Do from Occur*

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I. The verbs *break* and *begin* have surface transitive and intransitive uses.

(1) transitive: Harry broke John's leg
intransitive: John's leg broke
transitive: John began to work
intransitive: The faucet's dripping began

It has been shown by Fillmore and Perlmutter that these two verbs (and the classes of verbs they represent) also have underlying transitive and intransitive uses, but that deep structure intransitive may become transitive in surface structure. Diagrammatically:

\[
\begin{array}{c}
\text{(2) underlying: } & \text{transitive} & \text{intransitive} \\
\text{surface: } & \text{transitive} & \text{intransitive} \\
\end{array}
\]

I will show that *occur* is like *break* and *begin* in this respect with, however, two complications. *Occur* can be deleted, and its surface transitive form is *do*.

First, to provide a framework for the discussion of *occur*, a brief restatement of the analyses of *break* and *begin* is in order. Assume that there is a phrase structure rule which expands S into a verb plus a number of noun phrases (S→V NP*). A corollary of this assumption is that there is a "subject formation rule." I will use the following version:

\[
\begin{array}{c}
\text{(3) Subject formation:} \\
\frac{S', \text{NP}}{\text{1 2}} \\
2 \text{ ch 1 } \emptyset \text{ where 2 ch 1 means Chomsky-adjoin 2 at the left of 1.}
\end{array}
\]
as a variable (which may include brackets) on either side of the structural description and change are understood. The bracket $\sim$ represents the $S$ node to which the NP is Chomsky-adjoined.

2. **Break**

As an example take the derivation of *Harry broke John's leg*. The deep structure (DS) is (4); subject formation applies to (4) to give the surface structure (5).

(4) exemplifies the underlying transitive use of *break*, (5) exemplifies the surface transitive use. (In these terms "transitive" obviously doesn't mean quite the same thing as applied to deep and surface structure.) We get the deep and surface intransitive uses of *break* in *John's leg broke*.

The sentence *John broke his leg* shows the crossover from underlying intransitive to surface transitive. *John broke his leg* has two senses, agentive and non-agentive. In the agentive sense, John was responsible for his leg's getting broken; in the non-agentive sense it was something that just happened to John. In the agentive
sense then, John broke his leg is understood the same way as Harry broke John's leg, except for the identity of the leg-breaker. In the non-agentive sense, John broke his leg is a paraphrase of John's leg broke. These facts are adequately accounted for if we give John broke his leg the two different DS's (8), DS transitive, and (9), DS intransitive, corresponding to the agentive and non-agentive senses, respectively.

(8)

\[
S \\
\downarrow \text{V} \\
\text{NP} \quad \text{NP} \\
\text{break} \quad \text{John} \quad \text{John's leg}
\]

(9)

\[
S \\
\downarrow \text{V} \\
\text{NP} \\
\text{break} \quad \text{John's leg}
\]

DS's (8) and (9) result in the same surface structure, namely (10)

(10)

\[
S \\
\downarrow \text{NP} \\
\text{NP} \\
\text{John} \quad \text{V} \quad \text{NP} \\
\text{break} \quad \text{John's leg}
\]

Subject-formation changes (8) to (10). An additional rule, genitive-raising, is required to convert (9) to (10).

(11) Genitive-raising:

\[
V, \left[ NP, NP, 's \right] \rightarrow \\
1 \quad 2 \quad 3 \quad 4 \\
1 + 3 \quad 2 \quad 3 \quad 4
\]

Genitive-raising changes (9) to a derived structure identical with the DS (8). The derivations of (8) and (9) are then merged, and subject-formation gives (10) for both.
3. **Begin**

Begin works similarly. As was shown by Perlmutter (1968), begin occurs as both an underlying transitive and an underlying intransitive, and the underlying intransitive may become a surface transitive. Again, the underlying transitive is agentive, the underlying intransitive non-agentive. The non-agentive interpretation is the only possible one if the surface subject is inanimate.

(12) The faucet began to drip (=The faucet's dripping began)

(13) It began to rain

On the other hand, (14) is agentive, while (15) is ambiguously agentive or non-agentive.

(14) John carefully began to unscrew the faucet.

(15) John began to lapse into the vernacular.

The details of the derivations of agentive and non-agentive begin are then as follows. As an example of the agentive, deep structure transitive begin take the sentence (16), whose DS is (17).

(16) John began to work.

(17) `The NP over S which is the object complement of begin does not undergo pronominalization, no matter whether begin is agentive or non-agentive. There are marginal sentences like John began to work, and he began it right away, but this from John began to work, and he began to do it right away with to do
deleted. That is, the it (in other instances the job, the task) shows the presence of a NP, but the NP is a complement of do, not begin.

\[ (18) \]

\[
\begin{array}{c}
\text{NP} \\
\text{begin} \\
\text{NP} \\
\text{S} \\
\end{array}
\]

\[
\begin{array}{c}
\text{John} \\
\text{begin} \\
\text{John} \\
\text{work} \\
\end{array}
\]

\( (18) \) is converted to John began to work by familiar rules--complementizer placement and identity erasure.\(^5\)

\(^5\)Rosenbaum (1967).

As an example of the non-agentive, underlying intransitive begin take (19), with the DS (20).

\( (19) \) The faucet began to drip.

(20)

\[
\begin{array}{c}
\text{V} \\
\text{begin} \\
\text{drip} \\
\end{array}
\]

\[
\begin{array}{c}
\text{NP} \\
\text{the faucet} \\
\end{array}
\]

Subject-formation applies to the lower S in (20) to give (21).
Subject-formation can then apply to the higher S, resulting in

The faucet's dripping began. However, to get (19), we need a
new rule, subject-raising.

(22) Subject-raising:
\[
V, [ [ [[NP \quad NP \quad S \quad 1 \quad 2 \quad 3 \\
1 + 3 \quad 2 \quad 3 ] ] ] \]

Subject-raising converts (21) to (23), which by subject-formation
becomes (24).

(23) 

(24) 

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As with break, intransitive begin can become transitive by having its single NP complement become two sister NP's. This treatment accounts for a set of paraphrases (25) and a set of ambiguities (26).

(25) John's leg broke.
     = John broke his leg.
     The faucet's dripping began.
     = The faucet began to drip.

(26) John broke his leg.
     John began to lapse into the vernacular.

Since genitive-raising and subject-raising are copying transformations, we predict that in non-agentive interpretations the subject of transitive break will be the same as the genitive modifying break's object and that the subject of transitive begin will be the same as the subject of its object complement. Of course, this is the case. This result doesn't seem to be a real economy in the case of begin, since transitive begin obeys this restriction whether it is agentive or non-agentive. In the agentive case, however, this restriction is an accidental fact about begin, as can be seen by considering the verb start, which does not obey the like-subject restriction in the agentive but is otherwise the same as begin.

4. Occur

There is another kind of sentence which displays the agentive/non-agentive ambiguity. For example, in (27) John's action could have been deliberate or not.

(27) John collapsed.

Since here we have the same ambiguity as was encountered in the sentences with break and begin, it should be treated the same way. What came out to be the surface subject in the agentive sense of the break/begin sentences was an element of the main sentences in DS. In the non-agentive sense however, the surface subject was not an element of the main sentence in DS, but was
copied up into the main sentence from lower in the tree. The same should be true of sentence (27). In (27), however, there seems to be no "lower construction". I propose that the verb occur is present in the two DS's corresponding to (27), and that the ambiguity of (27) can be accounted for the same way as the ambiguity of the begin sentences, with occur replacing begin. So the two DS's of (27) are (28) and (29).

(28) agentive:

```
(28) agentive:
S
  V  NP  NP
     |    |
    occur John
      V  NP
          S
              V  NP
                  collapse John
```

(29) non-agentive:

```
(29) non-agentive:
S
  V  NP
     |    |
    occur S  NP
          V
              NP
                  collapse John
```

(28) and (29) are converted to surface structures just like the sentences with begin. Later occur is deleted. For example, the steps in the derivation of John collapsed in the non-agentive sense are the following:
(29) - (30)
subject formation

(31)
subject raising

(32)
subject formation

(33)
deletion of occur
(occur - ∅ / _NP)
As with begin, subject-raising need not apply, and (30) can become (34) by subject-formation.

(34) John's collapsing occurred.

So it is predicted that (34) is a paraphrase of John collapsed only in (34)'s non-agentive sense. This seems to me to be correct, although (34) is so awkward that it is hard to tell.

To show that occur is in fact present in the DS of John collapsed, consider the sentence frame S, and I'm sorry that S.

The two S's must be the same, as is shown by (35)-(38).

(35) John collapsed, and I'm sorry that he collapsed.
(36) *John collapses, and I'm sorry that Harry collapsed.
(37) *John collapsed, and I'm sorry that he picked the flower.

In (35) the he represents John, so on the underlying level, the S's are the same. But note (38).

(38) John collapsed, and I'm sorry that it occurred.

The it must represent the sentence John collapsed (dominated by an NP). For the S's to be the same, the first conjunct must contain occur, which has been deleted.

Note also that an agentive interpretation is possibly only with a non-stative\(^7\) main verb, hence the agentive/non-agentive

\(^7\)Lakoff (1966a).
ambiguity only arises with non-stative verbs. Since a deletable occur is postulated to account for this ambiguity, it is a happy coincidence that occur requires a non-stative verb in its complement.

(39) *John's being tall occurred

Now let us consider the evidence for saying that the transitive form of occur is do. Note (a) that (32) is interpretable if there is a rule (40).

(40) occur - do / __ direct object

By (40), (32) becomes (41).

(41) John did his collapsing

(b) Do has the same restriction with respect to its object complement as occur has with its subject complement; the main verb of the complement must be non-stative. If do is the transitive form of occur, the restriction need only be stated for occur.

(c) Both do and occur can be deleted without any change in meaning. In addition to (35) above, we have (42).

(42) John collapsed, and I'm sorry that he did it.

Do has been deleted from the first conjunct. The deletion of

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3Lakoff and Ross (1966), Ross (1967).
do and occur can be expressed as one rule; if it takes place after \((40)\), the rule is \((43)\):

\[
(43) \quad \text{do} \rightarrow \emptyset / \_ V
\]

(d) the surface form do occurs in both agentive and non-agentive sentences.

\[(44)\] agentive:
I told John to run, and he tried to do so.

\[(45)\] non-agentive:
It began to rain, and it did so all week.
What it did was (to) rain all week.

To account for this and to account for the appearance of the expletive \(\text{it}\) in \((45)\) we must say that do has a deep structure intransitive form. Unless we are prepared to say that this form is occur, we must guarantee that this DS intransitive becomes transitive, since this do does not occur as a surface intransitive.

(e) The last piece of evidence is that the behavior of do with respect to "outer" locatives is a reflection of the behavior of occur and may be predicted from it. In \((46)\) the locative in the garden is, in DS, a complement of occur.

\[(46)\] John collapsed in the garden.
If the occur had not been deleted, \((46)\) would come out as \((47)\).

\[(47)\] John's collapsing occurred in the garden.
As was noted, the subject complement of occur must have a non-stative main verb. So the unacceptability of \((48)\) implies the unacceptability of \((49)\).

\[(48)\] *John's being tall occurred in the garden
\[(49)\] *John was tall in the garden.
That in the garden is a complement of occur in the DS of \((46)\) is also demonstrated by \((50)\).

\[(50)\] John collapsed in the garden, and I'm sorry that it occurred there.
Of course the it represents a NP dominating the sentence John collapsed and the there represents in the garden. But we also
have (51), where the \textit{it} represents John collapsed in the garden.

(51) John collapsed in the garden, and I'm sorry that it occurred.

Therefore in the DS of (46) both John collapsed and John collapsed in the garden are subjects of occur; therefore there are two occur's. That is, the DS of (46) is (52).

(52)

\[
\begin{array}{c}
\text{S} \\
\text{V} \\
\text{NP} \\
\text{occur} \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
\text{V} \\
\text{NP} \\
\text{occur} \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
\text{V} \\
\text{NP} \\
\text{in the garden} \\
\end{array}
\]

\[
\begin{array}{c}
\text{V} \\
\text{NP} \\
\text{collapse} \\
\text{John} \\
\end{array}
\]

Applying cyclically to (52), subject-formation gives (53), which is an adequate basis for the different pronominalizations in (50, 51).

(53) John's collapsing's occurring in the garden occurred.

\[
\begin{array}{c}
\text{S} \\
\text{NP} \\
\text{S} \\
\text{V} \\
\text{occur} \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
\text{V} \\
\text{NP} \\
in the garden \\
\end{array}
\]

\[
\begin{array}{c}
\text{NP} \\
\text{S} \\
\text{occur} \\
\text{in the garden} \\
\end{array}
\]

\[
\begin{array}{c}
\text{V} \\
\text{NP} \\
collapse \\
\text{John} \\
\end{array}
\]
But now, suppose that subject-raising applies to (52) as well as subject formation. The rule (40) will also apply. The steps in the derivation are given in (54).

(54)

S³ cycle:

subject formation:

\[ \text{S}_1 \rightarrow V \rightarrow \text{NP} \rightarrow \text{S}_2 \rightarrow V \rightarrow \text{NP} \rightarrow \text{NP} \rightarrow \text{in the garden} \]

\[ \text{NP} \rightarrow \text{collapse} \]

\[ \text{NP} \rightarrow \text{John} \]

\[ \text{S}_2 \rightarrow V \rightarrow \text{NP} \rightarrow \text{NP} \rightarrow \text{in the garden} \]

\[ \text{NP} \rightarrow \text{collapse} \]

\[ \text{NP} \rightarrow \text{John} \]

\[ \text{S}_3 \rightarrow V \rightarrow \text{NP} \rightarrow \text{NP} \rightarrow \text{in the garden} \]

\[ \text{NP} \rightarrow \text{collapse} \]

\[ \text{NP} \rightarrow \text{John} \]
$S_2$ cycle:

subject raising:

subject formation:
rule (40):

S₁ cycle:

subject-raising:
subject-formation

rule (40)

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Either do in this last derived structure may show up, provided its object is pronominalized.\(^9\)

\(^9\) Depending on which NP over S is nominalized, the derived structure with two do's results in two distinct intonations:

- John did his collapsing in the garden yesterday.
- John did his collapsing in the garden yesterday.

The rule which pronominalizes the object of do (complement-pronominalization) must follow subject-raising, which is cyclic. So complement-pronominalization must be cyclic, last-cyclic, or a rule that can apply anywhere (an everywhere rule). The sentence John decided to be arrested, and Harry did so too shows that complement-pronominalization follows the passive transformation, which is cyclic. At least it shows this if you believe that identity erasure must precede complement-pronominalization. The sentence John wanted to be arrested, and Harry wanted it too seems to me to be ambiguous. If the it is the result of a pre-cyclic pronominalization, Harry wanted someone to arrest John; if the it is the result of a cyclic or last-cyclic pronominalization, Harry wanted someone to arrest Harry.

In Lakoff (1966b) it is argued that complement-pronominalization (or S-deletion) is an everywhere rule.

\(\text{(55)}\) John collapsed in the garden, and I'm sorry he did it.
John collapsed in the garden, and I'm sorry he did it there.

\(\text{(56)}\) John collapsed in the garden, and Harry did so too.
John collapsed in the garden, and Harry did so in the street.

\(\text{(57)}\) What John did was (to) collapse in the garden.
What John did in the garden was (to) collapse.

It is also predicted that each of the sentences in (55-57) has an agentive and a non-agentive interpretation. The derivation (54) is of the non-agentive sense, but if \text{occur} took an agent, John, subject-raising could not take place. Nevertheless, we would get the same derived structure as in (54). So the DS of the agentive sense of John collapsed in the garden is (58).
Actually, we have predicted two other senses besides these two. The higher *occur* could have an agent and the lower *occur* not have an agent, or the lower *occur* could have an agent, and the higher *occur* not have an agent. It seems that the former sense is impossible, the latter O.K. John could have chosen to collapse but not chosen the garden as the place to do it. On the other hand, it is not conceivable that he should have chosen to do his collapsing in the garden, yet not have chosen to collapse. Thus we need the restriction that, if *occur* takes an agent, any *occur* it commands\(^\text{10}\) must also have an agent.

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\(^\text{10}\)Langacker (1966).

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5. We have seen why, to explain certain ambiguities and paraphrases, in some situations non-stative verbs must be commanded by *occur* in DS. It is only a small step to saying that all non-stative verbs are commanded by *occur*, and that in fact this is how non-stativity is marked. Then we can restrict the taking of an agent to *occur* alone. In fact we can define the notion of agent in the following way: a NP is an agent if in DS it is the first of at least two complements of *occur*, the second being the direct object. (Of course it remains to define "direct object.") I hope that ways along this line can be found to avoid labeling NP's, as is done in Fillmore's case grammar.
References


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