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The Acquired Form of English Negation

NICHOLAS SOBIN
The University of Texas at El Paso
njsobin@utep.edu

Earlier approaches to the acquisition of negation in English which assume bottom-up derivation posit two stages of development. In one approach, functional categories (C, T and Neg) are not present in the early stage(s), and *no*, *not*, *can't* and *don't* are analyzed as adverbs. When functional categories become available, this early analysis is completely abandoned in favor of one involving functional categories. In another approach, functional categories are available from the start, but Neg, it is claimed, is inaccessible at first, meaning that negative expressions here too are first analyzed as adverbs. Negative concord data trigger a parametric change so that a Neg–as–adverb grammar changes to Neg–as–functional–head grammar. Both approaches posit an abrupt change between stages of acquisition. I propose an analysis of the acquisition of English negation utilizing top-down derivation. Under this view, the stage I analysis is a segue to the later stage II analysis in which Neg is introduced into derivation as an adjunct to T ([T [Neg]]). Neg may separate from T giving the appearance of an independent head. Aspects of Neg problematic for the bottom-up approaches above are resolved by the top-down approach.

Keywords: negation; stages of acquisition; top-down syntax; functional categories; maturation; continuity

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La forma adquirida de la negación en inglés

Los primeros enfoques para la adquisición de la negación en inglés que suponen una derivación ascendente postulan dos etapas de desarrollo. En un enfoque, las categorías funcionales (C, T y Neg) no están presentes en las primeras etapas, y *no*, *not*, *can't* y *don't* se analizan como adverbios. Cuando las categorías funcionales están disponibles, este análisis

inicial se abandona por completo en favor de uno que incluya categorías funcionales. En otro enfoque, las categorías funcionales están disponibles desde el principio, pero se afirma que Neg es inaccesible a este nivel de adquisición, lo que significa que aquí también las expresiones negativas se analizan primero como adverbios. Los datos de concordancia negativos desencadenan un cambio paramétrico de modo que una gramática Neg-como-adverbio cambia a una gramática Neg-como-cabeza funcional. Ambos enfoques plantean un cambio abrupto entre las etapas de adquisición. Propongo un análisis de la adquisición de la negación inglesa que utiliza la derivación de arriba abajo. Según este punto de vista, el análisis de la etapa I es una continuación del análisis posterior de la etapa II en el que Neg se introduce en la derivación como un complemento de T ([T [Neg]]). Neg puede separarse de T dando la apariencia de un núcleo independiente. Los aspectos de Neg que son problemáticos para los enfoques ascendentes mencionados anteriormente se resuelven mediante el enfoque descendente.

Palabras clave: negación; etapas de adquisición; sintaxis de arriba abajo; categorías funcionales; maduración; continuidad

1. Introduction

Arguing against the continuity hypothesis in regard to the acquisition of negation (*not*), Capdevila-Batet and Llinàs-Grau (1995) propose a version of the maturational hypothesis that involves two stages of acquisition. Their analysis is carried out in the context of a Principles and Parameters approach involving X-bar syntactic structures derived by raising operations. Functional categories are claimed not to be available in stage I, but to become available in stage II. As a consequence of the assumed theoretical orientation, there is a major discontinuity between stage I, in which negative elements such as *can't* and *don't* are lexical items in their own right, and stage II, in which functional categories including T and Neg have become available. In this latter stage, lexical *can't* and *don't* are claimed to have been rejected, while new lexical elements *can* and *do* are acquired as T-type lexical elements, and *not* is acquired as instantiating Neg. Assuming a functional structure in which Neg appears below T and above vP, contracted forms such as *can't* are, in stage II, the result of syntactically raising Neg to T.

In another work on the acquisition of negation, Thornton and Tesan (2013) also propose that the early stage involves negative elements as adverbs. Their work employs the continuity hypothesis, so functional categories are present from the start, but incorporating Neg as a functional head into the child's grammar requires that the child become sensitive to negative concord, which triggers the need for a negative head and NegP. In their analysis, *not* remains adverbial, and the negative head is '*n't*$_{[u\text{Neg}]}$', which is unrelated to *not* and bears an uninterpretable feature, syntactic [*u*Neg], which must be checked by an interpretable feature on an abstract negative operator in SpecNegP,

'OP$\neg_{[i\text{Neg}]}$'. While both of these approaches describe the main acquisitional facts, they do so based on syntactic analyses of Neg which prove to be problematic, as will be discussed below.

In the system of top-down derivation to be presented here (based initially on Phillips 1997), I propose that in English, the T and Neg heads of stage II are acquired as a single syntactic unit in which Neg is not an independent head but is instead head-adjoined to T (e.g. *can't* = [$_T$ can [Neg]]). That is, what would in bottom-up derivation be the derived contracted form involving head adjunction of Neg to T is instead the initial state of these elements in top-down derivation. Neg may separate from T in derivation following normal top-down procedures, giving the superficial appearance of an independent Neg head. On this view, there is not a major discontinuity in the treatment of items such as *can't* between stages I and II. Rather, lexical items such as *can't* are retained and reanalyzed in terms of the newly available functional categories T and Neg as sketched above.

A larger question which this paper addresses is the nature of early stages of acquisition. Are earlier stages of acquisition missteps which must be abandoned as acquisition proceeds, or do these earlier stages offer a useful foundation for further acquisition? This work points towards the latter.

Sections 2 and 3 outline the data and resulting theory of the acquisition of negation proposed by Capdevila-Batet and Llinàs-Grau (1995) and raise some concerns that arise from the bottom-up/raising approach to the analysis of negation and from the claim that children reject their initial analysis of words like *can't* and *don't* in favor of a completely different analysis. Section 4 discusses the analysis of Thornton and Tesan (2013) and the problems resulting from the syntactic analysis of negation that they propose. Section 5 relates aspects of a theory of top-down derivation in relation to the problem of analyzing the acquisition of negation, while section 6 provides detailed examples of top-down derivation and a modified version of the Pronounce Tense Rule (Adger 2003), which facilitates a better analysis of negative sentences and which eliminates the need for a rule of *Do* Support. Section 7 demonstrates the problems associated with viewing Neg as an independent head and I offer instead what I have called the Adjoined Negation proposal whereby Neg is initially merged into derivation as an adjunct to T. Here, various possible manifestations of T and Neg are explained in terms of the restricted set of normal operations available in top-down derivation. Section 8 offers conclusions and summary remarks.

2. Data Supporting a Maturational Analysis of the Acquisition of *Not*

Capdevila-Batet and Llinàs-Grau (1995) distinguish two stages in the acquisition of negation in which Neg takes the form of *no*, *not* and Neg-contracted auxiliaries. Their claim that acquisition of negation takes place in two stages is predicated on the following data.

2.1. Stage I Data

The data cited for stage I as set out by Capdevila-Batet and Llinàs-Grau (1995, 28-29) are as follows:[1]

A)

1. Neg + XP

(1) No turn (K. 21,0) (Bloom 1970)
(2) No dirty (K. 21,0) (Bloom 1970)
(3) Not blue (E. 23,3) (Bloom 1970)
(4) Not a teddy bear (Klima and Bellugi 1966)
(5) No picture in there (Ferguson and Slobin 1973)
(6) No pinch me (Klima and Bellugi 1966)

2. XP + Neg

(7) Wear mitten no (Klima and Bellugi 1966)

B)

1. Neg + NP_{Subj} + XP

(1) No Lois do it (K. 22,3) (Bloom 1970)
(2) No the sun shining (Klima and Bellugi 1966)
(3) Not Fraser read it (Klima and Bellugi 1966)
(4) No doll sleep (G. 25,2) (Bloom 1970)
(5) Don't bite me yet (Klima and Bellugi 1966)

2. NPSubj + Neg + XP

(6) There no squirrels (Klima and Bellugi 1966)
(7) Lois no hat (K. 22,3) (Bloom 1970)
(8) Man no go in there (K. 22,3) (Bloom 1970)
(9) He no bite me (Klima and Bellugi 1966)
(10) I can't catch you (Klima and Bellugi 1966)
(11) Wayne not eating it (Radford 1990)

In these data Neg is manifest as *no*, *not*, *can't* and *don't*. In Capdevila-Batet and Llinàs-Grau's (1995) interpretation of these data, *no* and *not* appear before or after a phrase XP (A.1 and A.2, respectively). Furthermore, when a subject is present, Neg appears either sentence initially before the subject (B.1) or after the subject and before XP (B.2). At this stage *no* and *not* appear to be in free variation.

[1] The data as presented here follow the original numbering system of Capdevila-Batet and Llinàs-Grau (1995).

2.2. Stage II: Data

The stage II data which Capdevila-Batet and Llinàs-Grau present (1995, 30) are as follows:

NP_{Subj} + {Mod/do/be} + Neg + XP

(1) Paul can't have one (Klima and Bellugi 1966)
(2) I didn't did it (Klima and Bellugi 1966)
(3) I didn't laugh (Klima and Bellugi 1966)
(4) You don't want some supper (Klima and Bellugi 1966)
(5) That was not me (Klima and Bellugi 1966)
(6) This not ice cream (Klima and Bellugi 1966)
(7) Paul not tired (Klima and Bellugi 1966)
(8) It's not cold (Klima and Bellugi 1966)
(9) I not crying (Klima and Bellugi 1966)
(10) Don't kick my box (Klima and Bellugi 1966)

In these data, *no* and *not* are no longer in free variation. Neg, now manifest exclusively as *not* or a Neg-contracted auxiliary, does not appear at the periphery of the sentence, but instead is found consistently in post-subject position.[2]

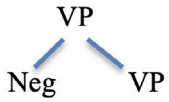
3. The Maturational Analysis of Capdevila-Batet and Llinàs-Grau

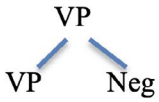
3.1. Details of the Analysis

Capdevila-Batet and Llinàs-Grau (1995) assume a Principles and Parameters approach involving X-bar syntactic structures. They argue that stage I differs significantly from stage II, which is essentially the adult grammatical system of negation involving *not*. In stage I, functional categories (C(omplementizer), T(ense), Neg) are not present,[3] and as such, negative elements such as *not*, *no*, *can't* and *don't* are analyzed as adverbial adjuncts to VP. Maturation involves the functional categories such as C, T and Neg coming on-line, with the consequence that *not* is reanalyzed as the functional category Neg, preceded by various auxiliary manifestations of T with which it may contract. *Can* and *do* are newly acquired forms of T.

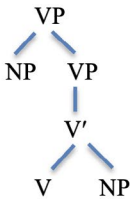
In more detail, the fact that stage I data display Neg in peripheral positions as in (A.1; Neg + XP) and (A.2; XP + Neg) when combined with a simple phrase XP (e.g., *No pinch me* or *Wear mitten no*) is explained in terms of adjunction to VP. Neg may either left-adjoin (1a) or right-adjoin (1b) to VP (Capdevila-Batet and Llinàs-Grau 1995, 38):

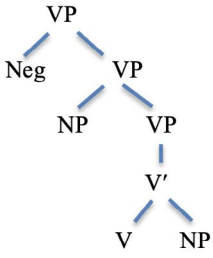
[2] An unpronounced subject, *you*, is present in the imperative form in (10) of the stage II data.
[3] Here, I will use T(ense) rather than I(nfl), which appears in the original text.

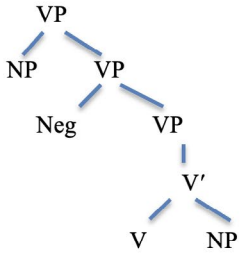
(1) a. 

b. 

Independent auxiliaries, for example *can* and *do*, are not present in stage I speech (Capdevila-Batet and Llinàs-Grau 1995, 39), indicating that forms such as *can't* and *don't* are simple lexical forms in their own right. Assuming that subjects are VP-adjoined, as in (2) below (Capdevila-Batet and Llinàs-Grau 1995, 35), the VP adjunction proposal also accounts for the fact that when a subject is present in the structure, Neg may either precede the sentence (see B.1 in section 2.1 above) or immediately follow the subject (see B.2 in section 2.1 above) (e.g., *No the sun shining* or *He no bite me*), as shown in (3) below (Capdevila-Batet and Llinàs-Grau 1995, 35-36):

(2) 

(3) a. 

b. 

When functional categories emerge in stage II, *not* is distinguished from *no* and is reanalyzed as the independent functional category Neg. Capdevila-Batet and Llinàs-Grau (1995, 32) offer the structure roughly outlined in (4) to show the stage II reanalysis of negation, with Neg appearing below T (the position occupied by modals and raised auxiliary verbs) and above VP.

(4) $[_{CP}$ that $[_{TP}$ {Modals/affixes}$_{T}$ $[_{NegP}$ not $[_{VP}$ NP$_{Subj}$ $[_{VP}$ V NP]]]]]

In contrast to stage I, *can't* and *don't* are dropped from the lexicon, and newly acquired forms like *can* and *do* appear independent of Neg in stage II. This analysis clearly involves raising to account for the displacement of the subject from Spec-V to Spec-T, the raising of auxiliary verbs to T, and the raising of Neg to T to derive Neg-contracted auxiliary forms. This raising is intrinsic to the view currently held by many that syntactic derivation proceeds in a bottom-up fashion. Thus, the lexical items *can't* and *don't* of stage I are viewed as a wrong analytical track, and as unrelated to the stage II analysis of negation.

3.2. Further Considerations

There are, however, reasons to think that the learner's stage I analysis of contracted negative forms like *can't* may not, in fact, be on the wrong track, but may instead be a segue to the later stage II analysis. First, such Neg-Aux contractions appear, in adult grammar, to have the status of words, in contrast to other contractions. For example, Neg-Aux contractions can be displaced, appearing in the C position in questions such as (5):

(5) Can't you ~~can't~~ see that shark?

This is not the case for other contractions such as *should'a*, as seen in (6):[4]

(6) a. She should'a seen that shark.
b. *Should'a she ~~should'a~~ seen that shark?
c. Should she have seen that shark?

In sum, while Neg-Aux contractions constitute a single, mobile lexical element, other contractions such as *should'a* appear to be phonological formations which do not have the status of a single element in the syntax.

From the perspective of top-down syntax—to be discussed in more detail below—forms such as *can't* in (5) above would have to be lexical items since they may be merged high in the structure in the C position, well before their claimed constituent elements T and Neg are merged. Further, as the sentences in (7) illustrate, Neg (*not*) is surprisingly transparent with respect to certain syntactic operations. Here, raising the first auxiliary following Neg over Neg to finite T should violate the Head Movement Constraint (Travis 1984, 131) whereby a head may only raise to the next head. Neg (projecting NegP) fails to block such head movement:

[4] The inability of such contractions to move was cited by Zwicky and Pullum (1983) in regard to their analysis of the affix/clitic distinction.

(7) a. Mary has$_T$ (not) ~~have~~ been singing.
b. Mary is$_T$ (not) ~~be~~$_{prog}$ singing.
c. Mary is$_T$ (not) ~~be~~$_{cop}$ the mayor.
d. Mary is$_T$ (not) ~~be~~$_{cop}$ on the porch.
e. Mary was$_T$ (not) ~~be~~$_{pass}$ arrested.

Also consider the sentences in (8):

(8) a. Mary did$_T$ not sing/*Mary T$_{past}$ not sang (Mary T$_{past}$ sang).
b. Mary might$_T$ (not) [$_{VP}$ sing/*sang/*singing].
c. Mary will$_T$ (not) [$_{ProgP}$ be$_{prog}$/*been [singing]].
d. Mary is$_T$ (not) [singing/*sing].
e. Mary has$_T$ (not) [sung/*sing].

In (8a), the presence of *not* appears to somehow block T from assigning a visible tense form to the verb; however, in (8b-e) where a modal verb in T assigns a bare form to the next verb, the presence of *not* does not disrupt this assignment. It might be tempting to claim, based on (8a-c), that *not* assigns a bare form to the next verb,[5] but that fails for (8d-e). If we say that the verbs *is* and *has* in (8d-e) assign form to the verb below before they raise past *not* to T, then we are back to the earlier problem of violating the Head Movement Constraint; therefore, Neg as an independent functional head is problematic. The bottom-up/raising view of syntactic derivation forces an analysis such as the one proposed above by Capdevila-Batet and Llinàs-Grau (1995) in which the stage I analysis of negation is completely abandoned in stage II.

4. The Continuity Analysis of Thornton and Tesan

4.1. Basic Dimensions of the Analysis

Based on the work of Zeijlstra (2004) and on Jespersen's Cycle of the evolution of negation, Thornton and Tesan (2013) propose a continuity analysis of the acquisition of negation rather than a maturational analysis, meaning that all functional heads (including C, T and Neg) should be available to the learner from the start. Thornton and Tesan (2013) assume that functional categories are present early, but that Neg—though available—lacks sufficient data to be realized early. The transition from Neg as exclusively adverbial to the establishment of a Neg head and NegP involves changing the setting of the Negative Concord Parameter, that is, the choice of whether negation is an adverb or a head. The initial easier setting is said to be adverb, since it does not require extra

[5] The transparency of Neg in regard to the selectional properties of T is tacitly recognized by Capdevila-Batet and Llinàs-Grau (1995, 33-40) in their assertion that Neg selects a VP complement, just as T does in the absence of Neg.

structure building (Thornton and Tesan 2013, 372). Utilizing Bellugi's (1967) stages 1 and 2 data (=Capdevila-Batet and Llinàs-Grau's stage I data), Thornton and Tesan claim that Neg is adverbial. Adverbial negation is purely semantic, not involving any licensing in the syntax. Later acquisition of Neg as a head involves switching the parameter to syntactic negation requiring NegP and syntactic licensing. The Neg head is '*n't*$_{[u\text{Neg}]}$' (unrelated to *not*), which bears an uninterpretable feature [*u*Neg] which must be checked by an interpretable feature [*i*Neg] born by a negative operator 'OP¬$_{[\text{iNeg}]}$' in SpecNegP. In this second stage (adult) analysis and despite the claimed parametric shift, *not* remains an adverb. The data triggering the change to/addition of a Neg head/NegP analysis are claimed to be the child's observations of negative concord, where two negative expressions are interpreted as negative rather than affirmative, as they would in adverbial negation languages. The negative operator 'OP¬$_{[\text{iNeg}]}$' in SpecNegP checks the negative [*u*Neg] on both the Neg head *n't* and on the second negative expression (e.g., *no*/*any* in *I don't want no*/*any soup*), yielding the negative interpretation. For Thornton and Tesan, "negative concord sentences thus constitute the input that informs children that (at least) one of the negative markers carries an uninterpretable negation feature that must be checked in the syntactic component. This is what motivates a NegP functional projection" (2013, 381).

4.2. Further Considerations

The preceding theory of the acquisition of negation is based on certain questionable assumptions about the underlying syntax. First, the claim that *not* is retained as an adverb in the adult grammar predicts that sentences with *not* should behave like sentences with the adverbs *often* and *never* in not triggering *Do* Support; however, this is not the case, as seen in (9):

(9) a. Mary often swims/*Mary does often swim.
b. Mary never swims/*Mary does never swim.
c. *Mary not swims/Mary does not swim.

Second, Thornton and Tesan (2013) recognize the problem with *Do* Support in such sentences (383; 393-94) but offer no solution other than to say that perhaps *Do* Support is not well understood, and that it may be an "independent requirement of English negatives, questions, and imperatives" (378, fn10). This non-predictive analysis is a step backwards from analyses which offer a general, systematic analysis of *Do* Support phenomena (e.g., Adger 2003) that easily extends to the constructions just named, as well as to other constructions such as VP deletion and tag question formation.

Third, the claim that adverbial *not* might appear in SpecNegP (Thorton and Tesan 2013, 379) cannot be correct if: a) the Neg head *n't*$_{[u\text{Neg}]}$ requires an element in SpecNegP bearing [*i*Neg] for syntactic checking; and b) adverbial *not* does not bear a syntactic negative feature.

Fourth, it seems inconsistent to claim that the NegP structure is hard to acquire when a) hierarchic structure is the norm in human language; and b) hierarchic structure involving T and *v* has been acquired early, as the continuity analysis claims.

Fifth, the settings of a given parameter are usually mutually exclusive. The virtue of a parameter lies in its generality, its ability to explain why a variety of things all behave in one way and not another. Thus, it seems odd that the adverbial setting would be retained for *not*, but at the same time switched toward a head analysis for a Neg head *n't*.

Finally, Thornton and Tesan (2013) offer an example of the structure of negative sentences showing that T/*do* precedes and is not a part of NegP (379):

(10) (a) John doesn't walk to school.
(b) [$_{TP}$ John does [$_{NegP}$ *Op*¬ $_{[iNEG]}$ [$_{Neg0}$ **n't** $_{[uNEG]}$] [$_{vP}$ walk to school]]]

Further, sentences such as *Mary couldn't have been swimming* show that the auxiliary verbs *have* and *be* appear below the Neg head *n't*. In order to form sentences like *Mary hasn't been swimming* and *Mary isn't swimming* with a structure like that of (10b), an auxiliary must raise past the Neg head to T. Thus, as with the analysis of Capdevila-Batet and Llinàs-Grau (1995), the analysis of Thornton and Tesan (2013) also involves violation of the Head Movement Constraint.

In sum, while the underlying syntactic analysis is essential to the claims about the acquisition of negation which this analysis proposes, it is problematic in fundamental ways.

In the alternative analysis offered below based on a top-down approach to syntactic derivation (Phillips 1996, 1997; Chesi 2007, 2015; Sobin 2020), elements of early acquisition such as *can't* are not dropped from the lexicon in stage II but are instead retained and reanalyzed based on the emergence in this stage of functional categories and on the observation of commonly available primary data. This proposed analysis results in greater continuity between the two stages in the acquisition of negation, and it resolves the questions raised above concerning the (non-)interaction of Neg with the system of syntax, as will be seen below.

5. Basic Aspects of Top-Down Syntactic Derivation

5.1. The Initial Top-Down Approach

Here I will outline those aspects of a top-down theory which are relevant to presenting an alternative analysis of the acquisition of negation. See Sobin (2020) for further details of this theory.

The top-down approach to syntactic derivation was first developed in Phillips (1996; 1997), later in Chesi (2007; 2015), and further extended in Sobin (2020). The

original derivational scheme offered by Phillips (1997) is given in (11). It is based on English, a right-branching language.

(11) Merge Right-Branch Right (MR-BR) derivation (Phillips 1997)
MERGE RIGHT
New items must be introduced at the right edge of a structure.
BRANCH RIGHT
Where a terminal can be attached to more than one position in the existing structure with no effect on interpretation, the attachment that results in the more right-branching structure must be chosen.

If '{X, Y} and Z' are acted on following MR-BR, then '{X, Y} and Z' is directly replaced by {X, {Y, Z}}. If X is internally merged with {X, Y}, the result is {X {Y, X}}.

As Phillips (2017) demonstrates, one of the advantages of this approach is that it has the ability to resolve what appear to be constituency conflicts. Consider the sentences in (12):

(12) a. '[Mary will] and [Jane might] write poems'
b. 'Mary [will write poems] and [could write novels]'

Whereas (12a) points to leftward branching with a sequence like *Mary will* forming a constituent which can coordinate, (12b) points instead to *will* participating in rightward branching, forming a constituent with any elements which follow it. The MR-BR proposal resolves the puzzle of why both structures are possible. Example (13) is a rough approximation of the top-down derivation of a sentence like *Mary will write poems*:

(13) a. [Mary, will]
b. [Mary [will, write]]
c. [Mary [will [write poems]]]

MR-BR derivation is structure altering. The coordination in (12a) can be formed when the constituent structure in (13a) is available in the derivation. Sentences like '*Mary will write*, *and might publish*, *poems*' may be formed when the derivation is in the (13b) stage. The coordination in (12b) involves the constituency available in (13c).

5.2. Nondirectional Top-Down Syntax

Chomsky (most recently, 2019a, 2019b and elsewhere) has suggested that directionality is not part of the core system of syntax. Incorporating that idea, we might replace MR-BR with (14):[6]

[6] This is also a modification of what appears in Sobin (2020).

(14) **MERGE AT THE EDGE**
Merge an element β with an edge element α forming a new set {α, β} (rightward merge) or {β, α} (leftward merge).

Following Chomsky, I assume here that the determination of direction of derivation in a given language is external to/not a part of the core grammar. If branching is 'rightward' as in English, we get the structures in (15):

(15) a. Merge Y with X (External Merge) ==> {X, Y}
b. Merge Z with {X, Y} (External Merge) ==> {X {Y, Z}}
c. Merge Q with {X {Y, Z}} (External Merge) ==> {X {Y {Z, Q}}}
d. Merge X with {X, Y} (Internal Merge) ==> {X {Y, X_C}} (X_C a copy of X)

With leftward merge and branching, as occurs in Japanese, we get the structures in (16):

(16) a. Merge Y with X ==> {Y, X}
b. Merge Z with {Y, X} (External Merge) ==> {{Z, Y} X}
c. Merge Q with [{Z, Y} X} (External Merge) ==> {{{Q, Z} Y} X}
d. Merge X with {Y, X} (Internally Merged) ==> {{X_C, Y} X} (X_C a copy of X)

5.3. Computation within a Small Domain

Generally following the ideas put forth in Chomsky (2013; 2014; 2015; 2019a-b) that a) the computation of sentences follows a small set of category-neutral procedures, and b) syntactic processes operate within a small structural space, Sobin (2020) proposes the procedures for top-down derivation in (17), illustrated here with rightward branching.[7]

(17) **THE TOP-DOWN DERIVATIONAL CYCLE:**

select an active head	X	Active head	(AH)
merge a selected non-head element	[X, Y]	Merge1	(M1)
merge a selected active head	[X [Y, Z]]	Merge2	(M2)
value features	[X [$Y_{(x)}$, $Z_{(x, y)}$]	Valuation	(Val)
select an active head	$Z_{(x, y)}$	AH	
merge a selected non-head element	[$Z_{(x, y)}$, W]	M1	etc.

Derivation terminates satisfying an interpretation based on '√+v' (= the verb root+affixation—the realm of interpretation for subjects and objects). Derivational steps are bypassed if there is no work for them.

[7] See Sobin (2020) for the detailed rationale for this proposed system.

5.4. Subject Arguments are Copied Downward

The derivation of a clause begins with the selection of the appropriate C, then externally merging a surface subject via M1. As will be illustrated below, the surface subject argument begins in what we will call Spec-T and is successively copied downward (internal merge) via M1 to Spec-√-v (√-v = the verb), where it is interpreted by √-v, in accordance with the argument structure associated with √-v. As the derivation proceeds, other heads are externally merged via M2.

6. Top-Down Derivation in Detail

6.1. Case Marking, Agreement and Argument Structure Satisfaction

What follows is a detailed derivation illustrating case marking, agreement and satisfaction of the argument structure of √-v. The features assumed here are broadly utilized in current syntactic theory (e.g., Adger 2003).

(18) *John saw a dragon*

a. C_{Decl} AH
[*u*Nom]

b. [C_{Decl} John] M1
[*u*Nom] [~~*u*Case~~:]
[φ: 3SG]

c. [C_{Decl} [John T_{past}]] M2
[*u*Nom] [*u*Case:] [*u*φ:]
[φ: 3SG]

d. [C_{Decl} [John $T_{past(John)}$]] Val
[~~*u*Nom~~] [~~*u*Case~~: Nom] [~~*u*φ~~: 3SG]
[φ: 3SG]

e. $T_{past(John)}$] AH
[~~*u*φ~~: 3SG]

f. [$T_{past(John)}$, ~~John~~]]] M1
[~~*u*φ~~: 3SG]

g. [$T_{past(John)}$, [~~John~~, √see–$Voice_v$]]]] M2
[~~*u*φ~~: 3SG] [*u*EA:]
[*u*IA:]
[*u*Acc]
[*u*Infl:]
[*u*T:]

h. [$T_{past(John)}$, [~~John~~, [√see–$Voice_v$]]]] Val
[~~π~~φ: 3SG] [~~π~~EA: John]
[*u*IA:]
[*u*Acc]
[~~π~~Infl: 3SG]
[~~π~~T: past]

i. √see–$Voice_v$ AH
[~~π~~φ: 3SG]
[~~π~~EA: John]
[*u*IA:]
[*u*Acc]
[~~π~~Infl: 3SG]
[~~π~~T: past]

j. [√see–$Voice_v$, [a dragon]] M1
[~~π~~EA: John] [φ: 3SG]
[~~π~~IA:] [*u*Case:]
[*u*Acc]
[~~π~~Infl: 3SG]
[~~π~~T: past]

k. [√see–$Voice_v$, [a dragon]] Val
[~~π~~EA: John] [φ: 3SG]
[~~π~~IA: dragon] [~~π~~Case: Acc]
[~~π~~Acc]
[~~π~~Infl: 3SG]
[~~π~~T: past]

l. The resulting structure for *John saw a dragon*:

[C_{Decl} [~~π~~Nom] [John [~~π~~Case: Nom] [φ: 3SG] [$T_{past(John)}$, [~~π~~φ: 3SG] [~~John~~ [√see–$Voice_v$, [~~π~~EA: John] [~~π~~IA: dragon] [~~π~~Acc] [~~π~~Infl: 3SG] [~~π~~T: past] [a dragon]]]]]]
[φ: 3SG] [~~π~~Case: Acc]

In the first stage, C_{Decl} is selected (18a), and *John* is merged via M1 (18b). In (18c), the T head is selected by C and merged via M2. Valuation (18d) takes place with C assigning Nom Case to *John* and T undergoing φ agreement with *John*. Further, T registers *John* as an argument to be internally merged in the next stage. In the second stage, with T as the next head (18e), *John* is internally merged via M1 (18f), and the verb (√see-$Voice_v$) is merged via M2 as a single unit (18g).[8] Valuation follows, with

[8] See appendix A for why √-v is treated here as a single element in the syntax.

John satisfying the external argument (EA) feature of the verb (18h). The third stage begins with the head √*see-Voice*$_v$ (18i) followed by merger of the object [*a dragon*] via M1 (18j). Since there is no further merger, valuation takes place (18k) with [*a dragon*] satisfying the internal argument (IA) feature of the verb and receiving Acc Case.

6.2. The Pronounce Tense Rule

Generally following Adger (2003), each functional verbal head values the verbal head below it, with its label, as in (19), determining the morphological form of that lower verb:

(19) a. '*She could have been singing*'
[She [could$_{modal}$ [~~she~~ [have$_{perf}$ [~~she~~ [be$_{prog}$ [~~she~~ [√*sing*–Voice$_v$]]]]]
[*u*Infl: modal] [*u*Infl: perf] [*u*Infl: prog]

b. '*She sang*'
[She [T$_{past}$ [~~she~~ √*sing*–Voice$_v$]]]
[*u*Infl: past]

c. '*Did she sing?*'
[$_{CQ}$ T$_{past}$ [she [~~T~~$_{past}$ [~~she~~ [√*sing*–Voice$_v$]]]]
[*u*Infl: past]

Example (19a) illustrates the labeling of verb heads which display various morphological forms, depending on the preceding verbal head.

The Pronounce Tense Rule (PTR) in (20) (based on Adger 2003) determines the position of tense pronunciation where tense features appear in more than one position, as in (19b-c).

(20) **THE PRONOUNCE TENSE RULE (PTR):**
Pronounce tense on the v head of vP iff vP is the sister of the highest instance of T; otherwise pronounce tense on the highest instance of T.

Following PTR, tense will be pronounced on *saw* in (18) and *sang* in (19b), and on T (*did*) in (19c).

6.3. A Revised PTR

One consequence of the claim made here that the early lexical forms *can't* and *don't* are retained and recast in terms of the functional categories T and Neg is that non-modal

T, not bearing a modal or auxiliary verb, will consistently bear the form *do*. That is, finite T is always present as a modal or auxiliary (e.g., *can* or *has*) or as a form of *do*. Thus, rather than (19b-c), we would have (21a-b):

(21) a. '*She sang*'
[She [do–T_{past} [$_{vP}$ ~~she~~ √*sing*–$Voice_v$]]]
{*u*Infl: past}
b. '*Did she sing?*'
[$_{CQ}$ do–T_{past} [she [~~do–T_{past}~~ [$_{vP}$ ~~she~~ [√*sing*–$Voice_v$]]]]
{*u*Infl: past}

The PTR may be revised in accordance with this claim as follows. Assume, as PTR does, that Tense is pronounced only once per clause. In most cases, PTR is pronounced high, on T in various forms. The exception encoded in PTR is the case where T has a sister vP. If '*do*-T' represents the form of *do* which is affirmative and non-emphatic, then PTR may be recast as in (22).

(22) **LEXICAL PTR (LPTR)**
Pronounce Tense on v rather than '*do*-T' only if v is the head of '*do*-T"s sister vP.

Following LPTR, Tense will be pronounced on '√*sing*-$Voice_v$' yielding *sang* in (21a), but on '*do*-T_{past}' in (21b) yielding *did*.

In contrast to forms of T which have semantic value, such as when T is occupied by a modal (e.g., *can*) or by an auxiliary (e.g., *is*), this simple form '*do*-T' has no semantic value beyond T itself, so suppressing its pronunciation is unsurprising. It leads to a more economical surface form. Forms of *do* which are semantically enhanced by emphasis (e.g., *DID* as in '*John DID see a dragon!*') or by negation (e.g., *didn't*) are pronounced without exception. This LPTR revision of PTR has the following advantages. Whereas the PTR requires *Do* Support and must treat the possibility of pronounced emphatic *do* as an exception, LPTR eliminates the need for *Do* Support and offers an explanation of why sentences with emphatic *do* and negated *do* are possible without having to treat them as an exception. This simplification is a result of the main thesis that stage I lexical items such as *can't* and *don't* are retained and recast in terms of the functional categories T and Neg, which become available in stage II.

7. Tense, Negation and Contraction

Sentences (23a-h) show some of the possibilities for how and where tense and negation are pronounced:

(23) a. She didn't sing.
b. She did not sing.

c. Didn't she sing?
d. Did she not sing?
e. She sang.
f. She often sang.
g. *She did often sing.
h. She DID (often) sing.

Before taking up the analysis of these sentences, let us first consider the problems that are induced if Neg is simply merged into the structure as an independent functional head.

7.1. Problems with Neg as an Independent Functional Head

In the analyses discussed above, the Neg head *not* (Capdevila-Batet and Llinàs-Grau 1995) or *n't* (Thornton and Tesan 2013) as in (23a-b) appears below T and above any auxiliary verbs and vP. However, as noted earlier, this view of Neg engenders problems of transparency regarding the Head Movement Constraint and the selection and affixation of elements complementing T. These problems with Neg as an independent functional head are also present with a top-down approach. Consider the derivation in (24). This and the following derivations incorporate the hypothesis that 'plain' T bears *do*.

(24) a. C_{Decl}		AH
b. [C_{Decl} , she] [φ:3SG]		M1
c. [C_{Decl} [she, [φ:3SG]	do–$T_{past(she)}$]] [*u*φ: 3sg]	M2&Val
d. [do–$T_{past(she)}$, ~~she~~]]] [*u*φ: 3sg]		AH &M1
e. [do–$T_{past(she)}$ [*u*φ: 3sg]	[~~she~~, not]]]]	M2&Val
f. [$_{NegP}$ not, ??]]]]		? AH & M1
g. [$_{NegP}$ not [?? ,	√*sing*–$Voice_v$]]]] [EA: ??] [*u*Tns: ??] [*u*φ: ??]	? M2&Val

If *not* is externally merged as a head (16e), becoming the new active head, then T_{past} is not available in the derivation to facilitate the Merge1 of *she* that is needed in (24f) to satisfy the EA feature and to impart the tense and φ values needed by '√sing-$Voice_v$' in (24g). It is also not clear on what basis the verb should be selected, so this cannot be how the derivation should proceed.

7.2. Lexical Adjunction of Neg to T

Recall that when T and Neg are contracted, the contraction has the status of a lexical element, possibly appearing displaced in C (e.g., *She can't sing => Can't she sing?*). The same is not true of other contractions (e.g., *You could'a sung =/=> *Could'a you sung?*). This suggests that contraction between T and Neg is significantly different to other contractions. Further, as noted already, children acquire *don't*, *can't*, etc. before they make use of the expanded forms such as *do*/*did not* and *cannot* (e.g., Menyuk 1969, 74; Capdevila-Batet and Llinàs-Grau 1995). In light of such facts, consider the following Adjoined Negation proposal:

(25) **The Adjoined Negation Proposal:**
The contracted negative stage I forms such as *can't* are the basis for formulating the Stage II analysis of Negation. When functional categories come on line, modals (e.g., *can*) and *do* are aligned with T, and Neg is treated as an adjunct to T, e.g., [$_{T}$ can [Neg]].

This is essentially the adjunct structure that would result from the raising and head adjunction of Neg to T. The claim here is that this adjoined structure is the starting structure for sentences involving negation. There is also the option of starting with various forms of plain affirmative T in affirmative constructions.

For the sentence *She didn't sing*, in top-down derivation (26) yields the final structure (27):

(26) a. C_{Decl} AH

b. [C_{Decl} , she] M1
[φ: 3SG]

c. [C_{Decl} [she, [do–$T_{past(she)}$[Neg]]]] M2&Val
[φ: 3SG] [*u*φ: 3SG]

d. [[do–$T_{past(she)}$[Neg]] , ~~she~~] AH &M1
[*u*φ: 3SG]

e. [[do–$T_{past(she)}$[Neg]] , [~~she~~, √sing–$Voice_{v}$]] M2&Val
[*u*φ: 3SG] [EA: she]
[*u*Tns: past]
[*u*φ: 3SG]

(27) [C_{Decl} [she, [[do–$T_{past(she)}$[Neg]] [~~she~~, √sing–$Voice_{v}$]]]
[φ: 3SG] [*u*φ: 3SG] [EA: she]
[*u*Tns: past]
[*u*φ: 3SG]

In (26e), T is positioned so that the EA, Tense and φ features of '√sing-Voice$_v$' are properly valued. Following the LPTR, [$_T$ do-T$_{past}$[Neg]] is pronounced as *didn't*.

As for sentences such as *She did not sing*, the Neg element may copy downward via Merge2, bearing the relevant features of T based on its inherent association with T, as in (28):

(28) a. C_{Decl} AH

b. [C_{Decl} , she] M1
[φ: 3SG]

c. [C_{Decl} [she, [$_T$ do–T$_{past(she)}$[Neg]]]] M2&Val
[φ: 3SG] [*u*φ: 3SG]

d. [[$_T$ do–T$_{past(she)}$[Neg]] , ~~she~~] AH &M1
[*u*φ: 3SG]

e. [[$_T$ do–T$_{past(she)}$ ~~[Neg]]~~ [she , Neg$_{(she)}$]]]] M2&Val
[*u*φ: 3SG] [*u*φ: 3SG]
[*u*Tns: past]

Just as any independent functional head X projects a phrasal XP, copying *not* downward (M2) leads to *not* with independent 'head' status and projecting NegP:

f. [$_{NegP}$ Neg$_{(she)}$, ~~she~~] M1
[*u*φ: 3SG]
[*u*Tns: past]

g. [$_{NegP}$ Neg$_{(she)}$ [~~she~~ , √sing–Voice$_v$]]]]] M2&Val
[*u*φ: 3SG] [EA: Mary]
[*u*Tns: past] [*u*φ: 3SG]
[*u*Tns: past]

This analysis resolves the transparency problems with Neg noted earlier. In (28e), Neg/'*not*' has split from 'do-T$_{past(she)}$[Neg]' via Merge2. Based on its initial unity with T, Neg carries the features associated with T, facilitating the copying downward of *she* and the valuations needed for '√sing-Voice$_v$'. Following LPTR, since T has NegP rather than vP as its sister, Tense is pronounced on T as *did*.

Thus, when children acquire words like *can't* and *don't* in stage I, they do not drop *can't* and *don't* from the lexicon. Instead, with the coming on line of functional categories, learners revise the analysis of these words, incorporating the functional categories into the core form 'T [Neg]', with modals like *can* reanalyzed as instances of T. The summary structure for *Didn't she sing?*, where *didn't* occupies C, is (29):

(29) [$_{CQ}$ do–T$_{past}$[Neg] [she [~~do–T$_{past}$~~/~~Neg~~$_{(she)}$ [~~she~~, Voice*v*-√sing]]]]

Here, the displaced T element must be copied to its home position via Merge2, facilitating the rest of the derivation. The summary structure for *Did she not sing?* is (30):

(30) [$_{CQ}$ do–T$_{past}$[~~Neg~~] [she [~~do–T$_{past}$~~[Neg]$_{(she)}$ [~~she~~, Voice*v*-√sing]]]]

Here, 'do-T$_{past}$[Neg]' in C must be copied to its base position for the derivation to proceed, but as with Quantifier Floating, the adjunct element, here Neg/*not*, may be pronounced on a lower copy (see appendix B).

Regarding sentences such as *She often sang*, with an adverb and with tense pronounced on the verb, adverbs seem to be 'invisible' to the derivational system. The derivation simply works around the adverb as though it were not there, as in (31), and the resulting structure is (32):

(31) a. C$_{Decl}$ AH

b. [C$_{Decl}$, she] M1
[φ: 3SG]

c. [C$_{Decl}$ [she, do–T$_{past}$]] M2&Val
[φ: 3SG] [*u*φ: 3SG]

d. do–Tpast AH

e. [do–T$_{past}$, ~~she~~]] M1
[*u*φ: 3SG]

f. [do–T$_{past}$ [~~she~~, often]] Adjunct intrusion
[*u*φ: 3SG]

g. [do–T$_{past}$ [$_{v}$P ~~she~~ [$_{vP}$ often , [√sing–Voice$_{v}$]]]] M2&Val
[*u*φ: 3SG] [EA: she] The 'phase' is now satisfied
[*u*φ: 3SG]
[*u*Tns: past]

(32) [C$_{Decl}$ [she [do–T$_{past}$ [$_{vP}$ ~~she~~ [$_{vP}$ often [√sing – Voice$_{v}$]]]]]]
'sang' via **LPTR**

While sentences like (33) are not possible, sentences like (34) with emphatic *DID* are:

(33) *She did (often) sing.
(34) She DID (often) sing.

As noted earlier, although this poses an exception to the original PTR, the matter is resolved by LPTR. Consider a structure like (32) but with emphatic *DO*, as in (35).

(35) $[C_{Decl}$ [she [DO–T_{past} [$_{vP}$ ~~she~~ [$_{vP}$ often [$\sqrt{}$sing – $Voice_{v}$]]]]]]

Following LPTR, Tense will be pronounced as *DID*.

7.3. Infinitival Negation

There are two different forms of the Neg + *to* combination, as in (36):

(36) a. We expect her not to like the soup.
b. We expect her to not like the soup.

Though *to* does not allow phonetic contraction, underlying forms like 'T_{inf} [Neg]' should be possible in parallel with finite forms like 'do-T_{past} [Neg]' (=*didn't*). Here we might say that the lexicalization of 'T_{inf} [Neg]' is *not to*, and that it is structurally distinguished from the Neg-lowering form *to not* (parallel to *did not*). This correctly predicts the fact discussed in Newman (2018) that an adverb such as *occasionally* cannot merge between *not* and *to* (since together they represent a single lexical element), as in (37a), but it may merge between *to* and *not* as in (37b), where the lowering of Neg results in two distinct elements:

(37) a. *We allow some faculty not occasionally to attend graduation.
b. We allow some faculty to occasionally not attend graduation.

8. Final Remarks

The analyses of Capdevila-Batet and Llinàs-Grau (1995) and Thornton and Tesan (2013) offer accurate descriptions of the facts of acquisition, but both do so on the basis of syntactic analyses which involve a Neg head that fails to behave like a normal functional head. The facts of the acquisition of negation as outlined above are fully compatible with the top-down approach to derivation offered here, where the Neg functional head in English is not autonomous, but rather subordinated/adjoined to T, explaining its seeming transparency with respect to the Head Movement Constraint and the transmission of features between verbal heads that determine morphological form.

Thornton and Tesan (2013) offer four predictions in support of their theory. The first is that inflected verb forms appear in utterances such as *He not fits in there*. This is claimed to show that *not* is adverbial, and that T may look past *not* to impose inflection on the main verb. However, as they note themselves, such instances of verb inflection are very infrequent, suggesting that a regular interaction between T and the verb is not present. With T absent, as the maturational analysis claims, these infrequent inflected forms may well be early imitative attempts at adult forms not involving T.

The second prediction is that early adverbial double negation will result in an affirmative assertion. Such double negation as affirmative is a pretty sophisticated use of negation. No evidence is offered that children do this early. Further, Menyuk (1969, 83) notes that the early spontaneous use of double negation by children (*I don't want no milk*) means negative.

The third prediction is that in the first stage children will produce what Thornton and Tesan (2013) term 'true negative imperatives'—imperatives which are just like affirmative imperatives but with the addition of *not*. This is, however, also the prediction of the maturational analysis of Capdevila-Batet and Llinàs-Grau (1995), who view stage I as involving only adverbial negation.

The fourth prediction is that structures involving Neg as a head, such as negative questions where negated T is raised to C (*What don't you like?*), are only available when the Neg head is established. But again, this is also predicted by the maturational view, where T, C and Neg are unavailable until stage II.

The analysis presented here is in general agreement with that of Capdevila-Batet and Llinàs-Grau (1995) in assuming a maturational view of the acquisition of negation that involves two stages of development and with their claim that the functional categories T and Neg only become available in stage II. However, the present analysis differs from that of Capdevila-Batet and Llinàs-Grau (1995) in the following respect. The bottom-up/raising orientation of the theory of syntax assumed by Capdevila-Batet and Llinàs-Grau (1995) forces the conclusion that *can't* and *don't* are simply abandoned in stage II, and completely different lexical items *can*, *do* and *not* are acquired, with *can* and *do* treated as instances of T, and *not* as the lexicalization of Neg. Syntactic raising is required to recreate contracted forms such as *can't* and *don't*. That is, this radical change between stages I and II in the learner's analysis of negation is an artifact of the assumed bottom-up theoretical framework involving raising. Alternatively, the top-down theory of derivation offers the view that the stage I analysis is a segue to the stage II analysis. In this view, *can't* and *don't* are not eliminated as lexical items, but instead are retained and reanalyzed in terms of the newly available functional categories. In particular, the observation of *can't* along with *can* in immediate post-subject (T) position triggers the alignment of these words with T. The contraction *-n't*, which bears the meaning "negative" from the start, is naturally aligned with a subordinate/adjoined form of the newly available Neg head. Thus, *can't* and *don't* are reanalyzed as [$_{T}$ can[Neg]] and [$_{T}$ do[Neg]], where *can* and *do* are now treated as instances of T, and where Neg is initially analyzed as an adjunct to T. Separation of Neg from T (by the normal top-down derivational operation Merge 2) results in the need for the full lexical form *not* which is also observable and learnable from adult speech. Since Neg is inherently related to T, when Neg separates from T to realize as *not*, it naturally bears the features of T needed to carry the derivation further. Thus, the problems for the bottom-up theory noted earlier concerning the failure of Neg to comply with the Head Movement Constraint and the transparency of Neg in regard to the complement

selection requirements of T are resolved in one stroke in this top-down approach: Neg fails to behave like an independent functional head because it is not an independent functional head; it is subordinate to another functional head T. This system of top-down derivation offers an avenue for addressing the apparent complexities of negation and contraction in a reasonably simple and uniform way. This analysis views the initial acquisition of *can't* and *don't* as the basis for later establishing the adult grammar of negation, and not as an acquisitional misstep.[9]

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Appendix A

In Sobin (2020), the active voice head $Voice_v$ was merged first, followed by the merger of the root (e.g., √see), creating the structural subsequence '$Voice_v$ -√see' claimed in Chomsky (2013, 43; 2015, 10). With $Voice_v$ as the bearer of inflectional features, it is claimed that the root raises to the voice head, forming an amalgam [R, v*] (='√see-$Voice_v$') (Chomsky 2015, 8). Here, '√see-$Voice_v$' has been merged as a single entity, as an element formed in the lexicon. This is due to the fact that in Welsh sentences such as (i), Sproat (1985, 175-76) claims that VSO languages are underlying SVO languages, and that the finite verb is merged with/raised to T:

(i) Gwelodd Sion ddraig (Sproat 1985, 176)
Saw–3sgpst *John* *dragon*'
John saw a dragon

From the perspective of top-down derivation, the verb in this displaced position cannot be the derived product of the elements $Voice_v$ and Root in the syntax, since these would be merged later in the derivation. Thus, the presence of an inflected verb in the T position points instead to the conclusion that formations such as '√see-$Voice_v$' are formed external to the derivation and are merged as a unit. Welsh, like English, is right-branching. The top-down derivation of *Gwelodd Sion ddraig* is as follows:

(ii) Gwelodd Sion ddraig.

a. C_{Decl}	AH
b. [C_{Decl} , ~~Sion~~]	M1
c. [C_{Decl} [~~Sion~~ , T_{past}/√gwel–$Voice_v$]]	M2 & Val
d. [C_{Decl} [~~Sion~~ [T/√gwel–$Voice_v$, Sion]]]	M1
e. [C_{Decl} [~~Sion~~ [T/√gwel–$Voice_v$ [Sion , ~~√gwel –$Voice_v$~~]]]]	M2 & Val
f. [C_{Decl} [~~Sion~~ [T/√ gwel –$Voice_v$ [Sion [~~√gwe–$Voice_v$~~ , draig]]]]]	M1 & Val

The subject is merged unpronounced in (iib). See Sobin and Zavala (2021) for the treatment of subjects merged but not pronounced in Spec-T, allowing for normal Case marking and agreement. In (iic), the verb *gwelodd* is merged in the T position, as mentioned above. In (iid), the subject is copied downward, where it is pronounced. In (iie), the verb is copied downward to its home position, where it can satisfy its EA feature with *Sion*, as well as its IA feature through the merger of *draig* in (iif). See Phillips (1997) for the lowering of verbs as a means of satisfying argument structure.

Appendix B

In bottom-up derivation, arguments are initially positioned vP-internally, in their positions of interpretation. For correct interpretation, any quantifiers associated with

an argument must be present at that level. As an argument is raised to surface subject position (Spec-T) through the various specifier positions of each verbal head, the quantifier may be dropped off along the derivational path of its argument, accounting for quantifier floating, as illustrated in (i):

(i) (All) The girls (all) have (all) been [$_{vP}$ (all) ~~the girls~~ smoking cigars]

A problem for this theory is that this is not true of passive subjects, as illustrated in (ii):

(ii) (All) The cigars (all) have (all) been [$_{vP}$ taken (*all) ~~the cigars~~]

Bottom-up derivation offers no explanation for why a quantifier cannot be left in post-verbal position. In contrast, top-down derivation offers an automatic explanation.

Following Sobin (2020), a surface subject argument in either an active or passive sentence is copied downward to Spec-v and no further. If the root is verbalized with Voice$_v$, the sentence is active, and the EA feature of the root is available and is valued by the argument in Spec-v. If the root is verbalized with v$_{unacc}$, the sentence is passive or unaccusative, and only the IA feature of the root is available. It is valued by the argument in Spec-v. As for Quantifier Floating, the adjoined quantifier need not be pronounced on the overt argument in Spec-T, but may be pronounced lower, on any copy of the argument on its path to Spec-v. The impossibility of post-verbal floated quantifiers as illustrated in (ii) is explained by the fact that a surface subject is never copied lower that Spec-v. In the same vein, when [T[Neg]] appears in C as in a question, Neg adjoining to T need not be pronounced there, but instead may be pronounced on the lower copy of [T[Neg]].

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Nicholas Sobin (PhD, The University of Texas at Austin, 1974) is Professor Emeritus of English (University of Arkansas, Little Rock) and Professor Emeritus of Linguistics (The University of Texas at El Paso). He has held multiple Visiting Scholar appointments at Harvard and MIT. His research interests include syntactic theory, language variation and computational linguistics. His publications have appeared in *Linguistic Inquiry*, *Natural Language and Linguistic Theory*, *Syntax* and elsewhere.