Assignment 1: English Auxiliary Verbs

The purpose of this write-up is to argue that the class of words in English known as auxiliaries (*might*, *will*, *has*, *is*, etc.) are verbs that select VPs as complements. I show how such an account correctly predicts the external distribution of phrases containing auxiliaries, and how it allows for various restrictions associated with auxiliaries (relating to linear ordering and verb morphology) to follow from the SEL values of the auxiliaries in the lexicon.

In the first section, I argue that phrases containing auxiliary verbs are VPs. In the second section, I argue that auxiliaries are verbs and that they select for VPs, and I draw on linear ordering data and morphological form data to sketch lexical entries for each relevant type of auxiliary showing what kinds of VPs they can combine with. This section ends with an example sentence and tree that show how the analysis works. Finally, in the third section, I present VP-deletion data and discuss how the nature of VP-deletion provides further support for this analysis of auxiliaries.

1   External syntax

Before even considering the internal syntax of phrases that begin with one or more auxiliaries, it is clear that such phrases have the external distribution of VP. In class we considered sentences such as:

(1)   a. We [depend on foreign oil].

    b. He [devoured potatoes].

    c. She [put money on the table].

where a VP (bracketed in the examples above) combines with some NP subject to form a complete sentence. Similarly, in each of the examples below (repeated from (1) on the assignment sheet), a phrase beginning with one or more auxiliaries combines with an NP subject and forms a sentence:

(2)   a. Sheila [*might* reconsider].

    b. Your coffee grinder [*will* last longer if you follow these simple instructions].

    c. David [*has* hit another home run].

    d. Somebody [*is* sleeping in my bed].

    e. No intelligent person [*could have* made such an outrageous statement].

    f. His behavior over the past year [*has been* puzzling me].

That the bracketed portions above do indeed constitute phrases is supported by their ability to be coordinated, e.g.:

(3)   David [*has* hit another home run] and [*is* sleeping in my bed].

Having established that phrases beginning with auxiliaries constitute VPs, the rest of this write-up will be concerned with the internal syntax of such phrases.

2   Internal syntax

2.1   Selection and the syntactic category of auxiliaries

Our current version of "merge" states that given two syntactic objects A and B such that A selects B, we can form C such that:

- C immediately dominates A and B.

- The features of C equal the features of A minus the SEL features of B.

The way this rule is stated, two objects can combine only if one selects for the other via its SEL value. Furthermore, SEL values must originate in lexical entries; there is currently no other way for them to come about. Therefore, in sentences such as those in (2) above, either the auxiliary selects for the verb following it (which in turns selects for its own complements, if any), or the verb selects for the auxiliary (in addition to any of its other complements).

One way to get at which element is selecting and which is being selected is to check which element determines the phrase's external distribution, since "merge" requires that the selecting element also share some of its features with its mother. In the following examples, the auxiliary determines the external distribution of the bracketed VP, suggesting that it is the auxiliary that does the selecting:

(4)   a.   We [are going to the store].

       b. *We [am going to the store].

       c. *I [are going to the store].

       d.   I [am going to the store].

As these sentences show, "are going to the store" and "am going to the store" have different distributions. Altering the auxiliary affects the distribution even when the (other) verb is left alone.

One might counter that altering the verb "going" can also affect grammaticality:

(5)   a.   We [are going to the store].

       b. *We [are go to the store].

       c. *I [are going to the store].

       d. *I [are go to the store].

The crucial difference here, however, is in (5b): the phrase "are go to the store" is *never* grammatical regardless of what it combines with; this is an internal constraint rather than an external one, and will be discussed in more detail below.

Finally, since the auxiliary does the selecting, it follows from "merge" that it is also the head (i.e., it determines the features of its mother). As seen in the last section, the mother of a phrase beginning with an auxiliary is a VP; therefore, auxiliaries are verbs. Now we can examine their selectional restrictions in more detail.

2.2 Restrictions on selection

2.2.1 Linear ordering

The following data, taken from (3) on the assignment sheet, demonstrate restrictions on the ordering of auxiliaries:

(6)　a. *Nigel may should play the zither.

　　　b.　Nigel may have played the zither.

　　　c.　Nigel may be playing the zither.

　　　d. *Nigel has may(en) play the zither.

　　　e.　Nigel has been playing the zither.

　　　f. *Nigel is may(ing) play the zither.

　　　g. *Nigel is having played the zither.

All of these examples obey the following ordering constraint (where HAVE stands for *have* and its other morphological forms, BE stands for *be* and its other morphological forms, and MODAL stands for *may*, *should*, and all the other auxiliaries under discussion):

$$MODAL < HAVE < BE$$

Furthermore, (6a) shows that modals cannot combine with other modals. HAVE and BE also do not combine with their own kind:

(7)　a. *Nigel had had played the zither.

　　　b. *Nigel is being playing the zither.

Both the ordering constraint and the restriction on selection of like types are captured by the following generalizations (without yet dealing with restrictions in morphological form):

Auxiliary type	Possible complement types
MODAL:	HAVE, BE, non-auxiliary verb
HAVE:	BE, non-auxiliary verb
BE:	non-auxiliary verb

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This chart says that modals can select for HAVE, BE, or a non-auxiliary verb; HAVE can select for BE or a non-auxiliary verb, and BE can select only for a non-auxiliary verb. Keeping these constraints in mind, we now turn to restrictions on the morphological forms of auxiliaries and the verbs they select for.

2.2.2 Morphological form

Modal auxiliaries select only BARE-form[1] verbs:

(8)   a. I may be happy.

   b. *I may is/am/are/was/were/being/been be happy.

(9)   a. I can play the zither.

   b. *I can plays/played/playing the zither.

   Modals are also peculiar in not having bare forms themselves, unlike HAVE and BE. This can be seen by trying to put a modal after infinitival *to*, where only a bare form is possible:

(10)   a. *You need to may/can/will do this.

   b. You need to have done this.

   c. You need to be doing this.

Thus we might say that the reason modals cannot combine with each other, as seen in (6a) above, is because modals select only BARE-form verbs, and modals have no bare form.

   Let us introduce a new feature, FORM, for lexical entries of verbs, which takes as its value PRES-SG, PRES-PL, PAST, BARE, -ING or -EN depending on the morphological form of the verb. Now we can sketch a lexical entry for modals:

$$\text{MODAL:} \begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{PRES-SG/PRES-PL/PAST} \\ \text{SEL} & \begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{BARE} \end{bmatrix} \end{bmatrix}$$

This lexical entry template[2] says that modals are verbs, and they select for syntactic objects that are also of the category verb and that have bare form. Ultimately, we will probably want to have a more general FORM value for modals that subsumes all finite forms, but the important point is that modals are necessarily finite and do not have bare forms, and thus cannot combine with each other by virtue of their own SEL requirements. The lexical entry captures all the relevant facts about

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[1]This discussion assumes the terminology on the assignment sheet for naming the different verb forms.

[2]Naturally, each modal verb needs its own entry in the lexicon, but since all the relevant features are the same, I present just one general template.

modals. Its SEL value will ensure that it can select for non-auxiliary verbs (in bare form), HAVE (in bare form *have*), and BE (in bare form *be*), but that it cannot select for other modals.

We turn now to HAVE. HAVE selects only -EN-form verbs:

(11)   a. I have sung this song.

      b. *I have sings/sing/sang/singing this song.

(12)   a. He had eaten lunch.

      b. *He had eats/eat/ate/eating lunch.

We might also argue that HAVE does not have an -EN form, since auxiliary *had* cannot appear in any place where an -EN form would be possible, as already seen in (7a) above. The following lexical entry template captures the relevant facts about HAVE:

$$
\text{HAVE:} \begin{bmatrix} \text{CAT} & \text{V} \\ \\ \text{SEL} & \begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{-EN} \end{bmatrix} \end{bmatrix}
$$

Of course, in the actual lexicon, there will be one entry for each morphological form of HAVE (*has*, *have*, *having*). The lack of an entry for an -EN form will prevent HAVE from selecting for itself.

Finally, BE selects only -ING-form verbs:

(13)   a. I am playing the zither.

      b. *I am plays/play/played the zither.

(14)   a. She was eating dinner.

      b. *She was eats/eat/ate/eaten dinner.

Our entry template for BE will thus be as follows:

$$
\text{BE:} \begin{bmatrix} \text{CAT} & \text{V} \\ \\ \text{SEL} & \begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{-ING} \end{bmatrix} \end{bmatrix}
$$

As with HAVE, there will be one lexical entry for each morphological form of BE (*is*, *am*, *are*, *was*, *were*, *be*, *been*). We can prevent BE from selecting its own type to prevent sentences like (7b) above the same way we did for MODAL and HAVE, by not having a lexical entry for *being*. There is the problem that BE does have an -ING form, although never when selecting for a VP:
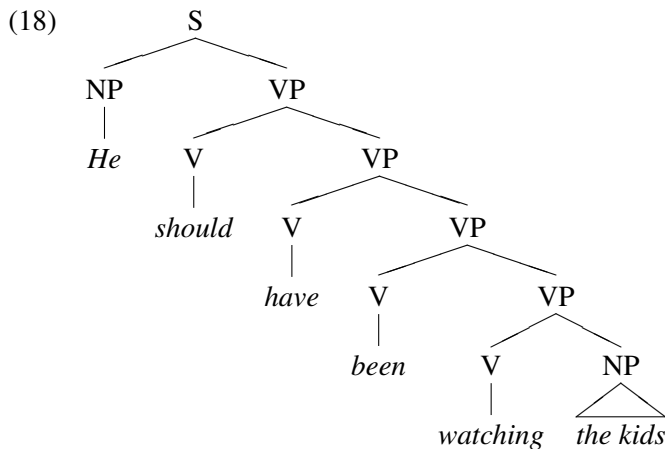
(15)   He is being a dictator.

(16)   He is being dictatorial.

(17) *He is being dictating.

For now we might hypothesize that there is another set of lexical entries for the version of BE that selects for adjectival/nominal complements, and it is this set that contains an entry for *being*.

2.3 An example sentence

An example tree will serve to illustrate how the posited lexical entries interact with "merge" to generate sentences that string together up to three auxiliaries:

(18)
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                    S
          ┌─────────┴─────────┐
         NP                   VP
          │            ┌───────┴────────┐
         He            V                VP
                       │          ┌──────┴──────┐
                     should       V             VP
                                  │        ┌─────┴─────┐
                                have       V           VP
                                           │      ┌─────┴─────┐
                                         been     V           NP
                                                  │          ╱△╲
                                              watching     the kids
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In (18) (working from the bottom up for expository convenience), the verb *watching* selects for NP *the kids*. Since *watching* has -ING form and it is the head of its immediate phrase, *watching the kids* is also -ING form and thus available for selection by *been*. The VP *been watching the kids*, in turn, is -EN form, as determined by its head, *been*. The phrase is selected by *have* to form *have been watching the kids*, which, by virtue of its head, is BARE-form. Finally, *should*, which selects BARE-form VPs, combines with it to form *should have been watching the kids*, which is then available to combine with an NP subject to form a complete sentence.

In summary, at each level, a combination is licensed by satisfying both "merge" and the features of the nodes involved. Any other ordering of auxiliaries, e.g., *He has should be watching the kids*, is ruled out by virtue of the selectional restrictions of each auxiliary and the identity requirement between a phrase's FORM value and the FORM value of its head daughter.

Note that I am omitting the details of how to ensure that each selected VP has already satisfied the selectional requirements of its own head verb (e.g., to prevent sentences like *He should have put.*) One way to fix this would be to add to the lexical entry of each auxiliary the requirement that the selected element must have already "discharged" its own selection requirement, e.g.:

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$$\text{HAVE: } \begin{bmatrix} \text{CAT} & \text{V} \\ \\ \text{SEL} & \begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{-EN} \\ \text{SEL} & <> \end{bmatrix} \end{bmatrix}$$

This may need revision, however, once we consider how a VP combines with its subject.

3   VP-deletion

Based on the data in (5)–(9) on the assignment sheet, the syntactic generalization about VP-deletion is that a VP can only be deleted when it is selected for by an auxiliary. This is apparent in the following contrastive pairs (the b sentences are taken from (9) on the handout):

(19)   a. Lee hasn't talked to Sam, but I have.

      b. *Lee hasn't talked to Sam, but I.

(20)   a. We donated some money to Nader's campaign, and Max says he has, too

      b. *We donated some money to Nader's campaign, and Max says he, too.

(21)   a. Felix is reading *The Brothers Karamazov* because Felicia is.

      b. *Felix is reading *The Brothers Karamazov* because Felicia.

(22)   a. Although the Sox haven't qualified for the playoffs, the Tigers have.

      b. *Although the Sox haven't qualified for the playoffs, the Tigers.

This phenomenon provides further support for the notion that auxiliaries select for the VPs they combine with, since such a model provides an easy way to account for VP-deletion. One way to do so, for example, would be to posit in our lexical entries that auxiliaries optionally do not select for anything, e.g.:

$$\text{HAVE: } \begin{bmatrix} \text{CAT} & \text{V} \\ \\ \text{SEL} & \left(\begin{bmatrix} \text{CAT} & \text{V} \\ \text{FORM} & \text{-EN} \end{bmatrix} \right) \end{bmatrix}$$

This kind of account would allow for the a examples above, where the complements of the auxiliaries are not realized (subject to certain discourse conditions), while still ruling out the b examples, where no auxiliary is present to suppress the VP.

Finally, VP-deletion is also relevant to the analysis of auxiliaries because it further demonstrates that auxiliaries constitute a natural subclass of verbs. That is, they share more properties than simply selecting for VPs. Further data will be necessary to look for other properties they might share.