

# Words

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## 0. Background: Words and Things

It's somehow intuitive to think that knowing a language involves knowing the words of the language. Linguists that start with this notion quickly get into trouble by not being clear about what a "word" is such that a speaker might know it or what "know" is such that a speaker might "know" a word.

What properties does "nationalization" have that are not properties of its constituent parts and of the structure in which they occur? Can "nationalization" have special properties that, "The cat is on the mat" can't? Properties other than, "exists as a word"? Is "nationalization" related in a special way to "nation" that's different from the way that "The cat is on the mat" is related to "cat"? Is there a special notion of "lexical relatedness" or "paradigmatic structure" that's relevant in the former case but not the latter?

Are the "words" we're supposed to know "phonological words"? D'yawanna do syntax with phonological words? If so, you lose any hope of constraining the connection between the structures made up of syntactic atoms (in this case, phonological words) and compositional semantics, since relatively arbitrary pieces of syntactic/semantic structure can be stuffed into a phonological word.

If a "word" isn't a phonological word, what is it?

"In principle, words could be recognized without using morphological structure at all because the spelling and sound of a word usually provide sufficient information for this purpose." Seidenberg & Gonnerman, 2000 (*TICS* 4.9, 353-61).

Try, "In principle, sentences could be recognized without using syntactic structure at all because the spelling and sound of a sentence usually provide sufficient information for this purpose."

That is, is there supposed to be a difference between words and sentences here, and is this difference supportable?

[Try, "In principle, faces could be recognized without using the structure of facial features at all because the visual information hitting the retina usually provides sufficient information for this purpose.]

could "blick" mean "the dog"? (I was looking for Rover and I found blick in the yard)  
could "blick" mean "nationalize"?

These are difficult issues to think about, but they are made needlessly more difficult by the insistence on a lexicon/syntax dichotomy and the myth that it's been established that there's a difference between word-internal and word-external structure.

We have the tools to study the relationship between what's memorized and what's "constructed." Once we acknowledge that all composition of morphemes occurs in the syntax (and that morphophonology follows syntactic computation), we can see how "memorized" relations among morphemes are constrained by locality conditions stated over syntactic structure.

That is, it's all about locality defined over syntactic structures and information encapsulation within syntactically defined domains.

Jackendoff (1997) and the Wheel of Fortune corpus:

- (0) a. any friend of yours is a friend of mine
- b. a breath of fresh air
- c. may the force be with you
- d. etc. for tens of thousands of examples

Jackendoff argues that the "lexicon" should be extended to include units larger than phrases. But doesn't the Wheel of Fortune corpus rather argue against the correlation between "memorized" and "special linguistic properties"? We know we've encountered (0a) just as we know we've encountered "nationalization" (with a certain measurable degree of certainty). That means, in some sense, we've stored these items – in some way or other. But does "storage" necessarily imply "storage in a special linguistic Lexicon"?

Jackendoff's observations call into question the notion that we don't store information about structures unless the structures have special linguistic properties. None of the examples in (0) have special structure – none involve special connections between sound and meaning. Rather than arguing for an extended lexicon, Jackendoff is actually arguing that we should abandon the notion of a "lexicon" (of items with internal structure) entirely.

Jackendoff pulls a fast one on us. He suggests that anyone trying to keep "fixed expressions" out of the lexicon is trying to keep them out of the language. But, since fixed expressions are made of words (phrases, phonology, etc.), they are clearly part of language. What he fails to argue successfully is that fixed expressions have the sorts of meanings that need to be negotiated by the linguistic system. Knowledge about "any friend of yours is a friend of mine," is clearly knowledge about a linguistic object – but that linguistic object is constructed via the generative system of the language.

And that's my final answer.

## A short history of the lexicon as a special place for composition

- (1) Wasow (1977) “Transformations and the Lexicon”
  - i. adjectival passives formed in the lexicon (uninhabited island)
  - ii. syntactic passives formed in the syntax (J. was given a book)
  
- (2) **Correlation of properties** favors creating words in two different places
  - i. lexical formation associated with idiosyncrasy in form and meaning  
the hung jury, the shaven man (cf. J. was being shaved)
  - ii. lexical formation can’t interact with syntactic rules (so no raising to object followed by passive for adjectival passive constructions)  
John was believed to be sick, \*John remained believed to be sick
  - iii. lexical formation associated with change in lexical category (verb to adjective)  
a very driven worker
  
- (3) Strict Lexicalist counter to Wasow (see e.g. Lieber, Bresnan, Levin and Rappaport 1986): One place for word formation is sufficient and explains the uniformity of word formation from a phonologist’s perspective.
  - i. morphophonology of lexical and adjectival passive is the same (mostly)  
the unchosen option, the option was chosen
  - ii. the syntax of syntactic passivization can be projected from a passive participle created in the lexicon (derived unaccusative verb); this derives the interaction of raising and passive (a passivized raising to object verb is a raising to subject verb), as well as simple passivization
  - iii. adjectival passives can be created in the lexicon from participles  
generalization: adjectival passives are created from perfect participles (passive or otherwise) that are unaccusative (cf. fallen tree) (and “externalize the internal argument,” explaining the supposed lack of raising adjectival passives)
  
- (4) Dubinsky and Simango’s (1996) “two places” challenge to Strict Lexicalism – see the evidence in (5-6, 9-10):
  - i. the “two places to build words” model explains the correlation of properties associated with lexical vs. syntactic word formation by appealing to properties reasonably assigned to the Lexicon on the one hand and the syntax on the other
  - ii. whereas, the strict lexicalist position requires independent generalizations to capture any correlations among the properties  
if category-changing were relevant, the difference between the Chichewa stative and passive, both of which create verbs from verbal stems, would be unexplained  
**if, e.g., the “lexical” type of construction were created from the “syntactic” type of construction, the fact that the “lexical” types go along with inner morphology and the “syntactic” types with outer morphology would be unexplained**

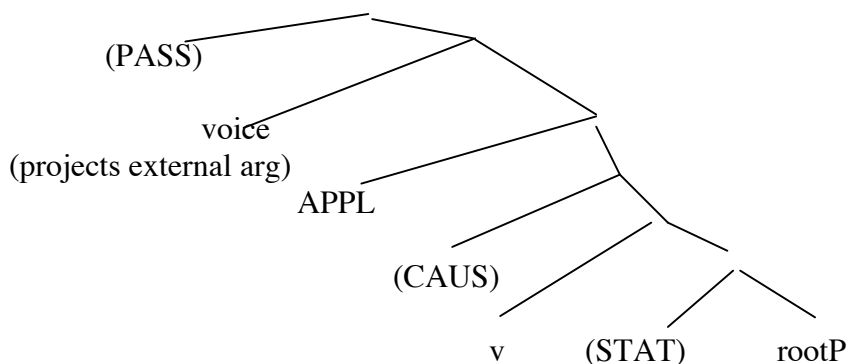
I think this last point has not been made or appreciated. The logic of the strict lexicalist position on passive requires creating the stative passives from (a sub-set of) perfect participles. But uniformly from a crosslinguistic perspective, and arguably in English as well, stative formation is an “inner” construction, close to the verb root, while passive (and perfect) are “outer” constructions, above little v.

(5) The contrasting behavior of the Chichewa stative vs. passive morphemes is accounted for by assigning stative and passive formation to different places. Below, we’ll see that data such as these follow from a difference between attaching below the little v that creates verbs (stative) and attaching above this little v (passive). For the most part, the exact same properties distinguish the English “adjectival” (really, stative) passive from the English syntactic (really, eventive) passive.

Illustration of one of the pieces of data described in (5):

- (6) a. Chimanga chi- ku- gul -idwa ku-msika.  
 corn AGR-PROG-buy-PASS at-market  
 ‘Corn is being bought at the market.’  
 [no idiomatic reading, and none possible with passive]
- b. Chimanga chi- ku- gul -ika ku-msika.  
 corn AGR-PROG-buy-STAT at-market  
 ‘Corn is cheap at the market.’  
 [idiomatic reading of ‘buy’ in the context of STAT]
- c. Chaka chatha chimanga chi- na- lim -idwa.  
 year last corn AGR-PROG-cultivate-PASS  
 ‘Last year corn was cultivated.’
- d. Chaka chatha chimanga chi- na- lim -ika.  
 year last corn AGR-PROG-cultivate-STAT  
 ‘Last year corn was bountiful.’

(7) Detour:  
 Structure of the VP = vP



For voice separated from little v, see Pylkkänen 1999, 2000  
 voice is involved in introducing the external argument; v makes the verb from the root and may be involved with Case on the object  
 APPL (in this position) relates an event to an individual (e.g., a benefactive)

CAUS would add a causative event (in the case, e.g., of morphologically derived causative verbs)

(8) Most straightforward argument for separating voice and v: Benefactive applicative constructions that relate a benefactive argument to a vP meaning occur lower than the external argument (thus the external argument, not the benefactive argument, becomes the syntactic subject). The external argument should therefore be introduced after the benefactive applicative argument in such constructions.

Chaga data (typical Bantu case)

N-a-i-zrìc-í- à	<b>mbùyà.</b>
<i>FOC-1s-PR-eat-AP-FV</i>	<b>9 friend</b>
'He is eating for a friend'	

Looking at the tree in (7)....

(9) Stative affix, must attach to root (so **below little v**):

- a. can create idioms (agentive little v defines domain for idiom formation)  
cf. the die is cast
- b. won't attach to applicative morpheme (=type of little v)  
cf., %The men are baked a cake. (\* on stative interpr.)
- c. won't attach to causative morpheme (=type of little v)  
cf., %These tomatoes are grown. (\* 'cultivated' reading)  
These buildings are just destroyed (ok, looking at recent war damage)
- d. meaning is connected to aspectual class of root (since is a root formation)  
cf., These children are grown/bathed/stunned
- e. triggers stem allomorphy (within little v implies within a cyclic "phase" (see Chomsky 2000) for phonological interpretation, although it's tricky to make this work without further assumptions)

(10) Passive affix, must attach **above little v**:

- a. can't create idioms  
see Ruwet (1991) on English & French stative passives
- b. may attach to applicative morpheme  
cf., The men were baked a cake.
- c. may attach to causative morpheme  
cf., These flowers were grown by farmers
- d. "meaning" is independent of root  
cf. The flowers are being grown/bathed/stunned.
- e. doesn't trigger stem allomorphy

The Devastating Dilemma of the Wasow/Dubinsky&Simango two places theory:

From the morphophonological point of view, all affixation looks similar (or at least the differences between different sorts of affixation viewed phonologically don't generally correlate with the lexical vs. syntactic distinction or the derivation vs. inflection distinction) (the same "affix" in Chichewa, identified phonologically, that creates statives also creates verbal "abilative" constructions which pattern with "syntactic" affixation)(NOTE: "able" constructions **must** pattern with syntactic passive and other "outer" constructions since they implicate the external argument introduced by voice)

From the point of view of semantic and morphosyntactic compositionality, all affixation looks similar (although here, distinctions could be drawn between certain types of inflectional affixes, e.g., case and agreement, and other affixes)

**But** still there is evidence for two classes of morphemes, corresponding roughly to an inner and an outer layer, that correlate with productivity and with the kind of interaction that the affixes can have with root semantics. That is, there is evidence for "two places" to build words.

Solution: Reconstruct the "two places" for word formation without assuming two places, in particular, without assuming a Lexicon. The "two places" emerge from the operation of the syntax, both structurally (position in the syntactic tree) and derivationally (involving cyclic domains).

The uniformity of morphophonology follows from the interpretive nature of the morphophonology, which uniformly follows the syntax.

The uniformity of compositionality follows from having the syntax perform all merger operations, including those between morphemes within a word.

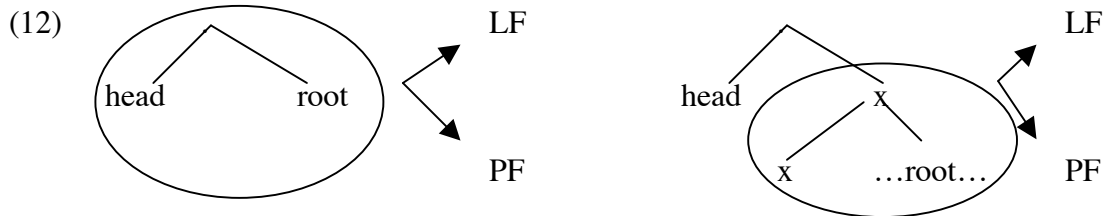
One place to build words is in the domain of a root, attaching a morpheme to the root before attaching a functional head that determines the syntactic category of the word (N, V, Adj). A second place to build words is outside the domain of functional head that determines syntactic category – the little v's, n's, and a's.

(11)

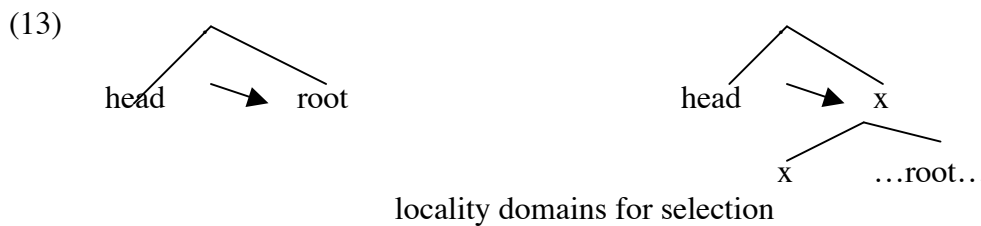


Derivationally, little x's determine the edge of a cyclic domain (a "phase" in Chomsky's recent terminology). Thus the combination of root and little x is shipped off to LF and PF for phonological and semantic interpretation, and the meaning of the root in the

context of little x is negotiated, using “Encyclopedic” knowledge. Heads attaching outside a little x take as complements a structure in which the root meaning (and pronunciation) has already been negotiated. PERHAPS...



Structurally, when a head attaches outside of little x, it sees the features of x locally, not the features, properties, or identity of the root merged with x. So its selectional properties are satisfied by the features of x, drawn from the universal syntactic feature set, not the properties of the root, which are idiosyncratic to the language and to the individual speaker. When a head attaches to a root, its selectional requirements must be satisfied by the idiosyncratic properties of the root.



Given the structure of grammar assumed within Distributed Morphology and the Derivation by Phase version of the Minimalist Program, our “two places” for word formation follow directly from the structure of the syntax and correctly account for the correlations among inner vs. outer, semiproductive vs. productive, messes with the semantics of roots vs. messes with syntactic argument structure, is associated with “special meanings” vs. is associated with predictable meanings.

So,     stative = root formation = attaches below little v  
           passive = voice = attaches above little v  
       All properties noted by Dubinsky and Simango follow directly

1.     **Modularity:** Are there two places to merge?

(14)   Why should there be two sorts of mechanisms in grammar for combining atomic units of structure and meaning,  
           one operating within words  
           one operating between words in sentences?

(15)   **Strict modularity I** (two places for composition, with completely distinct properties):

There are completely different atoms, structures, and methods of combination within and between words (=strict lexicalism)

(16) But, periphrasis alternates with affixation for expression of all (?) structural/decompositional meanings and linguistic structures

- a. John **cried**.
- b. **Did** John cry?
- c. John is **bigger**.
- d. John is **more** intelligent.
- e. John **took a leap**.
- f. John **leapt**.

So, **not** (simply) (15) (at least not in any close to obvious sense)

(17) As John Frampton insists I remind you, the failure of Strict Modularity I provides a strong conceptual argument against any theory like Lexical Morphology and Phonology that assumes different mechanisms for composition of morphemes in the Lexicon and composition of morphemes/words in the Syntax. Or, to put it differently, proponents of Lexical Morphology and Phonology need to show why we should believe in Strict Modularity I – the burden of proof is with them.

(18) **Strict modularity II** (only one place for composition):

All composition is syntactic; the internal structure of words is created by the same mechanisms of construction as the internal structure of sentences.

The internal semantic structure of roots (atoms for construction, along with the universally available grammatical features), whatever it may be and however it interacts with the syntax/morphology, is nothing like the internal structure of words and sentences and thus cannot be decomposed or composed in the grammar.

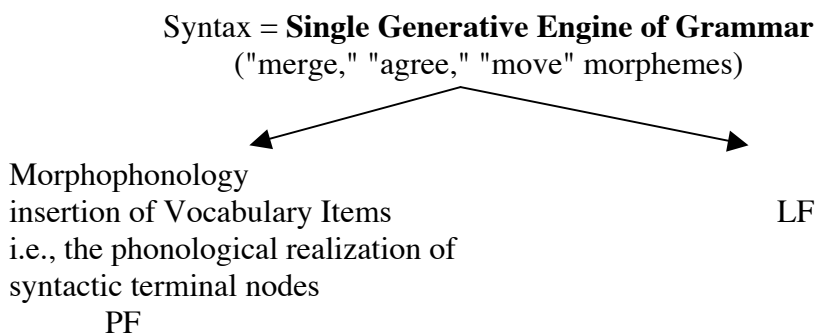
See Fodor 1998, Fodor & Lepore 1998 (vs. Pustejovsky and Jackendoff):

word (really, root) meanings don't decompose; the semantic **properties** of words (=roots) are different from the compositional/decompositional semantic **features** expressed through syntactic combination

it's a semantic property of "cake"s that they're baked to eat, but the meaning of "cake" does not decompose into baking, making, and/or eating

(19) On Strict Modularity II, there is only one mechanism in grammar for combining atomic units of structure and meaning, i.e., the Syntax

(20) Structure of grammar, the Distributed Morphology/Minimalist Syntax model





This structure of grammar dissolves the one vs. two place Dilemma: There is only one morphophonology, so we account for the lack of correlation between a “lexical” vs. “syntactic” division of morphemes and any phonological distinction. The “two places” are derived as described before, where the structure of grammar interacts with the special properties of roots that follow from Strict Modularity II to explain the contrasting properties of the “inner” morphemes (attaching in the domain of the root) and the “outer” morphemes (attaching outside the domain of little x’s).

## 2. Inflection vs. Derivation

But should we really be doing derivational morphology in the Syntax....

(21) Syntactic construction of words seems straightforward for “cat-s” and “dog-s,” i.e., for (some) inflection, but what about “glory-ous” and “drive-er,” i.e., derivation? Note that passive and stative fall into a fuzzy area in the traditional division between inflection and derivation. So **the question is whether the single generative engine solution to the “how many places” dilemma really applies to derivation as well as inflection.**

(22) Traditional generative syntax – two places again:  
Inflectional morphology is syntactic and gets spelled out in the phonology, after the syntax (see, e.g., SPE and Anderson’s A-Morphous morphology)  
Derivational morphology (from 1970 on) is “lexical” and pre-syntactic

(23) Why is inflection different from derivation? Traditionally....  
a inflection is paradigmatic, derivation not  
b inflection is productive, derivation not  
c inflection is transparent, derivation not  
d inflection creates things that can’t be mono-morphemic, derivation creates the same kinds of things (Ns, Vs, As) as mono-morphemes already are

BUT, derivation is in general just as paradigmatic, productive, and transparent as inflection, and neither derivation nor inflection can create things that could be mono-morphemic (nor can Ns, Vs, and As be mono-morphemic).

(24) “Paradigmatic” includes the notion that  
(a) inflection fills out feature space such that, for example, every noun will have all the case forms it needs to participate fully in the syntax and  
(b) inflection is typically syncretic such that a single form spreads to fill several cells in paradigm space, e.g., present tense “walk” fills all cells for person and number of subject except 3<sup>rd</sup> singular, filled by “walk-s.”



**properties with “derivational” morphology that attaches outside these category-determining heads.**

**Second:** The phonological realization of nodes from the syntax involves competition among “Vocabulary Items” for insertion at these nodes, as part of the phonological interpretation of a sentence. Thus units like “past tense /-d/” are not part of the syntactic computation; rather, nodes containing features like “past tense” are part of the syntax and the Vocabulary Item /-d/ is specified to be inserted into a node from the syntax that contains the feature [past tense]. All Vocabulary Items compete for insertion in every node from the syntax. **Competition explains “blocking”:**

oxen, \*oxes -en competes with -z for insertion into a [plural] node, and wins out here since it is specified to attach to “ox”

reversibility, \*reversibleness” -ity competes with -ness for insertion into a N-forming node that merges with adjectives. -ity wins out here since it is specified to attach to -able

### 3. Productivity

But isn’t inflectional morphology productive and derivational morphology not?

(32) The unproductive look of derivational morphology has two sources:

1. We’ve been mistakenly asking about the “productivity” of Vocabulary Items rather than asking about the distribution of morphemes, i.e., of the syntactic feature bundles that Vocabulary Items realize. So we’ve been asking whether, e.g., -ation suffixation is productive, rather than asking about the distribution of N(-creating) nodes merging with roots or merging outside V nodes (this is Beard’s point in emphasizing “separation” of syntactic/semantic features from their phonological realization in his Lexeme-Morpheme Base Morphology).

2. We’ve been focussing on the affixes (Vocabulary Items) spelling out the terminal nodes (morphemes/feature bundles) that merge with roots, i.e., the ones that initially determine syntactic categories. The connection between the roots and these terminal nodes is where the conceptual meets the syntactic and involves idiosyncrasy of various sorts.

Chomsky (1970): “The idiosyncratic character of the relation between the derived nominal and the associated verb has been so often remarked that discussion is superfluous [sic.]. Consider, for example, such nominals as *laughter, marriage, construction, actions, activities, revolution, belief, doubt, conversion, permutation, trial, residence, qualifications, specifications*, and so on, with their individual ranges of meanings and varied semantic relations to the base forms.”

(33) In each of Chomsky’s example nominalizations (laugh-ter, marri-age, construc-tion, act-ion, activ-ity...), a root is merged with a morpheme containing category (N) features and the particular meaning of the root in the context of this morpheme must be

negotiated by the individual language user and the community. The –ter, -age, etc. are Vocabulary Items inserted into the little n category-determining morpheme.

(34) The interaction of root semantics and the semantics of the heads that create nouns, verbs and adjectives determines how good a combination of a root and such a head will be. So, while “cat” as a noun is fine, as is “cat” as an adjective (“catty”), “cat” as a verb has no obvious meaning/use, although it can be given fine meanings contextually (“Meowing and scratching in imitation of his pet feline, Fred catted around the house for hours”).

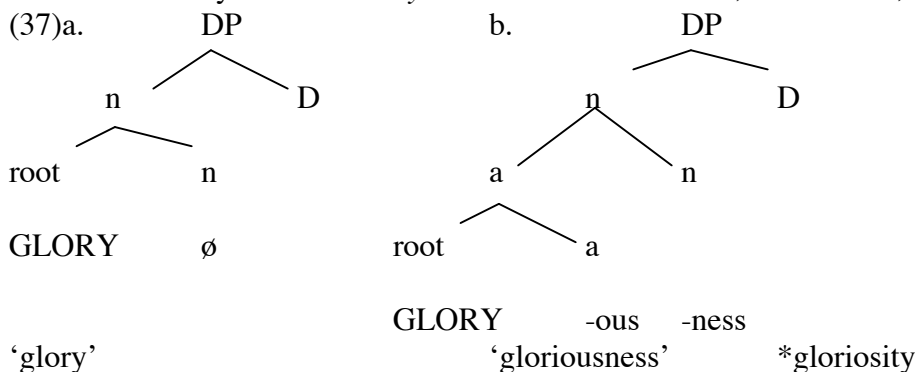
(35) Light verb constructions are phrasal expressions creating verbs from roots and show the same sort of “semi-productivity” as affixal creations of verbs from roots.

- |   |              |   |               |   |                |
|---|--------------|---|---------------|---|----------------|
| a | take a break | b | take a leak   | c | take a look    |
| d | ??take a cat | e | ??take a book | f | ??take a glory |

Would we argue from the data in (35) that syntax is semi- or unproductive?

(36) Fabb (1988) showed that the majority of English derivational suffixes do not attach outside other suffixes (there are some complications here, that I’m glossing over). Rephrasing Fabb’s discovery, we can say that **the majority of vocabulary items inserted into nodes creating Ns, Vs, and As are restricted to attach to roots**, and the roots to which they attach must be listed with these vocabulary items. (On Fabb, see the important discussion in Plag 1999.)

Vocabulary items (affixes) that select for particular roots may also select for particular other Vocabulary items. So –ity selects for a set of roots, but also for, e.g., –able



Where VI –ity doesn’t select an adjective-forming affix, as it doesn’t select –ous in (37b), it will not be inserted into the noun-forming terminal node (and will be “blocked” by –ness). Where VI –ity does select the adjective-forming affix, as it does –able, then –ness will be blocked by –ity for insertion into the noun-forming terminal node: return-abil-ity/\*returnablenss, refuse-abil-ity/\*refuseableness.... contrast with \*glori-ous-ity, gloriousness

So the “paradigmatic” quality of derivational morphology – filling of “cells,” productivity, blocking – is revealed when we examine heads attaching above little x.

(38) atrocious, atrocity – root ‘atroc’, with both forms built on root with overt a, n  
*“atrocity” would look like truncation (from atroci-ous-ity) to Aronoff*  
*the appearance of truncation is a clear indication of root formations*  
 various, variety – root ‘vary,’ with overt a, n, but null little v for verb ‘vary’  
 curious, curiosity, \*cury (root = ‘curious’), zero little a, -ity for little n

root	little x	little x
atroc	ious	
atroc	ious	ness
atroc	ity	
vary	∅	
vari	ous	
vari	ety	
curious	∅	
curious	ity	
glori	ous	ness
virtu	ous	*ity
virtuos(o)	ity	

NOTE: “virtuosity” is like \*”gloriosity” and can’t be from root “virtue”

(39) Aronoff (1976): where there is a noun form without the *-ous* related to an adjective with the *-ous* (glory, glorious), the *-ity* nominal formed via affixation to *-ous* is blocked (e.g., since “glory” exists, “gloriosity” is bad). This follows from the present analysis, since the existence of a noun without the *-ous* means that *-ity* outside *-ous* would be attaching to *-ous*, not to a root, and *-ity* doesn’t attach to *-ous*.

[(40) Problem for Aronoff’s generalization, and thus for our explanation of it:  
 pomposity, pompous, pomp  
 monstrosity, monstrous, monster  
 porosity, porous, pore

Does pompous contain pomp, monstrous monsters and porous pores?

- a. Say, **no** (true at least for some speakers for "pompous" and "porous") – how does one state/encode a relationship between "pompous" and "pomp" when this is learned?
- b. Say, **yes** (and take, for argument's sake, a learning path whereby a speaker learns "pompous/pomposity" before s/he learns any connection between "pomp" and "pompous") – can a Vocabulary Item's contextual features see into a derived stem like "pomp-ous" to identify the root within?]

#### 4. Recapturing the 2 places: Wasow revisited

(41) Over and over in the literature since Wasow, a distinction is observed between “lexical” and “syntactic” word formation. “Lexical” formation seems to involve the semantics of a root but not its syntactic argument structure, while “syntactic” derivation seems to affect the argument structure of the verb. Thus the discussion of “lexical” stative constructions vs. “syntactic” passive constructions in Chichewa in Dubinsky and Simango 1996 and the discussion of Japanese nominalizations in Sugioka 1998.

(42) As claimed above, the correct distinction isn’t between “lexical” and “syntactic” but between root affixation vs. affixation outside of head that already has attached to the root and created an N, V, or A. Root semantics, implicated in root affixation, isn’t compositional/decompositional (see again Fodor vs. Jackendoff and Pustejovsky) in the way that syntactic argument structure is, where syntactic argument structure is projected by functional heads (in particular, the direct object and the “external argument” or underlying subject). Thus the systematic differences between the two type of derivation follow without a lexical/syntactic dichotomy.

Vocabulary Items and Morphemes in their Places Cross-Linguistically

	<b>Place One Morpheme</b>	<b>Place Two Morpheme</b>		
<b>language</b>	<b>attaches to root</b>	<b>attaches to x</b>	<b>same VI</b>	<b>same features (same morph.)</b>
English	stative passive	syntactic passive	yes (mostly)	yes (tentatively) according to Kratzer
Chichewa	stative	passive	no	no
English	adj->N -ity	adj->N -ity	yes	yes
English	X-er -er/-or	deverbal -er	probably	maybe
English	-ee			
Japanese (Sugioka 98)	X-V compound nominalizer	X-V compound nominalizer	yes	probably

(43) For the **morphemes** (syntactic heads) involved in derivation, there is a strict correlation of properties:

a. Merger with root implies:

- negotiated (apparently idiosyncratic) meaning of root in context of morpheme
- apparent semi-productivity (better with some roots than others)
- meaning of construction cannot be an operation on “argument structure” but must depend on root semantics independent of argument structure (see Barker (1998) and Sugioka (1998), among others, on this distinction)
- corollary of the above: cannot involve the “external argument” of the verb

- b. Merger above a category-determining morpheme  
compositional meaning predicted from meaning of stem  
apparent complete productivity  
meaning of structure can involve apparent operation on argument-structure  
can involve the external argument of a verb

(44) The problem with drawing strong predictions from (43) is that **we see, overtly, the Vocabulary Items, not the morphemes** (thanks to David Pesetsky and Ora Matushansky for helping me see the delicacy of the predictions here). And, like *-ity*, many Vocabulary Items that can be inserted into morphemes that merge above category-determining morphemes can also be inserted into morphemes that merge with roots.

(45) Jay Rifkin (pc) has suggested that we should expect this behavior of most “derivational” heads of the usual category-changing sort; i.e., if these heads attach above a little *v*, *n*, or *a* (to create a *v*, *n*, or *a*), they should in general (*ceteris paribus*) be able to attach to a root. If a “nominalizing” morpheme essentially describes a semantic operation on its stem to create a noun of a certain sort, whether or not it may attach to a particular stem is a matter of semantic compatibility, not syntactic selection or subcategorization in any sense. Thus the “*n*” node that *-ity* is inserted into might freely combine with “adjectives” or with roots, if the semantics of the root were similar enough in the relevant dimensions to the semantics of adjectives.

(46) Despite the promiscuous attachment possibilities of category-determining morphemes, we can use the properties in (43) to make predictions about the behavior of Vocabulary Items if we’re careful.

For example, if a Vocabulary Item realizes a morpheme that involves the external argument, then we expect this Vocabulary Item to appear to be completely productive and to be able to appear outside Vocabulary Items that realize morphemes that create syntactic categories like *N*, *V*, or *A*.

The easiest way to see the distinction between the “two places” is in the comparison of an affix that only attaches to roots, e.g., English *-ee* or the Chichewa stative, with a similar affix from the same language that can attach outside little *x*, e.g., English deverbal *-er* or the Chichewa passive.

(44) Agentive *-er* suffixation involves the external argument of verbs and thus must appear completely productive and attach outside category-determining affixes.

So, given the analysis of “causatives” like “grow” in “John grows flowers” in Marantz (1997), the fact that “grower” means “one who grows plants,” i.e., involves a syntactically projected external arguments implies that:

- er* agentive formations should be productive
- er* agentive formations should go outside any affix creating a verb

(45) The correct predictions in (44) do not imply that the Vocabulary Item *-er* realizing an “n” node that creates “occupational” nouns cannot also appear attached directly to roots (just as *-ity* can realize an “n” node that attaches either to roots or to adjectives). So the existence of “debt-or,” “don-or,” etc. (see below) doesn’t lessen the predictive value of the analysis as explained in (44).

(46) Similarly, if we find a Vocabulary Item that forms words whose meanings consistently involve a particular negotiation with root semantics but never implicate verbal, nominal, or adjectival argument structure (and thus crucially never involve the logical object or external argument of a verb), then we expect the Vocabulary Item is realizing a node that must attach to roots, and we predict that the Vocabulary Item should appear semi-productive and should not appear outside of Vocabulary Items realizing a morpheme that creates a syntactic category.

(47) Example, *-ee* affixation in English

Barker (1998) shows that, despite what has been claimed in the previous literature, the *-ee* nominalization (in, e.g., “nominee”) does not refer to the direct or logical object of a verb – in fact, it doesn’t reflect a particular syntactic argument of the verb but a semantic role associated with the “episodic” interpretation of the root

(48) *-ee* nouns that correspond to **no** argument of the corresponding verb:  
amputee \*the doctor amputated John (John’s amputation),  
twist-ee (person whose limb was twisted) \*I twisted John by the knee

(49) *-ee* on “non-verbal” roots  
debt-ee, letter-ee, malefact-ee (cf. malefact-ive), patent-ee,

(50) “truncation” in derivational morphology = result of root derivations  
a. nomin-ate, nomin-ee (cf. nomin-al), *-ate* for little v, *-ee* for little n  
b. evacu-ate, evacu-ee, *-ate* for little v, *-ee* for little n

(51) As predicted by the analysis of root nominalizations in Marantz (1997), the “role” associated with the *-ee* nominal is one available to the possessor of a different (different features in little n) root nominalization of the same root:

- a. payee, escapee, devotee
- b. John’s pay, John’s escape, John’s devotion

(52) Note that we predict “truncation” for *-ee* as in (50) given the semantics of *-ee* suffixation. The semantics of root affixation should go along with the morphophonology of affixation to the morphophonological root.

- a. nomin-at-or, evacu-at-or, \*nomin-at-ee, \*evacu-at-ee
- b. \*nomin-er, \*evacu-er



The following examples (thanks to Michel Degraff for alerting me to their importance) show that the Vocabulary Item *-er/-or* may attach above or below little *v*, with the relevant properties correlating as expected. “donor” and “rotor” have special meanings that “donator” and “rotator” lack, and these differences correlate with truncation.

- c. donate, don-or, donat-or
- d. rotate, rot-or, rotat-or

Note as well that the *-or* attaching below little *v* may attach to apparently non-verbal roots as well.

- e. debt-or, malefact-or

## 5. Roots in Semitic and Universally

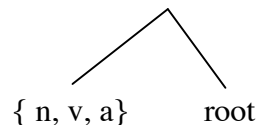
Semitic languages would seem to wear their root and little *x* structure on their sleeves...

(53) ktb root for “writing” in Arabic

kataba ‘he wrote’	kattaba ‘he caused to write’
kaataba ‘he corresponded’	takaatabuu ‘they kept up a correspondence’
kitaabun ‘book’	kuttaabun ‘Koran school’
kitaabatun ‘act of writing’	maktabun ‘office’

I’ve been arguing that all languages exhibit the sort of root-based word formation usually associated only with Semitic languages, such that:

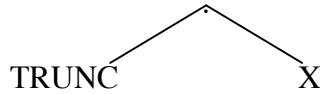
(54) All “lexical categories” involve a category head separate from the root that creates the noun, verb or adjective:



Meanwhile, phonologists (e.g., Ussishkin 2000) and morphologists (e.g., Bat-El 2000) have been revisiting McCarthy’s (1981) analysis of Arabic and arguing against the root as the basic combinatorial building block of Semitic verbs.

(55) Need to separate out phonological issues from morphological/syntactic/phonological issues

- a. Phonological issues
  - i. how to describe a “template”
  - ii. how to combine templatic, vocalic, and consonantal VI’s
  - iii. whether truncation, metathesis etc., are possible VI’s or rather readjustment operations performed in the context of VI’s.



- b. Morphological/syntactic/phonological issues
  - i. features of morphemes
  - ii. hierarchical structure of morphemes in words, phrases
  - iii. locality domains for informational interactions

(56) Modern Hebrew binyan, traditional description from Ussishkin

Binyan name	Function	Ex.	Gloss
I. paʔal	unmarked	katav	he wrote
<b>II. nifʔal</b>	<b>passive of paʔal</b>	<b>nixtav</b>	<b>it was written</b>
	change of state (inchoative) from paʔal		
	intransitive from of a transitive hifʔil		
III. piʔel	transitive	gidel	he raised
	intensive of paʔal		
<b>IV. puʔal</b>	<b>passive of piʔel</b>	<b>gudal</b>	<b>he was raised</b>
V. hifʔil	causative of paʔal	higdil	he enlarged
	transitive of nifʔal	hixtiv	he dictated
<b>VI. hufʔal</b>	<b>passive of hifʔal</b>	<b>higdal</b>	<b>he was enlarged</b>
		huxtav	it was dictated
VII. hitpaʔel	middle voice of transitives		
	reflexive, reciprocal		
	repetitive	hitkatev	he corresponded

(57) Word-base morphology views

Aronoff (1994, 134): “But within a lexeme-based framework in which morphology and syntax are autonomous, what Passive consists of syntactically is not directly relevant to its morphological realizations. Syntactically, it may be a pronoun of some sort...or it may be something else. For my purposes, the question is just not interesting.

Conversely, its morphology has no bearing on its syntax and should not be used as evidence for one syntactic analysis or another. This point emerges quite strongly from this analysis of Hebrew passives, for I see no sense in which either Biblical or Israeli

realizations of Passive can be construed as containing direct evidence for the place or nature of Passive in a syntactic representation.”

(58) But passive in Hebrew morphology has special status for Aronoff – two binyan are “simply” the passive version of active binyan, and niyal is also the “passive” version of paʔal (for Aronoff, the unmarked binyan). That is, IV. and VI. are not binyan (inflectional classes) but derived from binyan. In the case of the binyan that are exclusively the passive of other binyan, the relationship between the binyan is one of revocalization, while nifʔal provides a binyan to roots (from the default class) that aren’t otherwise specified for one. Is there nothing about passive, as opposed to inchoative or causative (of the direct sort), for example, that correlates with this behavior of Hebrew verbs? So, could it have been otherwise?

(59) Standard view: Binyan as (symmetrical) paradigm = 7 possible “forms” of a verb.

(60) Aronoff view: Binyan as asymmetrical non-inflectional paradigm  
same root in different binyan (I, II, III, IV) may be related by derivational rule  
(lexeme to lexeme, not involving decomposition to root)

(61) Word-based OT output-output relation view:

Ussishkin: all binyan except I. are asymmetrically related to I. but are thus symmetrically related to each other.

there is no decomposition to the root

(since not all verbs have a I. form, Ussishkin’s output-output correspondences are often between existing and nonexisting forms(!??))

(62) Conclusion: Special binyan behavior of passive does follow from the syntactic structure of passive, and more generally morphological facts are strictly related to/constrained by syntax, both within and between words. Root-based syntax and root-based morphology are supported by the Hebrew data and similar data cross-linguistically.

(63) *Is there something special about Semitic root and pattern morphology?*

*Possible claims:*

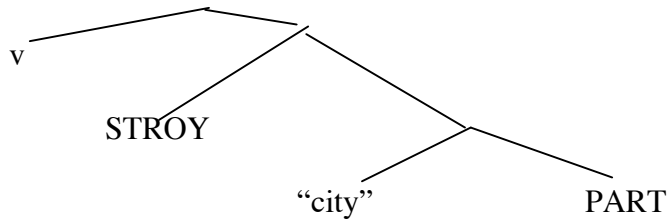
i. Because of their phonological properties – neither a prosodic unit nor a continuous phonological string – and their semantic properties – radically different meanings in different templates – consonantal roots are too small to be syntactic constituents or basic combinatorial units of a generative lexicon.

ii. *Since templates cannot be associated with unique meanings nor can the possible combinations of roots and templates be predicted in the general case, root and template morphology stands apart from stem and affix morphology of non-Semitic languages.*

iii. *Or – the behavior of Semitic roots might lead one to claim that in all languages “words” are memorized as wholes and generalizations about stems, affixes, triconsonantal roots, and templates are to be understood as generalizations about relations between words in the mental lexicon.*



(70) Thus, STROY is a manner root that incorporates a particle, spelled out *de-*, that takes an “inner subject” as the direct object of the syntactically derived verb “destroy.”



(71) So, other verbs containing the same root should imply external arguments:

- a. construct      John’s construction of the building
- b. instruct      John’s instruction of the children
- c. obstruct      John’s obstruction of justice
- d. restructure

(72) And, other verbs with prefix *de-* should have inner subjects:

- a. descend (unaccusative)
- b. demote
- c. decline (unaccusative)
- d. detain

(73) Note special meanings of roots like STROY in the various verbal environments in (71)

(74) In a sense there are no verbs (that is, no roots are verbs; there may be functional category verbs, i.e., vocabulary items that are inserted into little *v* nodes, such as “do,” “have,” “be,” and perhaps light verbs). If roots don’t connect with little *v*’s to become words, they may appear external to the verb word. So languages differ in the number of verb words that they display, from a handful (some Australian languages), to a relatively small number (languages with morphophonological restrictions on what can be a verbal root and what can fit into a verb word, like Semitic), to many many (languages like English)

(75) So, in general we expect roots to correspond to “non-verbal” material – manners, states, etc. – with, e.g., causative, stative and other “verbal” meanings constructed by little *v*, and with “passive” voice even higher in the structure.

(76) Semitic roots and templates correspond to sub-*v* material and *v*-and-higher heads, respectively

(77) It's worth highlighting in this context the neurolinguistic and other evidence that Prunet et al. (to appear) muster to argue for the independent status of roots in Semitic – argument for separate storage of root consonants from templates.

a. Arabic/French aphasic metathesizes root consonants in Arabic but not in French (for any words/morphemes), metathesizes only root consonants

- i. templates/vowels stay the same
 

kuʔuus	kusuuʔ	‘glasses’
laymuun	malyuun	‘lemon’
- ii. affixal consonants untouched
 

s-t-iʔnaaf	s-t-ifnaaʔ	‘appeal’
ta-waqquf	ta-qawwuf	‘stopping’

b. Hebrew aphasic places roots in wrong templates

yisog	yasug	‘he will retreat’
higdilu	gadlu	‘they enlarged’

(78) Harbour (2000) notes that the reasoning given above leading to the conclusion that “destroy” must be bi-morphemic below the level of little v (manner root associated with the external argument plus resultative particle associated with the “canonical” object) should apply equally well to a Hebrew root meaning “destroy” with the same semantic and syntactic properties (“obligatory” external argument interpretation (passive still implies agentive reading) and obligatory object). Thus tri-consonantal roots are plausibly bi-morphemic, and individual consonants might be vocabulary items spelling out particular roots or particles or relations.

(79) Certain sets of roots share the first two consonants. These plausibly decompose into a two consonantal root (the first two consonants) plus an additional morpheme spelled out by the final consonant:

(From Harbour 2000)

- a. HR
 

HRG	1 kill, slay
HRS	1 destroy, ruin, demolish
- b. PR
 

PRD	1 be separated, 5 separate
PRT	1 go Dutch, 3 detail
PRQ	1 unload, 3 dismantle, 7 disintegrate
PRR	7 crumble
PRS	3 explain

(80) Harbour goes on to argue that the first two consonants of a “root” in fact represent the syntactic/semantic root in most cases and that such roots are minimally bi-consonantal – and the first two consonants of the traditionally defined “root.” Thus, he argues, glide medial roots in Hebrew, which are arguably bi-consonantal in underlying form, must be monomorphemic, consisting solely of a syntactic root. Harbour argues that this implies that the glide medial roots can’t be transitive in the way that “destroy” is, since such transitivity requires two morphemes. Thus the prediction is that glide medial roots should not be transitive **from the root**.

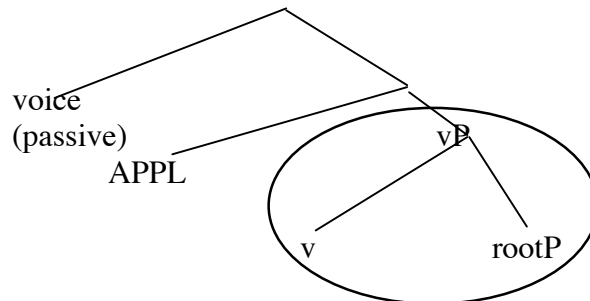
In a line of reasoning I won't repeat here, Harbour argues that transitivity in template 1 is a good test of root-determined transitivity, and that the overwhelming majority of glide-medial roots are intransitive in template 1, confirming the prediction drawn from analyzing these glide-medial "roots" as necessarily monomorphemic below the level of little v.

Arad questions Harbour's analysis. However, Arad and Shlonsky have analyzed a number of derivational processes in Hebrew that involve adding a consonant to the bi- or trilateral root, but as a prefix.

(81) Arad and Doron argue that, essentially, the Hebrew templates spell out morphemes associated with the little v system, which is involved in causative/inchoative alternations, middles and reflexives, agency, etc.

(82) However, choice of template for causative, inchoative, middle and similar meanings is still somewhat up to the root, indicating that constructing these meanings involves little v heads that merge locally to the root, allowing the root to be involved in choice of stem allomorphy. As Arad points out, the hiCCiC template (V.) allows causatives, unaccusatives, unergatives, non-causative transitives; so here, the template must be chosen by features of the root rather than root-independent features of little v.

(83) Recall that the voice head involved in syntactic passives necessarily stands above the little v that creates the vP.



This means that the root is not in a local relation with voice, and that features of the little v should determine allomorphy of voice, not features of the root.

(84) In fact, the template for the passive is (apparently) always determined by the template for the active, i.e., by features on little v, not (directly) by features on the root. That is, a root can't decide to take template I in the active and IV in the passive; the choice of passive is determined by the active template

Active		Passive
I CaCaC	→	II niCCaC
III CiCeC	→	IV CuCaC
V hiCCiC	→	VI huCCaC

(85) This pattern is demanded by the universals of clause structure and by general locality considerations, but only if we decompose the Semitic verb as argued here.

Precisely the same forces are at work here as in the distinction between passives and statives explained in section II.

(86) The same pattern is at work in explaining allomorphy in derivational morphology in English.

- a. Roots choose allomorphy of v, a, n creating heads  
vary-∅          vari-ous          vari-ety
- b. n, v, a creating heads choose allomorphy of higher n, v, a heads  
usability/\*usableness          nationality/\*nationalness
- c. roots don't choose allomorphy of n, v, a heads **over** a little x head with which they merge  
\*gloriosity    -ity doesn't attach to a-head -ous (-ous doesn't choose -ity  
allomorph of n-head)  
so, porous, porosity means root is "porous"

(87) Open question whether templates as vocabulary items are inserted into voice and v heads or are inserted as "theme vowels" in functional heads adjoined to voice and to little v (see Oltra-Massuet 1999 on theme vowels in Distributed Morphology). In any case, as a morphophonological fact, an outer template could delete an inner template, should both be inserted (one for/in construction with voice, one with little v). In the Hebrew system, however, it seems that a passive template (CV skeleton) is only required for the passive of binyan I, where arguably the root occurs with the unmarked binyan, suggesting that binyan I is inserted only where needed and that no "deletion" of templates is required for passive formation at all.

(88) Arad (2001), "Locality constraints on the interpretation of roots: the case of Hebrew denominal verbs"

(89) Verbs made from roots can have a variety of interpretations, but verbs made from nouns that are made from roots must share an interpretation with the noun.

(90) SGR

- a. sagar                    (to close)
- b. hisgir                    (to extradite)
- c. histager                (to cocoon oneself)
- d. seger                    N (a closure)
- e. misgeret                N (a frame)
  
- f. misger                V (to frame)    note M in derived verb root from noun  
CiCCeC (binyan)



- (91) RWM
- a. herim (to raise)
  - b. ram (high)
  - c. marom (heaven)
  - d. truma (a donation)
- e. taram V (to donate) note T in derived verb root from noun

(91) Again, derivation below little n yields different Ns, Vs, Adjs with negotiated meanings from the same root. Derivation above little n yields a verb whose meaning is associated with the root meaning already negotiated in the environment of the little n.

6. Conclusion: Let's go have a beer already!

## Appendix

Quick review of Marantz (1997): Chomsky's "Remarks on Nominalization" argues for (derivational) word formation in the syntax, and for the syntactic construction of the so-called "lexical categories" N, V, and A.

Problem: if we derived nominalizations from sentences transformationally, how do we account for the difference in behavior between "destruction" and "growth"?

- |     |  |   |
|-----|--|---|
| (1) | a. <b>that John destroyed the city</b>   | <b>that John purchased the computer</b> |
|     | b. *that the city destroyed              | *that the computer purchased            |
|     | c. <b>John's destruction of the city</b> | <b>John's purchase of the computer</b>  |
|     | d. the city's destruction                | the computer's purchase                 |
|     | e. John's destroying the city            | John's purchasing the computer          |
- 
- |     |  |
|-----|--|
| (2) | a. <b>that John grows tomatoes</b>             |
|     | b. that tomatoes grow                          |
|     | c. <b>*John's growth of tomatoes</b>           |
|     | d. <b>the tomatoes' growth</b>                 |
|     | e. John's growing tomatoes                     |
|     | f. tomatoes' growing (there would surprise me) |

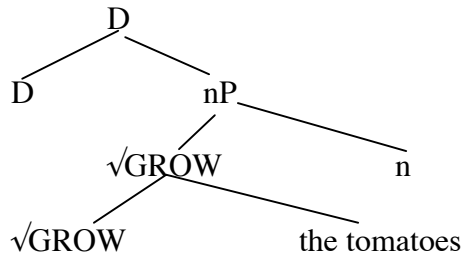
The answer Chomsky gives is that nominalizations aren't transformationally derived from sentences. BUT,

Problem: if we make nominalizations in the "lexicon," what prohibits nominalization of transitive "grow" but not transitive "destroy" and "purchase"?

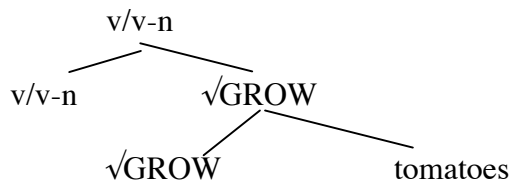
Answer: we don't make nominalizations in a lexicon. Rather, roots are underspecified for syntactic (really, morphological) categories like N and V.  $\sqrt{\text{DESTROY}}$  and  $\sqrt{\text{PURCHASE}}$ , but not  $\sqrt{\text{GROW}}$ , imply (or allow for the contextual interpretation of) an "agent" (or source or person responsible), and thus allow an "agentive" interpretation of the "nominals" 'destruction' and 'purchase.' To get any kind of agentive interpretation



- (7) creating a noun from a root **below** (without) **little v**  
growth of the tomatoes



- (8) John grows tomatoes, tomatoes are growing



(v-n, a little “v” (or other functional head creating a verbal environment) that doesn’t merge with an agent – see Kratzer’s “voice” heads)

- (9) The argument against Lexical Word Formation, if the Lexicon is taken as the locus of “special” (idiosyncratic, unpredictable) pronunciation and “special” (non-compositional, idiosyncratic, unpredictable) “meaning.”

If lexical word formation is characterized by correlations between “special sound (allomorphs)” and “special meanings (unpredictable from the structure),” then transitive “raise” should be formed in the lexicon in its special use in (32), and transitive “raise” should be available for lexical nominalization in this use. But transitive “raise” like transitive “grow” doesn’t form a (root) nominal – see (33e). This is predicted in the anti-lexicalist theory, since transitive “raise” requires a little v, and thus nominalizing transitive “raise” requires little n over little v, yielding “John’s raising (of the) pigs.” The special meaning of “raise” here is Encyclopedic in the environment of agentive little v, and the special sound is created by a morphophonological readjustment rule in the same environment.

- (10) a. the elevator is **rising** [v-n]  
b. John is **raising** his glass [v]  
c. John is **raising** pigs [v-a] (\*pigs are raising/rising)

- (11) a. \*John's raise of the glass [no v]  
b. The elevator's rise to the top floor [no v]  
c. ??the rise of the glass [no v]  
d. John's raising of the glass [v]  
e. \***John's raise of pigs**

(12) Certain meanings are (only) “structural,” i.e., only carried by functional morphemes, never by roots (e.g., external cause as in object psych constructions, benefactive/dative of double object constructions) – see Pesetsky (1995) in particular on this point. These meanings, then, never get expressed in root nominalizations.

(13) a. \*John’s amusement of the children  
b. \*John’s persuasion of Mary that she should leave  
(cause of root ‘amuse’ requires little v, so nominalization with the “amuser” expressed must be n **above little v** = “amusing”; “amusement” is a nominalization of the root, thus no cause and no causer)

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