It seems to follow from Lakoff's argument that every instance of the occurrence of Instrumental in

a sentence requires the presence of Agentive NP with the verb *use* in the deep structure, even if this NP is only a pro-form, subsequently deleted in those cases when Instrumental NP (object of *use*) becomes the surface structure subject of the main sentence as in *the key opened the door* presumably paraphraseable as *somebody used the key to open the door* and *somebody opened the door with the key*<sup>2</sup>. On the other hand Lakoff, unlike Fillmore, would probably refuse to recognize the subject NP in *the wind opened the door* as Instrumental, on the grounds that no agentive, i.e. no animate, purposive force is involved in the action of opening the door expressed by the sentence in question.

1.2. In an earlier paper (Krzeszowski 1971), in an attempt to formalize the deep structure for two English paraphrases

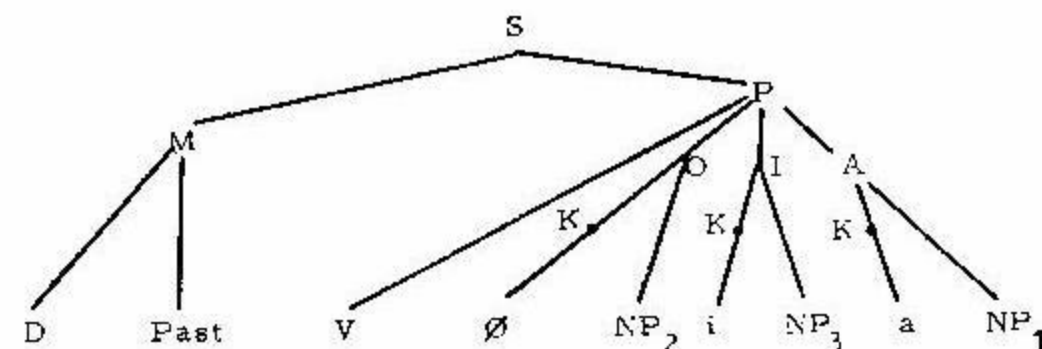
- (7) Seymour sliced the salami with a knife  
(8) Seymour used a knife to slice the salami<sup>3</sup>

and their Polish equivalents

- (9) Seymour pokrajał salami nożem  
(10) Seymour użył noża by pokrajać salami

I proposed the following deep structure for the four sentences:

(11)



where D — declarative modality, i — exponent of I on the surface (with or *use* in English and instrumental inflection or *przy pomocy*+gen or *użyć*+gen in Polish), a — surface exponent of A (by in English and *przez*+acc in Polish).

1.3. I now believe that although it accounts for the paraphrase relation between (7) and (8) as well as for the equivalence relation between (7)/(8) and (9)/10, this deep structure is not correct for the four sentences in question. Specifically, I think that the so-called Instrumental cannot be considered as a primitive notion and member of the same proposition as A or O but that is derived from two propositions both involving

<sup>2</sup> Note that the transformation deleting Agentive must operate before subjectivization to provide the conditions for the general rule subjectivizing Instrumental and mentioned on p. 105.

<sup>3</sup> Quoted from Lakoff (1968).

Agentive and related to each other in a way to be described in detail in sections 4 and 5. Below are some syntactic arguments supporting the above claim.

2.1. The first bit of evidence was offered by Lakoff himself (Lakoff 1968). Since (8) contains two verbs it must also contain at least two propositions in the deep structure. From the identity of deep structures for (7) and (8), proved on the basis of the identity of selectional restrictions and co-occurrence relations, Lakoff concluded that (7) must also contain at least two verbs in the deep structure even though it contains only one verb in the surface structure. The other verb gets deleted by one of the transformations deriving (7) from the same deep structure from which (8) is derived.

2.2. The force of this argument is somewhat weakened by the existence of sentences containing *with*-instrumental adverbs which are not synonymous (cannot be paraphrased into) sentences with instrumental *use*, e.g.

- (12) He summoned Bill with a jerk of the chin  
 (13) \*He used a jerk of the chin to summon Bill

Conversely, there are also sentences with *use* in the instrumental sense which cannot be paraphrased into grammatical sentences with *with*-instrumental adverbs, e.g.

- (14) John used his influence to obtain a better job  
 (15) John obtained a better job with his influence

This problem will be taken up and more examples will be discussed in § 3.

2.3. The second bit of evidence is based on the fact that unlike exponents of other cases "instrumental adverbs" can be omitted without ruining well-formedness of a sentence. Consider the following sentences<sup>4</sup>:

- (16) Peter opened the tin *with a nail*  
 (17) She heard *the noise*  
 (18) He listened to her voice  
 (19) He brought *a parcel* with him  
 (20) I hit *the wall*  
 (21) Mary gave Peter *a banana*

In all these sentences, except (16), the underlined words, the exponents of what Fillmore calls Agentive, Dative, Objective and Locative cannot

<sup>4</sup> Instrumental is not the only case which can be omitted in this way. Certain occurrences of Neutral can also be omitted without causing ill-formedness of the sentence, e.g. in He filled the pool *with water* (Neutral). Cf. the discussion on p. .

be omitted without resulting in an ungrammaticality. The fact that the exponents of the so-called Instrumental case in the sentences containing *with*-phrases can be omitted suggests that Instrumental NP's are less intimately connected with V's than are other NP's and that in the deep structure they may be members of case frames for another verb e.g. *use* or other semantically related verbs.

2.4. Certain verbs like *kill*, *reduce*, *destroy*, *ruin*, etc., expressing completion and change of state from being to not being (inchoative semantic aspect) cannot co-occur with adverbials of frequency and object singular NP's of constant reference. Thus sentences like

- (22) \*John killed Mary three times  
 (23) \*Philip reduced the chair to rubble over and over again  
 (24) \*He destroyed his first painting

frequently are ungrammatical. Consequently similar sentences with instrumentals expressed as *with*-phrases are also ungrammatical:

- (25) \*John killed Mary with a burin three times  
 (26) \*Philip reduced the chair to rubble with his fist over and over again  
 (27) \*He destroyed his first painting with a lancet frequently

On the other hand, adverbials of frequency can co-occur freely with instrumental use and its object NP:

- (28) John used a(the) burin three times to kill Mary  
 (29) Philip used his fist over and over again to reduce the chair to rubble  
 (30) He frequently used a lancet to destroy his first painting

This difference can only be accounted for when a two-predicate derivation of Instrumental is postulated. Otherwise the adverbial of frequency would have to refer to a single proposition e.g. V+A+O+I+Adv—f and one of two embarrassing situations would result: either co-occurrence restrictions on verbs like *kill*, *destroy*, etc. and adverbials of frequency could not be stated at all in order to allow for the derivation of sentences like (28), (29) and (30), or else with the co-occurrence restrictions properly stated (28), (29) and (30) could not be derived at all. The two-predicate analysis of Instrumental handles the situation quite easily. For (26) and (29), (31) and (32), respectively can be postulated as deep structures:

- (31) \*((Philip used his fist) Philip reduced the chair to rubble over and over again)  
 (32) ((Philip used his fist over and over again) Philip reduced the chair to rubble)

In the dictionary the verb *use* will be marked as freely co-occurring with adverbials of frequency, whereas the verb *reduce* and other similar verbs will not be so marked. In this way the derivation of (31) will be blocked.

3.1. Having presented some syntactic evidence for a two-predicate analysis of Instrumental, let me now pass on to the demonstration of the semantic complexity of what was believed to be a primitive case even if somewhat vaguely defined as "the case of inanimate force causally involved in the action or state identified by the verb". It will become evident that the semantic complexity of the so-called Instrumental has syntactic repercussions which render it possible to postulate a variety of underlying semantic structures for sentences with "instrumental" *with*-phrases. Our discussion will be based upon a series of examples taken from the current literature. In each example the underlined words are said to be exponents of the Instrumental case:

- (33) (i) *The key* opened the door  
 (ii) *The wind* opened the door  
 (34) (i) John (accidentally) frightened Mary  
 (ii) *The key* frightened Mary  
 (iii) *The portrait* amazed Mary  
 (35) (i) Mary was frightened by *John's behaviour*  
 (ii) Mary was amazed at *John's behaviour*  
 (iii) He is interested in *architecture*  
 (iv) Mary was frightened by *the key*  
 (36) (i) Peter filled the glass *with water*  
 (ii) Mary covered the table *with cloth*  
 (37) (i) *He used the telephone* to annoy his teacher  
 (ii) He annoyed his teacher *with the telephone*  
 (38) (i) He summoned Phil *with a jerk of the chin*  
 (ii) He answered them *with a little bang of one fist upon another*

3.2. As Huddleston rightly points out (Huddleston 1969 (33 i) presupposes some unexpressed agentive participant, whereas (33 ii) does not. This is so since *the wind* in (33 ii) itself functions as agent while *the key* in (33 i) does not<sup>5</sup>. Hence it is impossible to paraphrase (33 i) as

(39) The door was opened *by the key*<sup>6</sup>  
 whereas it is perfectly grammatical to say

<sup>5</sup> For arguments justifying the claim that the distinction between Agent and Force or Agentive Causer and Non-Agentive Causer is superfluous see Huddleston (duplicated).

<sup>6</sup> In fact such NP's as *the key* can appear as Agents but only when recategorized. Cf. Lyons (1968 : 298).

(40) The door was opened by the wind

It is therefore necessary to conclude that (33 ii) contains the subject NP which is semantically different from the subject NP in (33 i) in spite of Fillmore's having labelled them both as Instrumental. As concerns sentences like (33 i) it must furthermore be observed that they do indeed presuppose the existence of an agentive participant. Without such a presupposition they are merely ungrammatical as is the case with some sentences involving Instrumental in which it cannot be subjectivized. Consider the ungrammaticality of

- (41) \*a sliderule computed the answer  
 (42) \*a new brush painted the wall  
 (43) \*a poker stirred the coal between the bars

In view of the foregoing discussion, the semantic and syntactic differences between (33 i) and (33 ii) will have to be grasped at the level of underlying structure in such a way that for (33 i) the Agentive NP will have to be postulated. It could be optionally deleted by the transformational component. This will account for the fact that it is possible to paraphrase (33 i) as

(44) Somebody opened the door with the key

and that (33 ii) cannot be analogously paraphrased. A more detailed proposal along these lines will be presented in § 5.

3.3. Both sentences in (34) are only superficially similar to (33 i) and they are only superficially different from those in (35). The subject NP's in (34) are related to the V in a somewhat different way from the way the subjects are related to the V in (33). In all three sentences of (34) the source of Mary's fear or amazement was not so much rooted in the entities themselves referred to by the respective NP's ("John", "the key", "the portrait"), but in the way these entities behaved or looked or were involved in some actions or processes. The sentences in (34) are all *vague* with respect to stating the actual reason of Mary's feelings. This speculation is given more substance if sentences in (34) are compared with those in (35). It appears that syntactically they are related since on the one hand the underlined words in (35) can be subjectivized to yield

- (45) John's behaviour frightened Mary (=John frightened Mary)  
 (46) John's behaviour amazed Mary  
 (47) Architecture interested him  
 (48) The key frightened Mary

and on the other hand the sentences in (34) can be paraphrased as

(49) Mary was frightened by John (= John's behaviour, or the way

John looked, or the way John wanted to kiss her, or indeed anything that John did or didn't do)

- (50) Mary was frightened by the key (= the way the key looked, or anything that happened to it).

These facts, displaying the semantic vagueness of the sentences in (34) in contrast with the sentences in (33) suggest that it may be necessary to postulate a sort of underlying structure for sentences like (34) and (35) in which a whole proposition (however referentially opaque) will function as Agent causing the emotions expressed by the verb in the main sentences. A proposal along these lines is presented in § 5.

3.4. The sentences in (36) represent an interesting subclass of sentences containing the so-called instrumental adverbs in that these sentences are ambiguous between at least two readings. Upon one reading *the table* and *the glass* are exponents of Locative, while *water* and *cloth* are exponents of Objective. The other reading involves the Instrumental interpretation under which the sentences in (36) are synonymous with

- (51) Peter used water to fill the glass  
(52) Mary used cloth to cover the table

The sentences in (36) are different from other Instrumental sentences on yet another count: they do not admit of the subjectivization of the Instrumental NP's. Observe that the Subject-NP in

- (53) *Water* filled the glass  
(54) *Cloth* covered the table

can only be interpreted as the exponents of Objective and not as Instrumentals. In view of the fact that a large class of English sentences with Instrumentals do admit of this sort of subjectivization it must be concluded that sentences like those in (36) must be set apart as different in this respect. The grammatical consequence of this fact is that verbs like *fill*, *cover*, etc. must be defined in the dictionary as incapable of being inserted into strings where Instrumental NP's function as subjects. As a consequence of this restriction sentences like (53) and (54) can only be interpreted locatively and never instrumentally.

3.5. The sentences in (37) contain instances of the so-called factive verbs, which can take factive nominals as subjects. Prima facie (i) and (ii) of (37) are identical with other Instrumental sentences e.g. with

- (55) He used the telephone to hit his teacher

Closer scrutiny reveals some significant differences. First of all, unlike in (55) the sentences appearing *to-phrases* in (37) observe very few constraints with respect to their form or contents. As a matter of fact any declarative, agentive sentence, either positive or negative could do, e.g.

- (56) He used to talk about colorless green ideas which sleep furiously to annoy his teacher

(57) John did not want to marry a Norwegian to annoy his teacher

In the sentences like those in (55) only sentences containing verbs with Agentive and Objective NP's as their subjects and objects can be used to precede *to-phrases* and a small class of these at that. This situation is a result of the fact that the so-called factive verbs take as their subjects any sentences inserted into the string "the fact that S" which appears in the deep structure of such sentences. The difference between sentences such as those in (55) and sentences with a factive verb as the main predicate resides in the fact that only in the former type of sentences the verbs in the two constituent propositions must be co-referential with respect to the events referred to. Note that it is possible to say

- (58) He used the telephone on Monday to annoy his teacher on Friday (=By using the telephone on Monday he caused his teacher's annoyance on Friday)

also

- (59) He annoyed his teacher on Friday by using the telephone on Monday

However, it is impossible to say

- (60) \*He used the telephone on Monday to hit his teacher on Friday  
nor  
(61) \*He hit his teacher on Friday by using the telephone on Monday

In 4) a theory employing the concept of co-referentiality of events (in addition to the co-referentiality of NP's) will be used to deal with these problems. The sentences discussed in this section constitute yet another sort of evidence for my claim that Instrumental is semantically more complex than has previously been thought.

3.6. Finally, the sentences in (38) represent yet another illustration of the complex syntactic and semantic nature of Instrumental. In all these sentences the main verb is one of the verbs denoting communication, i.e. such verbs as *address*, *speak*, *summon*, *answer*, etc. The sentences in (38) are ambiguous between at least two readings. Upon one reading the *with-phrases* are adverbs of accompanying circumstance, upon the other reading the same phrases are Instrumental adverbials. If interpreted instrumentally these sentences can be paraphrased in such a way that the main verb becomes infinitive of purpose while the instrumental nouns of the *with-phrases* become verbs, derivationally related to these nouns. As verbs they function as predicates in the main clause. At the same time

the objects of prepositions in the prepositional phrases modifying the instrumental nouns in sentences like (38) correspond to direct objects of verbs in the paraphrases. In this way (38 i) becomes

(62) He jerked the (his) chin to summon Phil

(63) He banged one fist upon another to answer them

The presence of paraphrases of this sort for sentences like those in (38) makes those sentences different from other sentences with instrumental. Although at present I am not able to account precisely for this sort of paraphrase relation some suggestions will be given in § 5.

3.7 On the basis of syntactic criteria supporting intuitive feeling about the complex nature of Instrumentals I have tried to justify my initial claim that the deep structure of sentences containing the so-called Instrumental is more complex than it has been assumed in the current literature. Specifically, I have tried to show that the various kinds of Instrumentals can be accounted for only if a two-predicate analysis is postulated as well as admission is made that Instrumental is semantically complex and that because of this complexity it must be derived from a variety of sources.

4.1. The theory which I am going to employ in the explication of the so-called Instrumental case makes use of a formal apparatus only remotely related to those variants of TG which are meaning-based<sup>7</sup>. It involves the initial assumption that semantic structure is universal. As such it constitutes input to particular grammars which are different with all natural languages. Any grammar of a natural language is a diversifying device accounting for surface differences between various natural languages. Grammatical rules operating in a language  $L_1$  translate word-forms of  $L_1$  into the universal language of the semantic structure and vice versa, translate semantic structure into the surface structure representations. Thus the semantic structure constitutes input to all grammars of all natural languages. These grammars can be but do not have to be transformational grammars. Their output are well-formed sentences of particular languages.

4.2. A grammar of a natural language must consist of 1) universal semantic input, where the fundamental semantic relations, i.e. the meaning of sentences, are represented in the form of universal, category-neutral, semantic input to sentence derivation; 2) categorial component, where language specific rules assigning various categories such as sentence, noun phrase, verb, adjective, tense, modal, demonstrative, etc. to various por-

tions of the semantic representation; 3) syntactic component, where transformations (or other rules which have the same effect) arrange major syntactic categories (noun phrases, verbs, adjectives, and adverbs) in the linear order in which they appear in actual sentences and introduce some of the minor categories (prepositions, auxiliaries); 4) lexical component inserting lexical items from the dictionary where lexical items are defined in terms of syntactic frames of grammatical categories; 5) post-lexical component, where "cosmetic" transformations arrange minor syntactic categories in the linear order in which they appear in actual sentences and erase role labels, indices, and brackets.

4.3. The input structure is representable in terms of graphs or more specifically oriented networks whose knots correspond to various semantic roles such as Agent (Causer), Patient, etc., and whose edges represent relations between knots. In the majority of known languages knots are subsequently realized as NP's, while edges are realized as Predicates. There are four simple roles: Agent (Causer), Patient, Resident, and Locus. Each of the four roles is uniquely defined by the position of a knot with which it is associated on the graph.

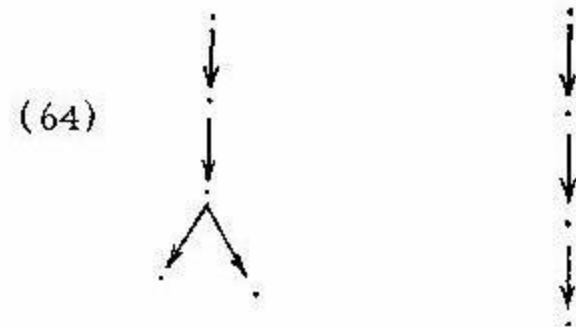
4.4. Each graph which can serve as input to sentence derivation is called a configuration. Each configuration can function as a knot in a matrix configuration. A configuration functioning as a knot is called *subconfiguration*. Those knots of each configuration which take part in further derivation are referentially indexed by integers from 1 to  $n$ . This reflects the fact that those knots which take part in further derivation refer<sub>1</sub> to mental images which in turn refer<sub>2</sub> to things and events in the world at large. In this way configurations of indexed knots constitute analogues of extralinguistic situations with each knot representing an entity which can be associated with one or more linguistic structures. For example there may be a knot  $K_1$  referring<sub>1</sub> to an image of a certain character known to me which in turn refers<sub>2</sub> to a certain man who lived at some time in the past or still lives or else who is only imaginary in which case the relation of reference<sub>2</sub> does not obtain at all. The knot  $K_1$  can be associated with various linguistic structures, e.g. *the man whom I met yesterday*, or *Mr. McClusky*, or *my greatest enemy*.

4.5. The derivation of each sentence starts with the initial configuration in which all roles are present even if not all knots receive referential indices. In other words some knots of a configuration may be referentially empty and are erased as soon as the appropriate role labels have been spelled out in front of each knot or subconfiguration constituting the initial configuration. What remains is a configuration which actually underlies a particular sentence. Such a configuration is called input

<sup>7</sup> Section 4 is an altered version of an unpublished paper "Input to Grammars" read at the First Conference on Polish-English Contrastive Project, Karpacz, December 1970.

configuration. Each initial configuration is structure according to the following general pattern (with two variants);

(64)



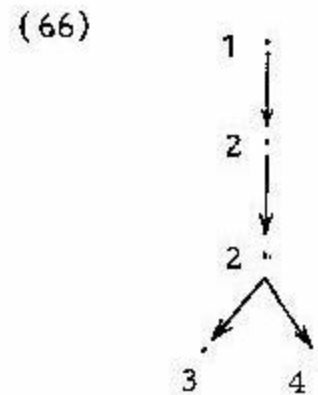
where particular knots are uniquely and permanently associated with the following roles: the uppermost knot — Agentive; the knot below Agentive — Patient; the knot below Patient — Resident; the knot below Resident — either from left to right from Locus and to Locus, respectively, or at Locus (in the second variant).

4.6. A whole configuration may receive a referential index and become a knot in another configuration, occupying the position in accordance with the role it performs. The sentence

(65) The boy killed the cat

involves the following configuration:

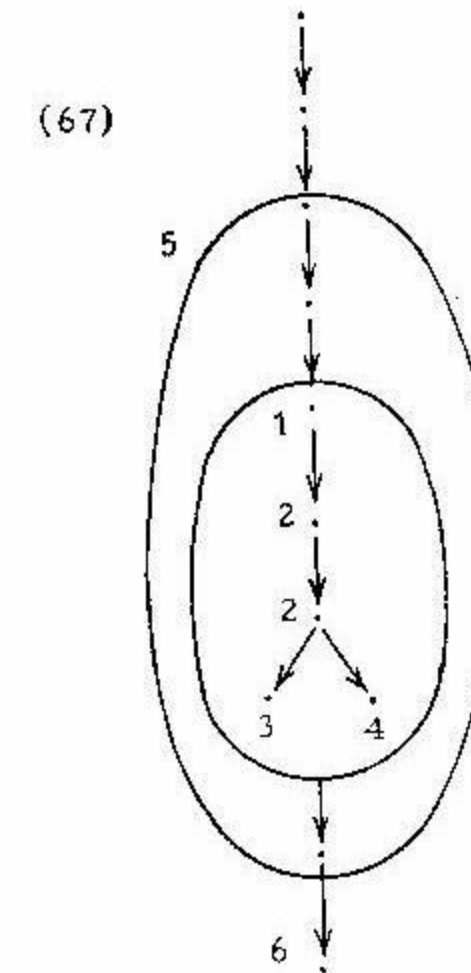
(66)



where 1 — “the boy” (knot 1 refers<sub>1</sub> to the mental image of a boy whose identity has been fixed); 2 — “the cat”; 3 — “living/life”; 4 — “being dead/death”. Since the event of killing the cat occurred in the past, it is necessary to place the configuration which is the analogue of this event

as Resident in Time Locus<sup>8</sup>. In this way the input configuration underlying (65) should look as follows:

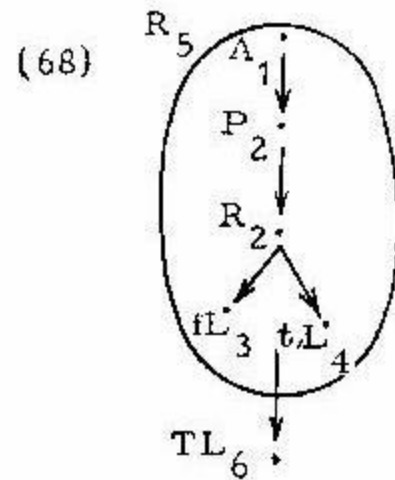
(67)



After the assignment of role labels according to the general pattern of (64) and the erasure of unindexed knots together with the outgoing arrows (67) becomes

<sup>8</sup> All sentences of a natural language must be derived from such complex configurations since all sentences are analogues of events placed in time location. The so-called existential and generic sentences are possible exceptions. In our framework time location is represented as *Time Locus* (TL), i.e. one of the non-innermost Loci of complex configurations. The loci of the initial (innermost) configuration are those of *from Locus* (fL), *to Locus* (tL) and *at Locus* (aL). When the initial configuration is placed as Resident in another configuration its Locus is Manner Locus (ML), if the resulting configuration is in turn Resident in yet another configuration, its Locus is either *Time Locus* or *Place Locus* (depending on whether reference is made to time or to place). According to the general rule of erasing, configurations or their parts which receive no referential index are erased together with the outgoing arrows after the assignment of role labels. Thus, before the application of appropriate rules assigning role labels and erasing non-indexed elements and configurations, the original configuration underlying (65) must look like (67).

(68)



where 5 — "the boy kill the cat"; 6 — "a moment in time preceding the time of speaking".

4.7. Note that fL, tL, and atL can refer as much to spatio-temporal locations as to locations the state of being alive, being dead, being happy, etc. The lexical specification of the knots is given for clarity, although obviously no lexical items are inserted into configurations at this stage of the derivation. It must also be noted that in an overall grammar it might prove necessary to attach different referential indices to every appropriate knot to guarantee the unique association of referential indices with specific mental images (referents<sub>1</sub>). In fragmentary illustrations, such as the present one, we use integers from 1 to n for each input configuration in isolation from all other configurations. Thus each sentence is examined in isolation from all other sentences which could be uttered to refer to the same referents. In this way we manage to employ the whole concept of reference<sub>1</sub> to that extend only which is necessary to explain certain strictly linguistic phenomena without moving into the realms of communicational situation<sup>9</sup>.

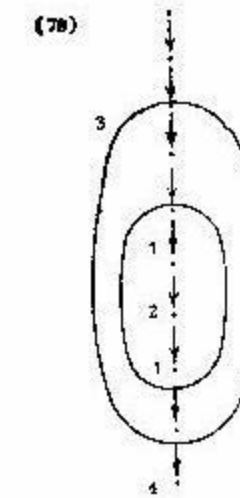
4.8. Sentence (69) and its input structure will provide one more illustration.

(69) John saw the tiger

Its input configuration is

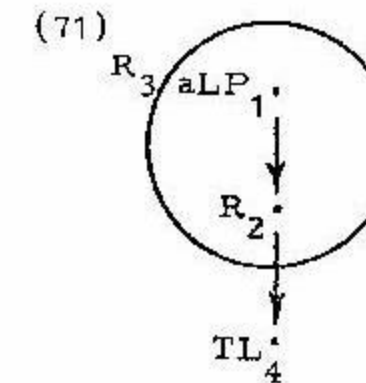
<sup>9</sup> Just how much information concerning reference has to be incorporated into the semantic input and the relevant length of the discourse to be examined will have to be found out empirically. For some discussion of these problems see Krzeszowski (in press).

(70)



where 1 — "John", 2 — "the tiger", 3 — "John see the tiger", 4 — "a moment preceding the time of speaking". After the assignment of role labels and erasure of unindexed knots together with the outgoing arrows we obtain

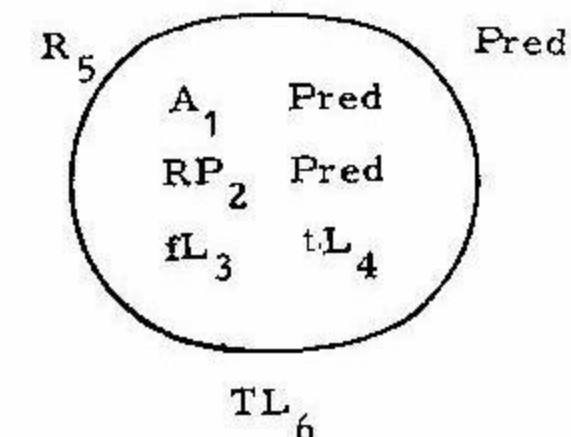
(71)



Observe that the absence of an index from the role A in the subconfiguration reflects the fact that in (69) no Agent is being talked about.

4.9. Apart from the roles, they only universal category in the semantic structure appears to be PRED. It is inserted on the right hand side of all roles except L's (from, to, and at Loci) to replace the dots and arrows of the graphs. Thus (68) becomes

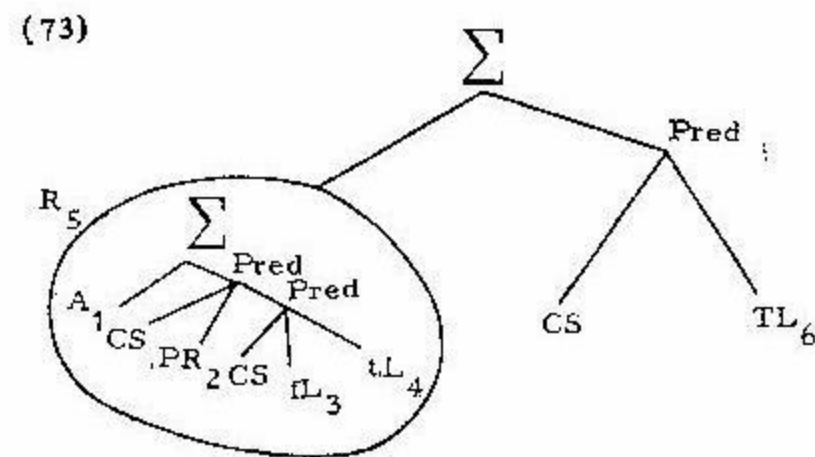
(72)





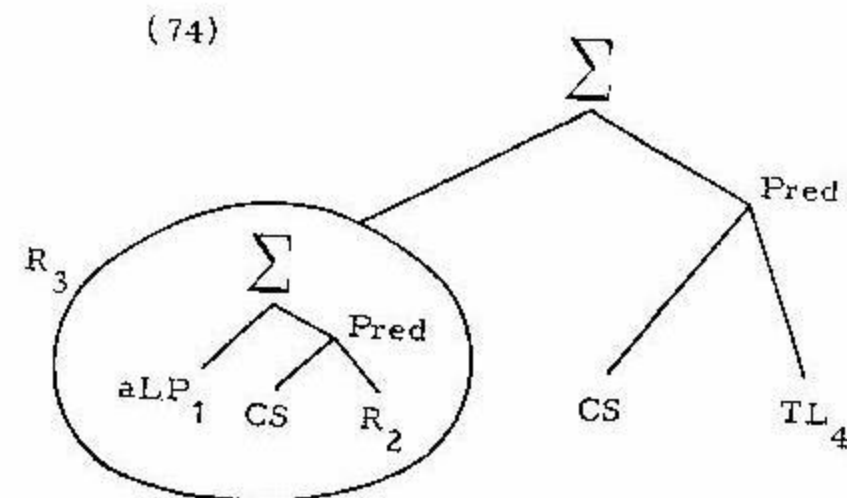
Further universal rules attach each part of each configuration somewhere under the domination of  $\Sigma$  in such a way that the uppermost role is placed under the direct domination of with the PRED associated with a particular role being sister adjoined under the domination of the same  $\Sigma$ . Other roles are placed under the domination of PRED's next above, each PRED dominating a role and its PRED if there is any. The symbol CS (Complex Symbol) is introduced under the domination of each PRED on the left hand side of the role dominated by this PRED. CS's mark the slots in the thus resulting strings where various dictionary entries are inserted to relate roles in meaningful constructions. Thus each configuration can be represented as a tree whose nodes are either roles corresponding to knots or subconfigurations, i.e. encircled configurations with role labels and referential indices attached to them. After the application of the rules, informally described above, (67) becomes

(73)



while (69) becomes

(74)



(73) and (74) can be represented as labelled bracketed strings (75) and (76), respectively, where the material within brackets corresponds to subconfigurations:

(75)  $R_5 (A_1 \text{ CS } R_{P_2} \text{ CS } fL_3 \text{ } tL_4) \text{ CS } TL_6$ (76)  $R_3 (\text{at } LP_1 \text{ CS } R_2) \text{ CS } TL_4$ 

4.10. It goes without saying that labelled bracketed strings are but notational variants of original configurations (such as (67) and (70)) which are uniquely recoverable from the corresponding strings through a handful of metarules mapping configurations onto strings. Thus particular role labels are uniquely associated with the particular positions of knots in the configurations, materials within brackets are associated with subconfigurations (i.e. materials within labelled and indexed circles functioning as knots in configurations), while CS's are introduced in strictly specified places (on the left hand side of each role dominated by PRED). Since labelled bracketed strings are far more convenient to manipulate both on account of their size and their mnemonic values we are using them in our subsequent to represent the input structure of most sentences used as examples.

4.11. Since the categorial component in English assigns the category NP to every role in every derivation (75) becomes

(77)  $RNP_5 (ANP_1 \text{ CS } RPNP_2 \text{ CS } fLNP_3 \text{ } tLNP_4) \text{ CS } TLNP_6$ 

while (76) becomes

(78)  $RNP_3 (\text{at}LPNP_1 \text{ CS } RNP_2) TLNP_4$ 

The syntactic component transforms (76) into

(79)  $RNP_5 (ANP_1 \text{ CS } CS \text{ } RPNP_2) TLNP_6$ 

The lexical component inserts lexical items from the dictionary in such a way that only NP's immediately preceding and following CS's and CS's themselves are replaced with lexical entries. Thus (79) eventually yields

(80)  $RNP_5 (\text{John kill the cat}) \text{ past}$ 

while (78) becomes

(81)  $RNP_3 (\text{John see the cat}) \text{ past}$ 

The "cosmetic" transformations arrange minor syntactic categories in the linear order in which they appear on the surface erase the brackets with their labels and to produce respectively:

(82) John kill past the cat

(83) John see past the cat<sup>10</sup>

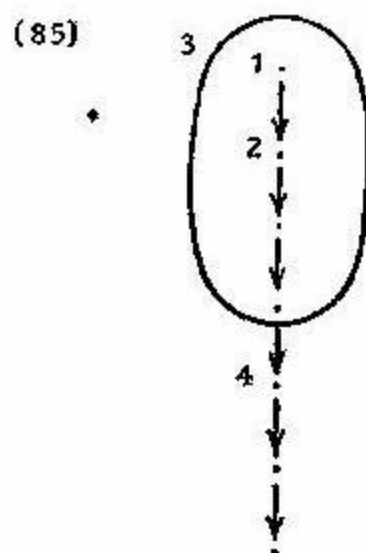
<sup>10</sup> The derivation is naturally greatly simplified as no account is given of such matters as the structure of NP's, noun determination, modality and so on. A more detailed discussion will be presented in a forthcoming work by the present author.

5.1. Sentences with the so-called Instrumentals involve input configurations consisting of A CS P referentially indexed and functioning as A in another configuration of the form A CS P. The P of the subconfiguration is referentially distinct from the P of the matrix configuration. The sentence

(84) John hit Bill with a hammer

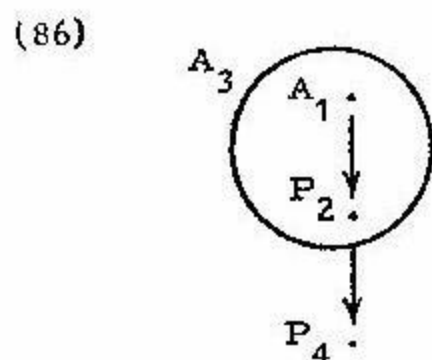
is derived from the following input configurations

(85)<sup>11</sup>



After the application of the rules assigning roles and erasing unindexed elements the following structure is obtained

(86)

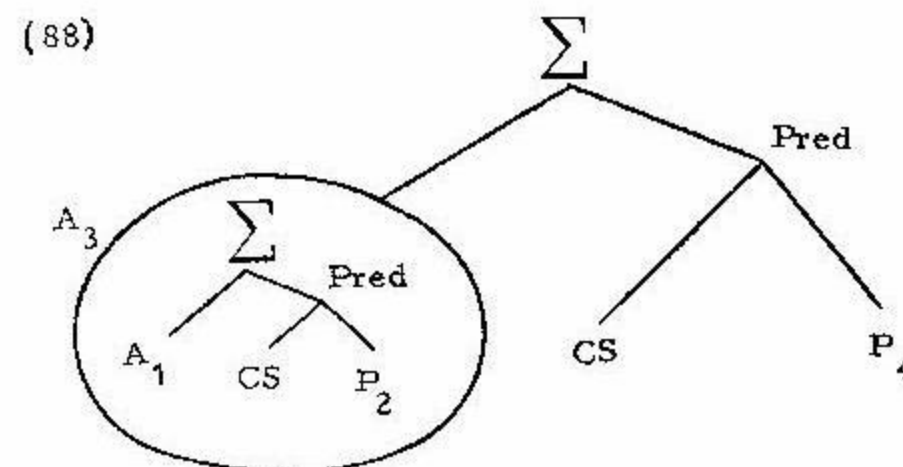


where 1 — "John"; 2 — "a hammer"; 3 — "John use a hammer/John with a hammer"; 4 — "Bill". As a labelled bracketed string (86) can be represented as (87)

(87) A<sub>3</sub> (A<sub>1</sub> CS P<sub>2</sub>) CS P<sub>4</sub>

In terms of diverging trees (86) can be represented as

(88)



After the operation of categorial rules, transformations and lexical insertions (87) becomes

(89) ANP<sub>3</sub> (John V use a hammer) to hit Bill

which through the operation of post-lexical transformations gives

(90) John used a hammer to hit Bill

Through the operation of different categorial rules and lexical insertions (87) can also give

(91) ANP<sub>3</sub> (John Prep with a hammer) hit Bill

The "cosmetic" transformations will eventually yield

(92) John hit Bill with a hammer

In the dictionary use will be characterized as V of replacing CS in ANP CS PNP while *with* will be characterized as a preposition capable of replacing CS in the same context. Observe that *with* can also be inserted in the place of CS in LANP CS RNP as in

(93) The boy with a hammer hit Bill

It is also necessary to distinguish (90) from

(94) John threw a hammer to hit Bill

where *throw* replaces the first (innermost) CS in the following string

(95) RNP<sub>7</sub> (ANP<sub>5</sub> (RNP<sub>3</sub> (ANP<sub>1</sub> CS PNP<sub>2</sub>) TLNP<sub>4</sub>) CS PNP<sub>6</sub>) CS TLNP<sub>8</sub>

where 1 — "John"; 2 — "a hammer"; 3 — "John throw a hammer"; 4 — "a moment preceding TL<sub>8</sub>"; 5 — "John throw a hammer at a moment preceding TL<sub>8</sub>"; 6 — "Bill"; 7 — "John throw a hammer at a time preceding TL<sub>8</sub> and hit Bill"; 8 — "moment following TL<sub>4</sub>". In contrast with (94) the original configuration underlying (90) can be represented in terms of temporal locations as

<sup>11</sup> The specification of time-place location has been omitted from this illustration as irrelevant.

(96)  $RNP_5 (ANP_3 (ANP_1 CS PNP_2) CS PNP_4) CS TLNP_6$

where the event "hitting Bill" is referentially identical with the event "John use a hammer" which is formally represented by placing the two events as Residents in the same temporal location, i.e.  $TL_6$ .

5.2. Summing up, the so-called Instrumental in sentences like (90) and (92) appears to be a derived role, involving two configurations of the type A CS P with one of them functioning as A of the other and both referring to the same event. This fact is formally marked by placing the two events in the same temporal location. The reader will have noticed that in our theory referential identity of roles, and consequently of NP's, is marked by the identity of referential indices attached to those roles which refer to the same referent. On the other hand, the identity of events is formally marked not only by assigning to them the same referential index but also by placing them as Residents in the same temporal location TL.

5.3. The above proposal is in contrast with Chomsky's suggestion (1969) that the original "Seymour sentence", i.e. *Seymour used a knife to slice the salami* must have the following deep structure:

(97) Seymour used a knife [S Seymour sliced the salami with a knife]S

as opposed to *Seymour sliced the salami with a knife*. Chomsky considers it necessary to postulate different deep structures for these two sentences because of the existence of the following sentences:

(98) John carelessly broke the window with a hammer

(99) John carelessly used a hammer to break the window

(100) John used the hammer carelessly to break the window

which according to him differ in the meaning rendering it necessary to differentiate them at the level of deep structure and apparently contradicting Lakoff's claim concerning the identity of deep structures for pairs like *John broke the window with a hammer* and *John used a hammer to break the window*. It is highly dubious whether (98), (99) and (100), if understood agentively to guarantee the instrumental interpretation of the NP *the hammer*, display any such differences in the meaning which would necessitate postulating a completely different semantic structure for each one of them. It seems obvious that "breaking the window" and "using the hammer" refer to the same event. In all three cases the action of breaking the window was performed carelessly. Any other interpretation of (99) or (100), e.g. involving accidental breaking of the window would contradict Lakoff's initial assumption that instrumental adverbs involve purposive action. Within the framework of the present theory

(98) differs from (99) on account of the fact that different parts of the respective original configurations function as Resident NP's in the Manner Locus (ML). Thus (98) is derived from

(101)  $RNP_5 (ANP_3 (ANP_1 CS PNP_2) CS PNP_4) CS MLNP_6$

while (99) originates from

(102)  $ANP_3 (RNP_3 (ANP_1 CS PNP_2) CS MLNP_4) CS PNP_6$

In the conventional spelling but with the original bracketing (101) and (102) can be represented as (103) and (104) respectively:

(103) ((John use a hammer) break the window) carelessly

(104) ((John use a hammer) carelessly) break the window

In view of what has been said earlier I fail to see any difference between (99) and (100). Both express an action consisting of careless using of the hammer and the breaking of the window, the two events being co-referential. Observe that the presented interpretation of Instrumental makes it unnecessary to adopt the unconvincing suggestion made by Chomsky that sentences like *John used a hammer to break the window* somehow entail sentences like *John broke the window with a hammer*, which is implicit in (97).

5.4. Having presented the formal apparatus whereby it is possible to define the semantic nature of the so-called Instrumental constructions, let me now pass on to the demonstration of how this same formal apparatus can be used to account for the divergent nature of the constructions presented in section 3.

5.5 With respect to sentences such as (33), which for convenience we now repeat as

(105) (i) The key opened the door

(ii) The wind opened the door

it was remarked in section 3 that the semantic differences between these sentences have to be grasped at the level of semantic structure in such a way that for (105) (i) an Agent NP has to be postulated. It is subject to deletion by the syntactic component just in those cases when its reference has not been fixed. This is necessitated by the fact that (105) (i) can be paraphrased as (106)

(106) Somebody opened the door with the key

(105) cannot be analogously paraphrased. Therefore, I suggest that (107) and (108) are the appropriate semantic structures underlying (105) (i) and (105) (ii), respectively:

(107) ANP<sub>2</sub> (ANP<sub>1</sub> CS PNP<sub>2</sub>) CS RPNP<sub>4</sub> CS fLNP<sub>3</sub> tLNP<sub>6</sub>

where 1 — "somebody whose reference has not been fixed"; 2 — "the key"; 3 — "somebody use they key"; 4 — "the door" (4 is a complex role implying that "the door" is both Patient and Resident in so far as its changes its Locus from the state of being shut to the state of being open); 5 — "being shut"; 6 — "being open".

(108) ANP<sub>1</sub> CS RPNP<sub>2</sub> CS fLNP<sub>3</sub> tLNP<sub>4</sub>

where 1 — "the wind"; 2 — "the door" (2 is a complex role, cf. (107)); 3 — "being shut"; 4 — "being open". Thus (105) (i) differs from (105) (ii) in that only the former involves two Agentive configurations one embedded into the other to constitute the semantic contents of what is called Instrumental. The derivation of (105) (ii) involves only one Agentive configuration, the same one which underlies sentences such as

(109) John opened the door

5.6. The sentences in (34), now repeated as

- (110) (i) John (accidentally) frightened Mary  
 (ii) The key frightened Mary  
 (iii) The portrait amazed Mary

are all derived from complex configurations containing only one Agent rather than two. The innermost configuration involves only Patient. Nevertheless it functions as Agent in the configuration into which it is inserted. This semantic structure is syntactically justified by the possibility of associating the sentences of (110) with corresponding passive sentences, very much like in the case of sentences containing instrumental adverbs derived from two-Agent configurations. Thus the configuration underlying the sentences of (110) can be represented as

(111) ANP<sub>2</sub> (PNP<sub>1</sub> CS) CS PNP<sub>3</sub>

where 1 — "John" / "the key" / "the portrait"; 2 — "something happen to John / the key / the portrait"; — 3 "Mary".

5.7. The sentences in (35) are only superficially different from the sentences in (34) which was commented upon in section 3. All these sentences have the same input configuration i.e. (111) and are related to (45), (46), (47), and (48), respectively. Like in the sentences of (35) and unlike in the sentences of (33) in none of the sentences of (35) is the Agent of the innermost configuration either expressed or implied.

5.8. The sentences of (36), now repeated as

- (112) (i) Peter filled the glass with water  
 (ii) Mary covered the table with cloth

are different from other sentences with instrumentals in that they cannot have as their subjects PNP's from the innermost configurations. As a consequence of this restriction sentences like (53) and (54), now repeated as:

- (113) Water filled the glass  
 (114) The cloth covered the table

can only be interpreted locatively and never instrumentally in contrast with the seemingly identical sentences like (105) (i) (The key opened the door). This restriction is best stated in the dictionary where verbs like *fill* and *cover* will be defined in terms of role frames into which they can be inserted to replace CS's:

$$\text{cover, fill} \quad \cdot \text{V} \quad \left[ \begin{array}{l} \text{ANP CS LNP CS PNP} \\ \text{RNP CS LNP} \end{array} \right]$$

Such a formulation makes it superfluous to postulate the feature [ $\pm$ Action] upon verbs. The insertion of verbs like *cover* and *fill* into the role frames RNP CS LNP results in sentences where no Agent and consequently no action is involved. The "static" meaning of sentences like (113) and (114) in contrast with the "active" meaning of the sentences of (112) is thus accounted for. The "instrumental" reading of the sentences in (112) naturally involves the same original configuration as in the case of other "instrumental" sentences i.e. (87).

5.9. For sentences like (37), discussed at length in section 3 and repeated here as

- (115) (i) He used the telephone to annoy his teacher  
 (ii) He annoyed his teacher with the telephone

the following configuration is suggested:

(116) RNP<sub>7</sub> (ANP<sub>5</sub> (RNP<sub>3</sub> (ANP<sub>1</sub> CS PNP<sub>2</sub>) CS TLNP<sub>4</sub>) CS PNP<sub>6</sub>) CS TLNP<sub>8</sub>

to reflect the fact that the events referred to by the two Agentive configurations are not necessarily co-referential. In (116) 1 — "he"; 2 — "the telephone"; 3 — "he use the telephone"; 4 — "a moment of time preceding TL<sub>8</sub>"; 5 — "He use the telephone at a moment of time preceding TL<sub>8</sub>"; 6 — "the teacher"; 7 — "He use the telephone at a moment of time preceding TL<sub>8</sub> and annoy his teacher"; 8 — "a moment of time following TL<sub>3</sub>".

5.10. As was said in section 3 the sentences of (38), now repeated as

- (117) (i) He summoned Phil with a jerk of the chin  
 (ii) He answered them with a little bang of one fist upon another

are ambiguous between being interpretable as containing Adverbials of Accompanying Circumstance and Instrumental Adverbials. Admittedly, they are similar to sentences in (37) in so far as *use* is not the only type of verb which can be inserted to replace the CS of the innermost Agentive configuration. On the other hand, both events expressed by the respective parts of

- (118) (i) He jerked the chin to summon Phil  
 (ii) He banged one fist upon the other to answer them

are co-referential which makes these sentences resemble other instrumentals. At the present moment I am unable to suggest an input configuration for such sentences to accommodate these facts. I can only venture the supposition that they, too, must involve two Agentive configurations which are embedded one into the other and which are co-referential.

#### REFERENCES

- Bach, Emmon and Harms, Robert T. 1968. *Universals in linguistic theory*. New York: Holt, Rinehart and Winston Inc.
- Chomsky, Noam. 1969. "Deep structure, surface structure and semantic interpretation". In L. Jakobovits and D. Steinberg, eds. *Semantics: an interdisciplinary reader*. Urbana, Illinois: University of Illinois Press.
- Fillmore, Charles. 1968. "The case for case". In Bach and Harms, 1 - 88.
- Huddleston, Rodney. 1969. *Some remarks on Fillmore's cases*. Preliminary Draft. University College London.
- Krzeszowski, Tomasz P. 1971. "Equivalence, congruence and deep structure". In *Papers in contrastive linguistics*, Ed. G. Nickel. Cambridge: Cambridge University Press.
- Krzeszowski, Tomasz P. (in press). "The relevance of reference in contrastive generative grammar".
- Lakoff, George. 1968. "Instrumental adverbs and the concept of deep structure". *Foundations of language* 4. 4 - 29.
- Lyons, John. 1968. *Introduction to theoretical linguistics*. Cambridge: Cambridge University Press.
- Langendoen, Terence D. 1970. *Essentials of English grammar*. New York: Holt, Rinehart and Winston, Inc.
- Stockwell, Robert P., Schachter, Paul, Partee Hall, Barbara. 1968. *Integration of transformational theories on English syntax*. Los Angeles: University of California, Los Angeles, Vols. I+II.