

- (104) (i) the boy studying in the library was known (by John)
 (ii) the boy studying in the library was found (by John)
 (iii) the boy was found studying in the library (by John)
 (105) the boy was known studying in the library (by John)

The passive transformation applies only to sentences of the form $NP - Verb - NP$. Hence, to yield (104ii), (103ii) must be analyzable as

- (106) John — found — the boy studying in the library,

with the noun phrase object “the boy studying in the library,” (103i) will have a corresponding analysis, since we have the passive (104i).

But (103ii) also has the passive (104iii). From this we learn that (103ii) is a case of the verb + complement construction studied in § 7.4; i.e., that it is derived by the transformation T_{sep}^{ob} from the underlying string

- (107) John — found studying in the library — the boy,

with the verb “found” and the complement “studying in the library.” The passive transformation will convert (107) into (104iii), just as it converts (90) into (89). (103i), however, is not a transform of the string “John — knew studying in the library — the boy” (the same form as (107)), since (105) is not a grammatical sentence.

By studying the grammatical passives, then, we determine that “John found the boy studying in the library” (= (103ii)) is analyzable ambiguously as either $NP - Verb - NP$, with the object “the boy studying in the library,” or as $NP - Aux + V - NP - Comp$, a transform of the string (107) which has the complex *Verb* “found studying in the library.” “John knew the boy studying in the library” (= (103i)), however, has only the first of these analyses. The resulting description of (103) seems quite in accord with intuition.

As another example of a similar type, consider the sentence

- (108) John came home.

Although “John” and “home” are *NP*'s, and “came” is a *Verb*, investigation of the effect of transformations on (108) shows that it cannot be analyzed as a case of $NP - Verb - NP$. We cannot have “home was come by John” under the passive transformation, or “what did John come” under the question transformation T_w . We must therefore analyze (108) in some other way (if we are not to complicate unduly the description of these transformations), perhaps as $NP - Verb - Adverb$. Apart from such considerations as these, there do not appear to be very strong reasons for denying to (108) the completely counterintuitive analysis $NP - Verb - NP$, with “home” the object of “came”.

I think it is fair to say that a significant number of the basic criteria for determining constituent structure are actually transformational. The general principle is this: if we have a transformation that simplifies the grammar and leads from sentences to sentences in a large number of cases (i.e., a transformation under which the set of grammatical sentences is very nearly closed), then we attempt to assign constituent structure to sentences in such a way that this transformation always leads to grammatical sentences, thus simplifying the grammar even further.

The reader will perhaps have noted a certain circularity or even apparent inconsistency in our approach. We define such transformations as the passive in terms of particular phrase structure analyses, and we then consider the behavior of sentences under these transformations in determining how to assign phrase structure to these sentences. In § 7.5 we used the fact that “John was drunk by midnight” (= (102)) does not have a corresponding ‘active’ as an argument against setting up a passive-to-active transformation. In § 7.6 we have used the fact that “John came home” (= (108)) does not have a passive as an argument against assigning to it the constituent structure $NP - Verb - NP$. However, if the argument is traced carefully in each case it will be clear that there is no circularity or inconsistency. In each case our sole concern has been to decrease the complexity of the grammar, and we have tried to show that the proposed analysis is clearly simpler than the rejected alternatives. In some cases the grammar becomes simpler if we reject a certain