The Structure of English Sentences
K. Hale (1978)

I. Parts of Speech (features):
   (a) $V$, AUX, $N$, $A$, $P$, ...;
   (b) $S$ = AUX (i.e., the structure headed by AUX is symbolized $S$).

II. Phrase Structure:
   (a) $x^3 \rightarrow \text{Spec } x^2 x^2$
       $x^2 \rightarrow \text{Spec } x^1 x^1$
       $x^1 \rightarrow x$ Complements
   (b) $s^4 \rightarrow x^3 s^3$

III. Specifiers:
   (a) Spec$_{32}$:
       (i) that, whether, WH (wh-expressions);
       (ii) delete. (If not, indirect discourse.)
       (iii) $\text{Cor}$.
   (b) Spec$_{31}$:
       (i) WH, $N^3$ (subject);
       (ii) never, only rarely, ...;
       (iii) $Q$ (possibly by interpretation).
   (c) Spec$_{V2}$: $N^3$ (subject);
   Spec$_{V1}$: not, never, ever, ...

IV. The Auxiliaries (AUX):
   (i) tense (n't);
   (ii) the modal auxiliaries (can, could, may, ...): (n't);
   (iii) to (of the to-infinitive);
   (iv) selects $V^3$. 
V. The Aspectual Auxiliary Verbs:

(a) have:

(i) selects \([+V, +\text{perf}, -A]^3\) (active);

(ii) lacks progressive form, thus the ill-formed

*John is having arrived.

(iii) the progressive must be distinguished from the morphologically identical nominalization in \(\text{-ing}\), for the following is well formed,

John's having arrived late ...

(iv) cannot appear as \([-\text{perf}]\) complement of have, thus

*John has had arrived.

*John's having had arrived late ...

(b) be:

(i) selects \([+V, +\text{prog}]^3, [+V, +\text{perf}, +A]^3\) (passive);

(ii) Ross's Double-\text{-\text{ing}} Filter blocks the following:

*John is being studying Turkish.

*John's being studying Turkish surprised everyone.

Compare:

*John is trying studying Turkish.

*John's trying learning Turkish is a joke.

beside well-formed

John tried learning Turkish.

John's trying to learn Turkish is a joke.

(c) Like true verbs, the aspectual auxiliaries appear in to-infinitives (John is believed to have learned Turkish; John is believed to be learning Turkish) and with modal auxiliaries (John may have learned Turkish; John may be learning Turkish). But they also have characteristics which they share with the auxiliaries:

(i) they combine with tense \(\bar{n}'t\);

(ii) they may not be preceded by do\(\bar{\text{-tense}(\bar{n}'t)\).
I will assume tentatively that have and be are verbs, rather than members of the AUX category, and that the two bits of AUX-like behavior are to be accounted for by rule (e) below, a rule similar in its effect to the Have-Be Raising rule of Klima (1966), Emonds (1970), and Jackendoff (1972, 1977). (But see VIII below.)

VI. Rules of Form:

(a) Specifier Fronting-

\[
\text{AUX} - \text{Spec}_1 \Rightarrow 2 \ 1 \ 0
\]

(b) not-Enclisis-

\[
\text{not - AUX} \Rightarrow 0 \ 2 \ # \ 1
\]

(c) do-Support-

\[
\text{AUX}^{\text{tense}} \Rightarrow \text{AUX}^{\text{do + tense}}
\]

(d) Affix Hopping-

\[
\text{tense - V} \Rightarrow 0 \ 2 \ # \ 1
\]

(e) Aspectual Auxiliary Verb Raising-

\[
tense \ (n't) - (N^3) - \{\text{have, be}\} \Rightarrow 3 + 1 \ 2 \ 0
\]

VII. Exemplification:

(1)  

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(\text{Spec}_S^1) \\
 S^2 \\
 / \ \\
\text{AUX} \\
 S^1 \\
 / \ \\
\text{Spec}_V^1 \\
 / \ \\
V^2 \\
 / \ \\
\text{Spec}_V^2 \\
 / \ \\
V^3 \\
 / \ \\
N^3
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(a) John studied Turkish.

(John - past - PRO - \emptyset - study - Turkish)

(b) John never studied Turkish.

(John - past - PRO - never - study - Turkish)

(c) John didn't (ever) study Turkish.

(John - past - PRO -(ever) - study - Turkish)
(d) Did John ever study Turkish?
(Q - past - John - ever - study - Turkish)

(e) Never did John study Turkish.
(never - past - John - Ø - study - Turkish)

(f) Never did John not finish his work.
(never - past - John - not - finish - his work)

(g) What did John ever study?
(what - past - John - ever - study - t)

(h) What does John never eat?
(what - pres - John - never - eat - t)

(i) What doesn't John ever eat?
(what - pres - John - ever - eat)

(j) Who studies Turkish?
(who - pres - PRO - Ø - study - Turkish)

(k) (John tried) to learn Turkish.
((John tried) - PRO - to - PRO - learn - Turkish)

(l) (John tries) not to make mistakes.
((John tries) - PRO - to - PRO - not - make - mistakes)

(m) John can never finish his work.
John never can finish his work.
(John - can - PRO - never - finish - his work)

(2) The progressive: [+V, +prog, +A];
Nominalizations: [+V, +N];
The bare infinitive: [+V, -A, -N] (i.e., V^3 as in IV (iv)).

(a) (I heard John) practicing his Turkish.
((Iheard John) - PRO - Ø - practicing - his Turkish)

(b) (I caught John) not wearing his braces.
((I caught John) - PRO - not - wearing - his braces)
(c) John's never finishing his work (bothers me).
   (John - never - finishing - his work - (bothers me))

(d) (I helped John) finish his work.
   ((I helped John) - PRO - ∅ - finish - his work)

(e) (I helped John) not make a mistake.
   ((I helped John) - PRO - not - make - a mistake)

(3) \(S_3^3\) and \(S_4^4\):

- that-Complements \([+AUX, -N]^3\);
- relative clauses \([+AUX, +N]^4\);
- exclamatory expressions \([+AUX, (+N?)]^4\);
- topicalizations \([+AUX, -N]^4\);
- sentences with 'sentential subjects' \([+AUX, -N]^4\) (with \([+AUX, -N]^3\) in 'topic' position).

(a) (I believe) that John will never learn Turkish.
   ((I believe) that - John - will - PRO - never - learn - Turkish)

(b) the language which John will never learn ... 
   (the language - which - John - will - PRO - never - learn - t)

(c) (I am amazed at) what big eyes gramma has.
   ((I am amazed at) what big eyes - ∅ - gramma - pres - PRO - ∅ - have)

(d) Turkish John will never learn.
   (Turkish - ∅ - John - will - PRO - never - learn - t)

(e) That John learned Turkish surprised everyone.
   (that John learned Turkish - ∅ - PRO - past - PRO - ∅ - surprise - everyone)

VIII. Problems:

(1) *John does never eat fish. (Possible solution, VIA obligatory where Spec is negative and AUX = tense; plus some fixing up of enclisis of not.)
(2) *the man whom does John know ... (Possible solution, Brame's explanation of the Island phenomena (1978))

(3) *the man whom hardly ever does John see ... (Possible solution, Brame's (?))

(4) *Did John try to ever learn Turkish. (Possible solution, opacity, the SSC (Chomsky 1973, etc.))

(5) Too many sources for n't. (Possible solution, all by enclisis; requires OK John said that Bill he likes t, and other things; loses possible explanation of "That that John learned Turkish surprised every one.)

(6) The unseemliness of the Aspectual Auxiliary Verb Raising rule. (Possible solution: have and be are pseudo-AUX (i.e., \(+V, +AUX\)); the tensed forms are in the base, in complementary distribution with the modals. The modals 'select' any \(+V\), while tense 'selects' only true verbs (i.e., \(+V, +AUX\)). This solution involves a complication of the base in place of an unlikely rule of form.)