**Reflections:**

**Foundations & Developments of Generative Grammar**

# Reflecting on the Generative Word

Hagit Borer

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# PART I

# Introduction and the Emergence of the Lexicon in GG

# 1 Linguistics as an Epistemological Query

## *1.1 What do English speakers know when they know the word **head**:*

1. /hɛ́d/, N, BRAIN-CONTAINING BODY PART (TOP, BRAIN, LEADER….)
   →*Listed*

2. a. Kim *headed* the team ⟶ *LEAD*
   b. Kim *headed* toward the team ⟶ *ADVANCE*

3. *Listed*:
   a. *head*, V + directional PP ⟶ *ADVANCE*
   b. *head* V + NP ⟶ LEAD

4. *Distinct Syntactic Insertion Frames*:

   a. *head1*: [+V, +[ ____ NP], +LEAD, +/hɛ́d/]

   b. *head2*: [+V, +[ ____ DIR], +ADVANCE, +/hɛ́d/]

   c. *head3*: [+N, +count, +BODY PART , +/hɛ́d/]

## 1.2 *Exploring listedness 101*

- Is *head* a single *word* or multiple *words*? Either way, is there a way to capture the proliferation of meanings without redundant listing?
- What, if any, is the relationship between the syntactic context of *head* and the meaning of *head*?

5. a. Kim *headed/lead* the team
   b. Kim *headed/advanced* toward the team.

## *1.3 Head in Compounds and Derivatives*

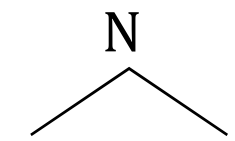
6. *head+gear → headgear* ⇒GEAR FOR HEAD(S)
   *bulk+head → bulkhead* ⇏HEAD FOR BULK

7. *brain-y → brainy* ⇒ HAVE BRAIN-RELATED PROPERTIES
   *head-y → heady* ⇏ HAVE HEAD-RELATED PROPERTIES

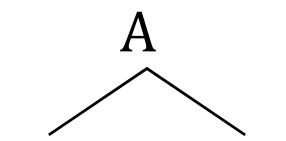
8. *Listed:*
   *bulkhead* ⟶ PARTITION OF ENCLOSED SPACE
   *heady* ⟶ GIDDY, INTOXICATING

- Is *head* inside *heady* an independently listed item? If yes, what is its relationship with *heady*? If no, is, e.g., *silk* also not an independent item within *silky*?

9. a.




b.




| | | | |
|---|---|---|---|
| *head* | *gear* | *silk* | |
| *towel* | *rack* | *brain* | |
| *bulk* | *head* | *head* | *-y* |
| *birth* | *day* | *flake* | *-y* |
| *walk* | *man* | *sturd* | *-y* |

- Is the structure of complex words with compositional meaning, such as *headgear* and *brainy* identical to that of non-compositional words, such as *bulkhead* and *heady*?

- And is that structure specifically syntactic structure?

## *1.4 Exploring listedness 102*

- What is the balance between the regular and the predictable and the idiosyncratic and listed?

- If we have three insertion frames for *head*, how can we capture the fact that *head* and *lead* have the same insertion frame when *head* has the same meaning as *lead*, but when *head* means *ADVANCE*, it shares the insertion frame of *advance*?

- If we list *heady*, how do we capture the fact that morphologically and syntactically, it behaves exactly like *brainy*? And if we list both *heady* and *brainy*, how do we capture the fact that *brainy* has predictable meaning?

# 2 What is listed? What is the Lexicon? What are Lexical Entries?

## *2.1 Aspects (Chomsky, 1965):*

- [T]he lexicon is a set of lexical entries, each lexical entry being a pair (D, C), where D is a phonological distinctive feature matrix "spelling" a certain lexical formative and C is a collection of specified syntactic features (a complex symbol). (p. 84)

- The lexicon consists of an unordered set of lexical entries and certain redundancy rules. Each lexical entry is a set of features [see above]... Thus the lexical entries constitute the full set of irregularities of the language. (p. 142, emphasis added)

[where 'redundancy rules' are in essence either universal or default mechanisms that predictably enrich and supplement feature combinations, and where 'irregularities' consists of everything that is not otherwise predictable from the redundancy rules]

10. What does the collection of specified syntactic features include, in Aspects?

    - Category (represented through a set of categorial features)
    - Insertion frame (subcategorization), specifying:
        - NP arguments, PP arguments, Sentential arguments, their order and whether they are optional or obligatory.

- At least some adverbial classifications[1]
- Item specific combinatorial expressions, such as Verb-Particle constructions (p. 190)

- Rule features, *including some that selectively govern derivational morphology* (see p. 189)
- Inflectional paradigms (informed by the syntactic properties and realized by a phonological paradigm. Explicitly *not* a combinatorial operation).

[1] In order to capture selectional restriction violations, such as 'resemble carefully', p. 166

And yet, even with all this in place (and with a full set of universally well-constrained phonological representations) what a *lexical entry* is remains undefined and entirely posterior. If α **is** a *lexical entry*, we can identify the pair (C,D) that it constitutes. But a pair (C,D) most definitely need not be a *lexical entry*. To the extent that lexical entries of the type Chomsky postulates are useful, it is clear that at the very least they must be – somehow - associated with some meaning. Chomsky, however, is reluctant to introduce semantic features into lexical entries , at least in part because of the problematicity already outlined for forms such as *head* and *heady* (*to be returned to*).

## *2.2 What does Chomsky (1970) change?*

With the exception of introducing the X'-scheme, Remarks on Nominalization (RoN) is an elaboration on a question mark left open in Aspects. In Aspects, Chomsky is reluctant to dispense with rules, albeit lexically restricted, that produce semi productive forms (like *brainy* and *silky*). In RoN he does take that step, declares the relationship between stems and derivatives neither hierarchical, nor rule governed.

*Evidence*: a systematic study of the syntactically predictable (by assumption a syntactic transformation) vs. the syntactically unpredictable (by assumption somehow lexically listed).

*Aim*: excluding from the syntax all aspects of relatedness that required access to listed entry-specific information.

11. The scientist knew the solution
    The enemy has destroyed the city
    The builder enhanced the foundations

### *2.2.1 Verbal Gerunds*

12. (the scientist) knowing the solution
    (the enemy) having destroyed the city
    (the builder) enhancing the foundations

13. *Mapping from (10) to (11):*
    a Eliminate Tense
    b Make the subject optional
    c Add –*ing* to the verb (or highest auxiliary)

14. a No change to the insertion frame (subcategorization)
    b No change in meaning beyond that which follows from -*ing* and absence of Tense
    c No change in PF (of verb or derived form).

(13) applies to all English sentences containing a verb or an auxiliary.

### *2.2.2 DERIVED NOMINALS (DN)*

15. (the enemy’s) destruction (of the city)
    (the student's) proof (of the theorem)
    (the scientist’s) knowledge (of the solution)
    (the builder’s) enhancement (of the foundations)
    (the building's) transformation (of the landscape)
    (the politician's) reading (of his defeat)

16. *Phonological unpredictability*

    a. Item-specific choice of nominalizer (note that *–ing* ending is always possible):
    *destroy* → *destruction*
    *prove* → *proof*
    *enhance* → *enhancement*
    *know* → *knowledge*
    b. Item-specific stem allomorphy:
    *destroy* ⇔ *destruction;*
    *prove* ⇔ *proof*

17. *Semantic unpredictability*:

    a. DN meaning unrelated to the source verbs: *transformation* (technical grammatical term)*; proofs; reading* (=*INTERPRETATION*) (*recital; transmission,* and many others)*;*
    b. Even 'predictable' meanings (e.g. *collection*) are ambiguous between action and result/object readings, with the latter unavailable for sentences or gerunds.
    c. Source ‘verbs’ may not be independently attested (*vision, fiction, aggression*)

18. *Properties that attest to the N status of DN (but not gerunds)*:

    a. 'Obligatory' complements optional in DNs but obligatory in gerunds
    b. (Logical) objects marked with *of* in DN, on a par with nouns (and unlike gerunds)
    c. Adverbs possible for gerunds but barred in DNs[2]
    d. Adjectives and determiners possible in DN, but barred in gerunds

[2] This observation has been challenged in multiple languages as well as in English. See, i.a., Fu, Roeper and Borer (2001), Bruening (2018)

19. a. Particle shift possible in gerunds, but barred in DN
    b. Dative shift possible in gerunds, but barred in DN (cf. 20)
    c. *tough* and raising constructions possible with gerunds, barred for DN (cf. 21-22)

20. Jess gave a book to Laurie ⇔ Jess gave Laurie a book
    Jess giving a book to Laurie ⇔ Jess giving Laurie a book
    Jess's gift of a book to Laurie !! *Jess's gift (of) Laurie of a book

21. Jude being easy to please
    Kim appearing to have won the game

22. *Jude's easiness to please
    *Kim's appearance to have won the game

### *2.2.3 CONCLUSION IN RON:*

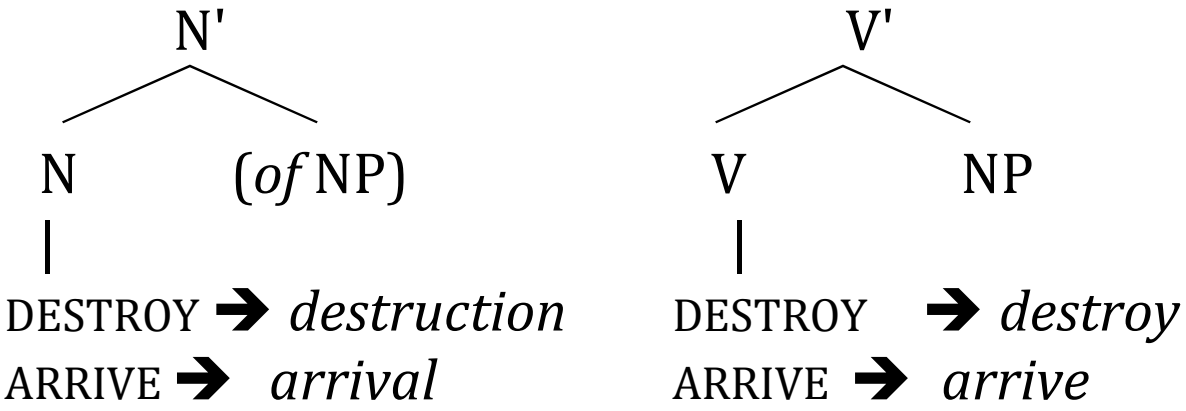
- Gerunds are syntactically derived (from sentences). One lexical entry, e.g., *appear*, with gerundive *appearing* emerging as a result of a transformational operation accomplishing the tasks in (13)

- *Appearance*, a DN, is a lexical entry distinct and independent from *appear*. *Important:* because the relationship between V and a DN which (seem to) share a stem is not always predictable, *all* derivatives, including predictable ones, must be lexically scrutinized. Thus, because e.g. *heady, bulkhead,* and *quittance* may allow unpredictable meaning and item-specific phonological properties, *silky, headgear* and *appearance* must be independent lexical entries from their (apparent) correlating stem.

## 3 Enter X'-theory:

Notwithstanding the previous conclusion, Chomsky introduces category-neutral entries for items with shared subcategorization, with category determined by the syntactic insertion context, and other syntactic properties holding constant (barring some category-specific restrictions). The different categorial instantiations are then spelt out differently (i.e. *arrive* vs. *arrival*), presumably at a later stage.

23. DESTROY, ARRIVE




- The relations between [$_{V}$ DESTROY] and [$_{N}$ DESTROY] is not derivational.
- That the PF of *destruction* or *arrival* is complex and contains within it a phonological sequence that is largely identical to *destroy* and *arrive* (and not the other way around) is not grammatically meaningful.
- Unless the category-neutral entry DESTROY contains some phonological information, the PF relatedness of *destroy* and *destruction* are a

coincidence (e.g., could have been *destroy* and *ruin*). In turn, whatever shared PF would need to be in the lexical entry DESTROY to exclude *ruin* mysteriously overlaps with that of the (apparent) stem.

- *Transmission* is ambiguous. It's meaning may be predictable from that of a category-neutral entry TRANSMIT, but it may also refer to *GEARBOX*, which is not related to the meaning of TRANSMIT. This meaning of *transmission-GEARBOX* would therefore need to be a lexical entry which is distinct from that of the category-neutral TRANSMIT, and which is (presumably) N. Its phonological similarity to the nominal instantiation of TRANSMIT can only be accidental. They are homonyms. But if all non-compositional instances are independently listed accidental homonyms, what is the status of the *semantic* argument against syntactically

derived nominalization, given the fact that all unpredictable homonyms are irrelevant?

- As not all lexical entries are category neutral (e.g., *transmission* as *GEARBOX*), lexical scrutiny is necessary to ensure appropriate insertion into the syntax. Insofar as lexical scrutiny cannot be avoided, the X'-scheme, appealing as it may otherwise be, is not formally less or more restricted than the rule feature which it replaced.

# 4 Subsequent developments

## *4.1 Prolegomena to Word Formation (Halle, 1973)*

- Halle rejects the view in Aspects of inflection as a (non-incremental) paradigm.

- Rejects the view that categorial (derivational) morphology is not rule driven.
- Accepts and bolsters the central view of the lexicon, by highlighting many item-specific phonological irregularities in word formation, mostly from the domain of inflection.
- Proposes that while word formation is driven by derivational rules, unlike syntax, its output is subject to a filter which associates specific lexical entries with both phonological and semantic anomalies. Accidental gaps are classified by the filter as possible but unattested (rather than ungrammatical).

## *4.2 More Subsequent Developments*

- Contrary to RoN, but compatible with Halle (1973) a significant research agenda takes off devoted to developing a derivational hierarchical model of Word Formation, which nonetheless is distinct from the syntax, primarily in being able to consult lexically-listed information, and in allowing the output to be listed and augmented with anomalies (e.g., the meaning of *transmission* as *GEARBOX*). Particularly important contributions came from Siegel (1974), Aronoff, (1976), Selkirk, (1982), Lieber, (1980), Williams, (1981a, 1981b), Kiparsky, (1982) with varying formalisms and implementations.

- The category-neutral entry proposed in RoN is, with few exceptions, abandoned, only to return reincarnated as a *root* in the late 90's

- While in Aspects (and even as late as LGB) Chomsky explicitly declines to elaborate on lexical semantics, work from the early 80's on, inspired by conceptual structure proposals in Jackendoff (1972, 1990) and with a grammatically-defined role originating with Pesetsky (1982) takes off, involving close and intense scrutiny of argument/event structure and its relationship with syntactic realization.

By the end of the 20th century, and as a result of subsequent theoretical augmentation, lexical entries, *words*, control at least the following:

- Theoretically articulated word-based lexical semantics
- Theoretically articulated word-based rules of argument structure alternations
- Theoretically articulated word-based rules of word formation (morphology)
- Theoretically articulated word-based phonology
- Formally articulated distinction between lexical rules and syntactic rules, with strictly enforced well-defined boundaries between the two.

# 5 Reinforcing the Barrier:

## *5.1 Formal rule Typology (Following Wasow 1977)*

| | Lexical Rules | Syntax (Transformations) |
|---|---|---|
| **A** | do not affect phrase structure | may alter the output of phrase structure rules |
| **B** | may change categorial labels | do not change category labels |
| **C** | are 'local' – involve only material specified in the insertion frame (e.g., arguments such as subject, object etc.) | need not be 'local'; formulated in terms of structural properties of phrase markers |
| **D** | apply before any transformations | may follow (other) transformations |
| **E** | may have idiosyncratic (listed, item-specific) exceptions | have few or no true exceptions |

## *5.2 The Lexical Integrity Hypothesis, Atomicity*

> "Words are atomic at the level of phrasal syntax and phrasal semantics. The words have "features" or properties, but these features have no structure and the relations of these features to the internal composition of the word cannot be relevant in syntax." (DiSciullo and Williams 1987: 49; see also Lapointe 1979)

## *5.3 The Projection Principle (Chomsky, 1981), the Inclusiveness Condition (Chomsky 1995)*

> "Given the numeration N …any structure formed by the computation … is constituted of elements already present in the lexical items selected for N; no new objects are added in the course

> of computation apart from rearrangements of lexical properties." (Chomsky 1995: 228)

## 6 But what ARE lexical entries?

The lexical entry as it emerges by the 90's is atomic and complete with properties which instruct the syntax, the semantics, the phonology, and the morphology. As such, it is a unique formal object. Syntactic terms, phonological terms, morphological terms, or semantic terms may map onto each other, but are never complete in the same sense.[3]

[3] Chomsky (1965) explicitly endorses the uniqueness of lexical entries in this sense, considering them complex symbols which, in his formal description, must be terminals. See the illuminating discussion in fn. 15 of chapter 2, p. 214

What, then, are lexical entries? Specifically, and assuming that they are (PH,SYN), what is the relevant set of phonological properties? What is the relevant set of syntactic properties?

Phonological words ARE well-defined objects (single main stress in English), but phonological words, as such, are not necessarily lexical entries (e.g. stem+clitic forms), nor are plausible lexical entries always phonological words (are *electro* or *bio* lexical entries? Also, are derivational affixes such as -*ful* or -*less* lexical entries?)

*But nonetheless, whatever else lexical entries might be, they must be associated with phonological information!*

24. Mary *advanced/headed* toward the goal
    Mary *led/headed* the team
    same meaning; same syntax; ***different*** PF.

25. Engaging in *composing* results in *a composition*
    Engaging in *writing* results in *an essay*
    same relations; same syntax; ***different*** PF

- Are *advance* and *head* the same lexical entry?
- Is *essay* possibly a nominal, grammatically-related/derived from *write?*
    - If the answer is *no*, PF must retain a central role in identifying what a *lexical entry* is, alone, or in conjunction with related instantiations (alternatively, in identifying what the *root* is).

- If the answer is *yes,* much of what we now know about syntactic operations would need to be revisited.
  - Argumentation for movement; ellipsis; agreement, and many other syntactic phenomena all crucially presuppose that phonological overlap marks grammatical relatedness.
  - That doesn't exclude the possibility that *essay* derives from *write*. It does mean, however, that within our present-day grammatical modeling, the claim is unfalsifiable.

But why should a unit recognized and defined primarily through its phonological characteristics have properties that affect syntactic and semantic computations?

All the more so as phonological words may convey the very same syntactic and semantic content otherwise conveyed by multiple words, both inter- and intra-languages:

26. a. $[_{VP}$ become $[_{A}$red]] → /bɪkə́m/+ /rɛ́d/
    b. $[_{VP}[_{V}$ $[_{A}$ red]-en]]) → /rɛ́dən/

# PART II

## Challenges to the Rich Lexicon:

## Constructivist and Root-based Approaches

## 1 Some Listing is inevitable!

The challenges are directed at:

- Associating (substantive) listed sound/sound-meaning pairs with atomic syntactically terminals.
- Associating (substantive) listed sound/sound-meaning pairs with syntactic insertion frames (=subcategorization, however derived).
- With postulating a non-syntactic combinatorial component that trades in categorial labels (aka Word Formation; Morphology).

What is the listed residue, and where is it, relative to the grammatical architecture?

## 2 Insertion frames: the (broad) Constructivist Perspective: The View from Syntax

27. a. The destruction was complete.
    b. *Kim destroyed (completely).

**RoN**: if *destruction* were derived from *destroy*, there would be no account for the absence of what is otherwise an obligatory argument of the verb.

**The Constructivist response**: Severing the arguments from the verb.

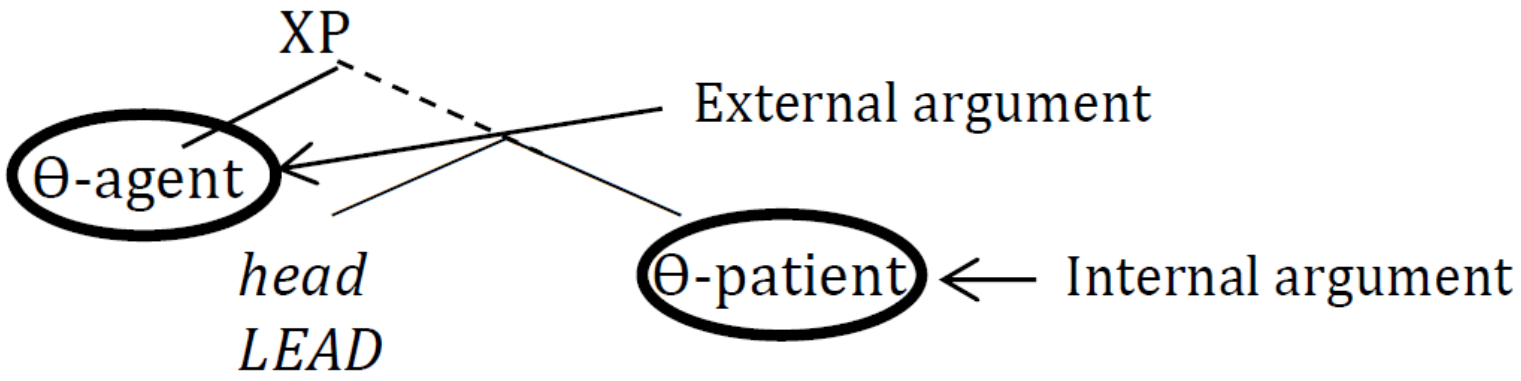
## *2.1 Lexical Semantics and Insertion Frames*

28. a. Mary *advanced/headed* toward the goal
    b. Mary *led/headed* the team

Lexicon Project, run at the MIT Cognitive Science Centre 1983-1989 with the aim of "discovering elements of meaning which recur systematically *in the definitions of words* and the principles which determine the mapping from lexical semantics to morphosyntax." (Levin, 2011, emphasis added)

29. *head*: V, Θ-agent, Θ-patient

30. *Agent* roles are syntactically external (in the sense of Williams, 1981); *patient* roles are syntactically internal



## *The Rationale*

> “The primitives of Θ-theory – notions like "agent", "patient", "goal" etc. probably meet the criterion of epistemological priority […]. On the other hand, the primitives of c-selection – syntactic categories like NP, S‘ [=CP], Small Clause etc. – do not meet the conditions of epistemological priority. They are not, in Chomsky's words, "concepts that can … provide the primary linguistic data that are mapped by the language faculty to a grammar.“ ……*If this discussion is correct, it follows that we want to derive the theory of c-selection from some other theory, whose primitives are epistemologically prior. Such a theory would be a semantic theory – specifically a theory of lexical semantics.*” (Pesetsky 1982, pp. 180-181, emphasis added)

31. ***Transitivity Alternation***

load the hay on the wagon/load the wagon with hay

***Locative Alternation***

the garden swarmed with bees/bees swarmed in the garden

***Transitive Resultative***

water the tulips flat

***Intransitive Resultative***

the river froze solid

***Locative Inversion***

in the forest lies a hidden treasure

32. LOAD: V, *agent, theme, location*

33. *load the hay on the wagon*

Merge *agent* as specifier of *v*P
Merge *theme* as sister of V
Merge *location* as sister of P-*on*

34. *load the wagon with the hay*

Merge *agent* as specifier of *v*P
Merge *location* as sister of V
Merge *theme* as sister of P-*with*

- The lexical semantics agenda successfully established dependencies between syntactic configurations and semantic effects.
- However, the claim that these connections are mediated through the lexical semantics of listed items, may, and has been, challenged.
- The alternative: direct correspondences between structure and interpretation

## *2.2 Toward severing arguments from lexical heads*

- Hugely influential Baker (1985); Hale and Keyser (1993), tying the interpretation of arguments to particular syntactic positions, although still linked with lexical entries.

- Much subsequent work, starting in the early '90's, converting these claims to correlations between event interpretation and syntactic structures, which are *not* mediated by the (semantics) of lexical entries (van Hout, 1994, 1996, 2000; Borer, 1994; Harley, 1995 i.a.)

35. a. The fire stations sirened throughout the raid
    b. The factory sirened midday and everyone stopped for lunch
    c. The police sirened the Porsche to a stop
    d. The police car sirened up to the accident
    e. The police car sirened the daylights out of me
    (Clark and Clark, 1979, cited and discussed in Borer, 2005)

36. a. The bells rang throughout the raid
    b. The factory signaled midday, and everyone stopped for lunch (by sirening)
    c. The police forced the Porsche to a stop (through sirening)
    d. The police car rushed up to the accident (while sirening)
    e. The police car scared the daylights out of me (with its sirening)

# 3 Insertion Frames, the Constructivist Perspective: the View from Semantics

- Davidson (1967): argumental roles are functions of events, not of lexical terminals.
- Parsons' (1990) Neo-Davidsonian approach:
  *agent* and *patient* (or equivalents) name a relationship between participants and events, not mediated through properties of the verb. The verb itself is an event modifier.

37. Mary headed the team

38. ∃e [*head* (e) & Agent (Mary, e) & Patient (the team, e)]

- Severing the (logical) subject from the verb: Marantz (1984), Harley (1995), Kratzer (1996) i.a..
- Severing the (logical) object from the verb: Borer (2003a,b, 2005), Ramchand (2008), Alexiadou and Lohndal (2015) i.a..

*Roles of event participants are independent of verbs and are assigned through dedicated syntactic event structure.*

39. a. The police car fell up to the accident
    b. Colourless green ideas sleep furiously

The infelicity of (39a) is on a par with that of the famously infelicitous (39b), and follows from world-knowledge/conceptual clash. As is the case

for (39b), such infelicity can be improved, if we make some changes to what we typically understand by *fall, idea* or *green*.[4]

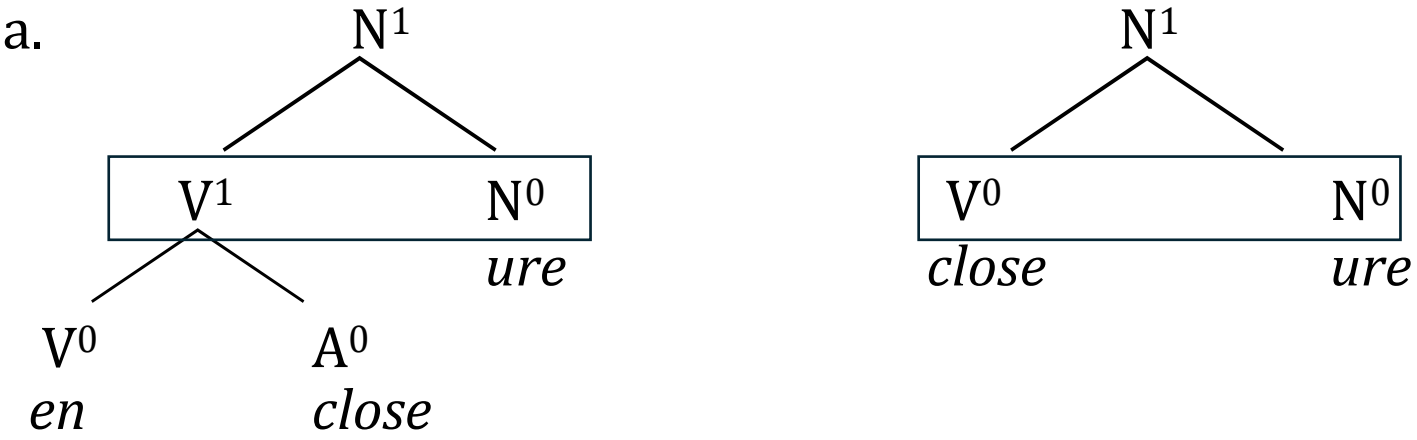
## 4 Insertion Frames, the Constructivist Perspective: the View from Word Formation

The X'-scheme presents a well-known challenge to integrating word formation into the syntax - Morphological rules do not increase bar level, and hence are perforce not syntactic (Ackema and Neeleman, 2004, i.a.).

[4] In formal semantic accounts, *Coercion* would map the 'standardized' meaning to a 'coerced' one, presupposing more rigid lexical semantics for substantive terminals than I do.

40. [close] [[clos]ure] $X^0$ +ure
    [en[close]] [[en [close ]] ure] X'+ure

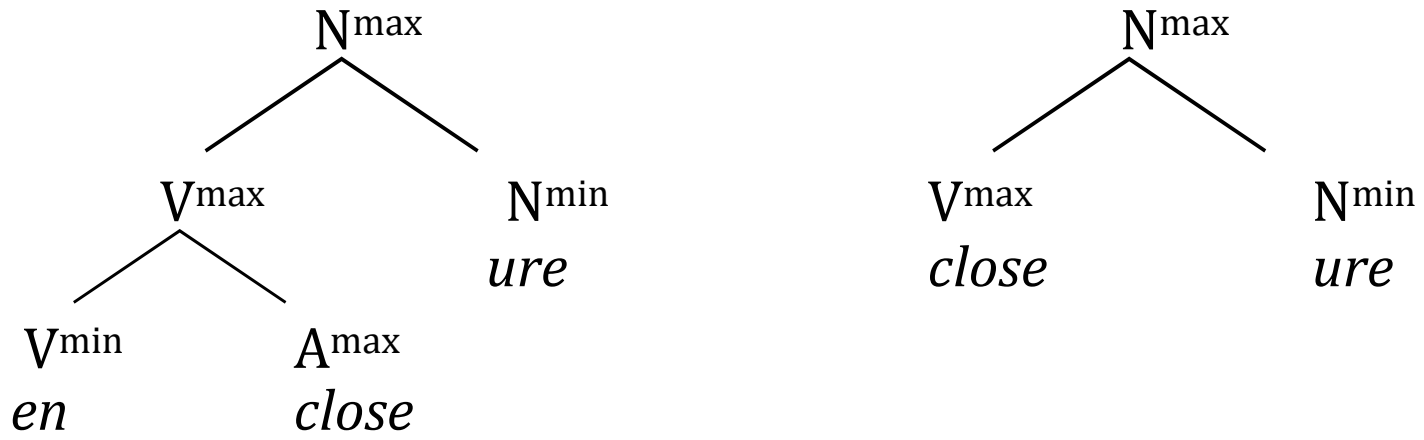
41. a.




The problem vanishes (almost entirely), however, once we adopt a relativized notion for levels and projections such as that outlined in Chomsky (1995) Bare Phrae Structure, and where there is no *formal* distinction between $X^0$, $X^1$ and $X^2$ that would make merger with one of them formally distinct from merging with any of the others, and where any

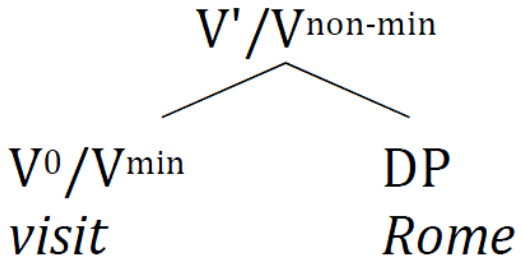
operation of *merge* which projects would end up, effectively, being an instance of merging with $X^{max}$:

42.



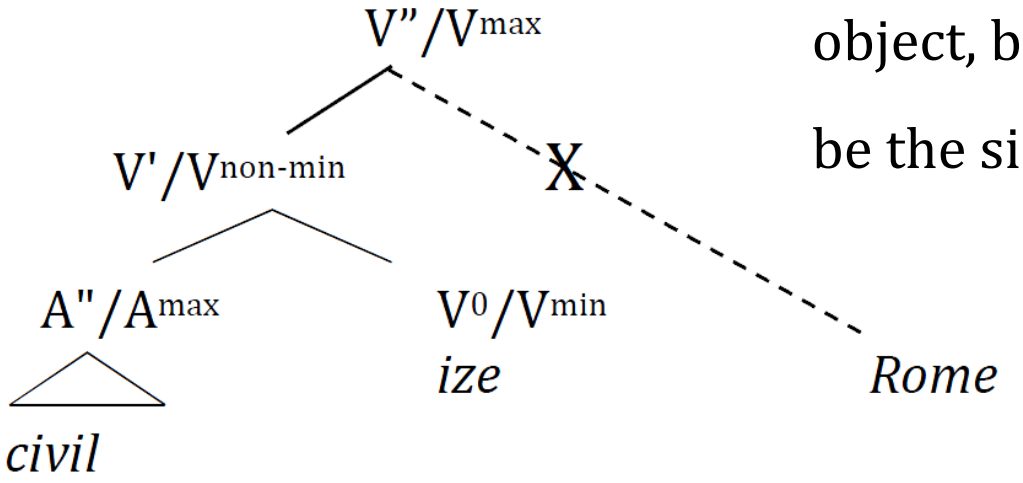

A problem does emerge, potentially, if we wish to exclude a structure in which an embedded X has a sister by assumption a complement. The problem, as it turns out, plagues equally powerfully X' executions and BPS execution:

43. a.

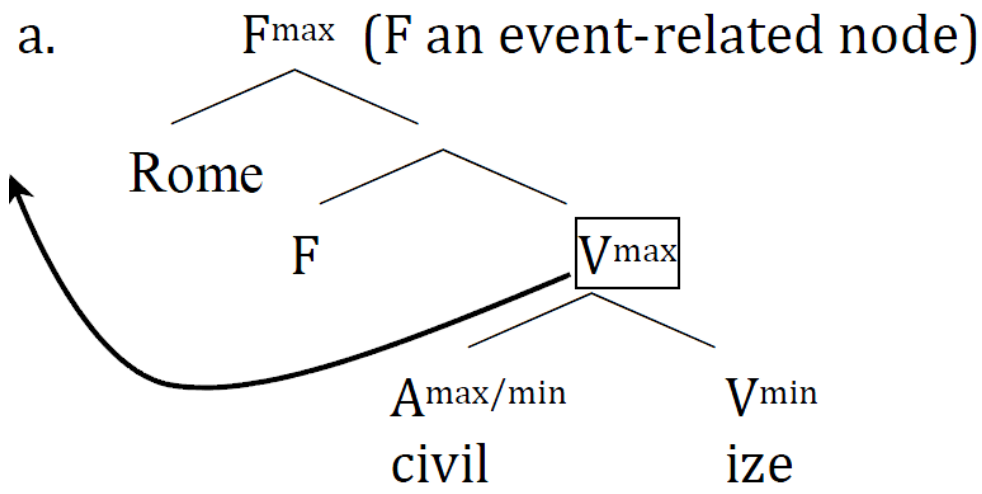



The direct object/patient must be a sister of $V^0$ /$V^{min}$

b.




*civilize* has an obligatory direct object, but in this structure it cannot be the sister of $V^0$ /$V^{min}$

44. a. 


b. civilize Rome

Severing the internal argument from the verb, which is independently motivated by syntactic and semantic considerations, also allows us to integrate word formation configurations into the syntax without additional cost.

## 5 Roots: back to RoN, with a twist

At the core of constructivists approaches lies the perception of non-formal (non-functional) terminal as a *root*. By assumption, roots are a-categorial entries with no syntactic properties. No category, no subcategorization, no formal features of any kind.

As in RoN, let us assume that these a-categorial roots are categorized by their context merger. If they merge with a D, for instance, they would be N. If they merge with T, they would be V, etc. (Alternatively, as in Marantz, 2000, they may be categorized by a potentially abstract categorial marker *v, n, a* etc.).

Unlike RoN, all roots are by definition mono-morphemic, as any non-vacuous morphemic combination requires structure, which is excluded in roots. Insofar as *destruction* is bi-morphemic, it could not be the nominal spellout of the root √DESTROY.

Returning now to *head*, we may assume √HEAD, which is devoid of category or an insertion frame, and which acquires its categorial properties in its syntactic context:[5]

[5] Alternatively:

i Kim … v +√head the team

ii She has a big n+√head

45. *Kim* [$_{T}$ …√HEAD – *ed* the team] √HEAD → V
    [She has $_{[D}$ a [$_{A}$ big √HEAD]] √HEAD → N She has a big *n+*√HEAD

In an additional twist, the meaning of √HEAD is determined in a larger syntactic context, context, hence giving rise to the *LEAD* vs. *ADVANCE* (and recall *siren*) interpretation.

46. a. Kim *headed* the team ⟶ *LEAD*
    b. Kim *headed* toward the team ⟶ *ADVANCE*

As arguments are severed from the lexical entry, little goes wrong by assuming syntactically inert roots. As the meaning of roots in context varies so widely, little goes wrong if we assume that the meaning of the root – assuming it does have some meaning - contributes little to the

grammatical derivation or its formal semantic interpretation. While delimiting the range of possible interpretations for an expression such as *head* is definitely part of any broad description of language, I hold the view that such delimitation, when we come to understand it, would not be grammatical, nor would it have any syntactic or formal semantic significance.

As it turns out, it is exactly the type of malleability, for substantive words, that has led Chomsky (1965) to set aside semantic features, when characterizing lexical entries:

47. “(=42)

a John is as sad as the book he read yesterday

b He exploits his employees more than the opportunity to please

c Is Brazil as independent as the continuum hypothesis?

Clearly, these are deviant and must be marked as such in a descriptively adequate grammar. In each case, the deleted items differ in selectional features from the items with which they are compared. Thus, *sad* is [post-Animate] in the matrix sentence of (42a) and [post-Inanimate] in the embedded sentence, and possibly this might be regarded as the factor that blocks the transformation and prevents deletion. The only alternative, in these cases, would be to assume that two homonymous lexical entries are involved, in each of the examples of (42) [*fn. omitted*]. In introducing examples of this sort, however, we touch on problems of homonymity and range of meaning that are cloaked in such obscurity, for the moment, that

> no conclusions at all can be drawn from them. (p. 183. See also fn. 15, p. 214)

Roots, however, must be associated with phonology, a point to which I will return.

## 5 An Impoverished Lexicon and PF: Late Insertion

**Lexicalism**:

- The syntactic domain of the phonological word (single main stress in English) cannot exceed $X^0/X^{min}$ because the complete word, by assumption a terminal, is inserted as an atomic syntactic terminal.

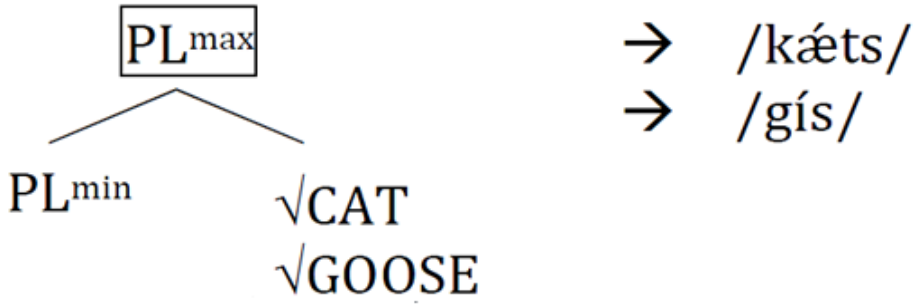
48. cat → $cats_{PL}$

    goose → $geese_{PL}$

- $cats_{PL}$ and $geese_{PL}$ are inserted (=project) as a complex terminal N. The feature PL of N is syntactically active, and must be checked against the emerging syntactic structure to ensure compatibility (see Chomsky 1995, i.a. for an articulation).

- If, however, PF is available to the output of the syntactic derivations, we expect larger constituents as single phonological words.[6]

49.




(Note that √CAT and √GOOSE are 'nominalized' in (49) by being complements of PL, a member of the nominal extended projection. Similarly, in (50b) below, √RECITE is 'verbalized' by being a complement of a V-selecting N, N[V], realized as *-al* in the context of √RECITE)

6

## 6 Research Agenda:

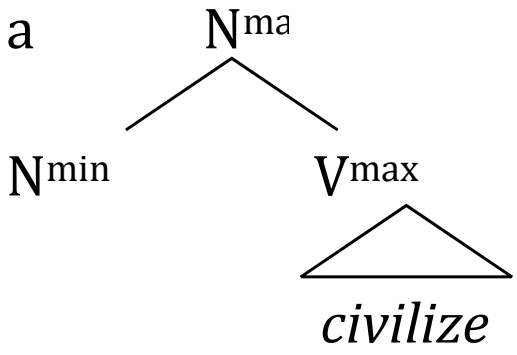
- Abstract grammatical formatives/features (e.g. PL) with syntactic/semantic functions, and with their PF either a default (e.g. English *-ed*) or determined by the root (e.g. English irregular past tense), including zero instantiations.

- Roots as units which are syntactically inert (no category, no syntactic insertion frame). They are phonological mnemonics to information packages that control realizations in their local domains. They do not have grammatically meaningful Content, and possibly no Content of any kind altogether.

- PL (or structural equivalent) is integrated directly into the syntactic tree as an abstract grammatical terminal.
- What is pronounced is a syntactic *phrase*, not a syntactic terminal, upon consultation with the root.
- This points towards a research agenda that explores the limitations on PFs that emerge from syntactic structures, and conversely, limitations on syntactic structure that might emerge from PF.
- Similar considerations apply to derivatives, with categorial markers integrated into the syntax as abstract terminals, to be realized phonologically either as default (a) or in conjunction with the properties

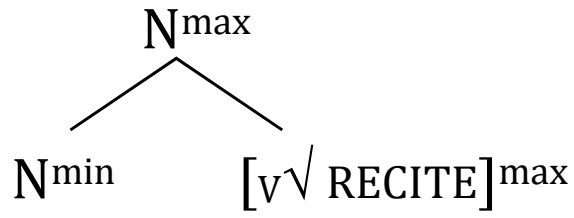
of the roots (b) (and see Borer, 2013 on *-ation* and its allomorphs as the default N categorizing affix).

50. a




→ /sìvələ̄zéʃən/ 'civilization'

b




→ /rəsájtəl/ 'recital'

- We therefore must entertain the possibility that phonological words are matched not with syntactic terminals, or some form of $X^{0/min}$, but rather

with phrasal constituents of some well-constrained size (e.g. as in Span-based approaches, see in particular Svenonius 2012 and subsequent).

# 7 Content and Syntax: The Listed Residue

## *7.1 Content matching and its domain*

51. *Recital:*
    a. act of RECITing
    b. SOLO CONCERT

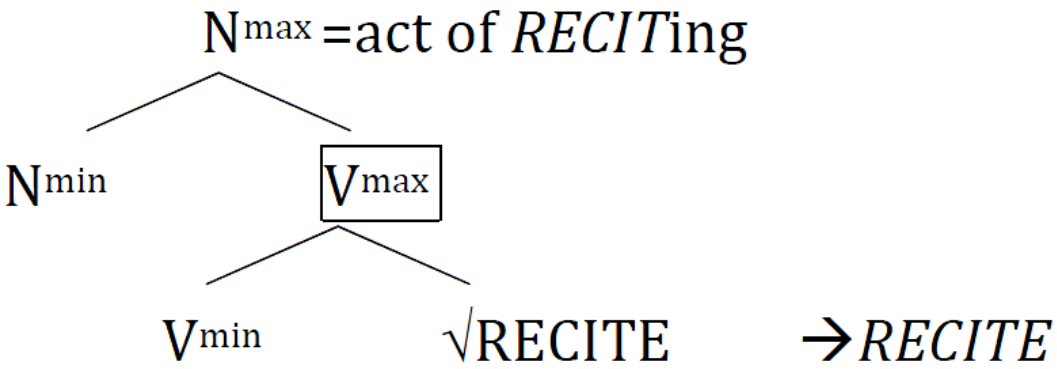
52. *Civilize:*
    a. making CIVIL
    b. ENLIGHTEN

53. *Civilization*:

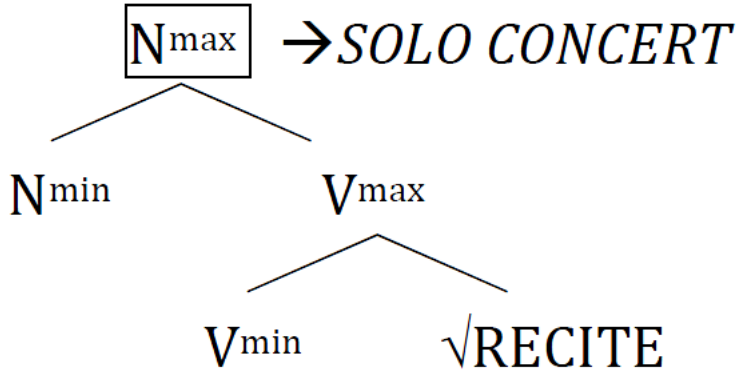
    a. act of making *CIVIL*
    b. act of *ENLIGHTENING*
    c. *SOCIETY, PEOPLE*

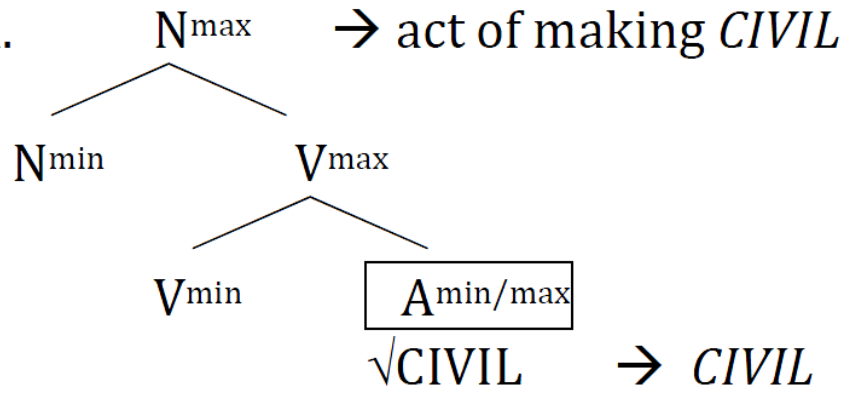
The difficulty vanishes when we dispense with Atomicity. Without Atomicity, nothing bars correspondence between listed meaning and more complex syntactic constituents.

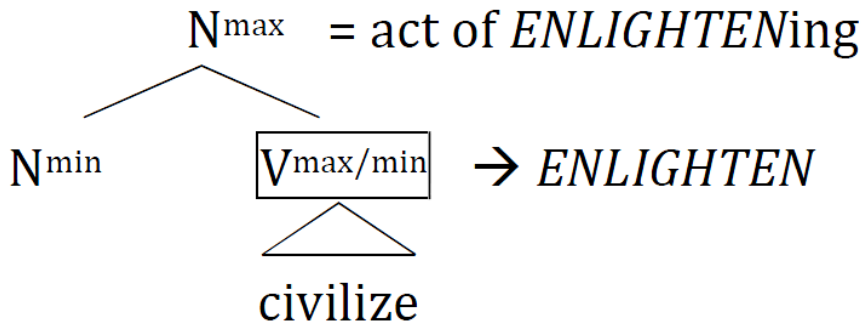
54. a.

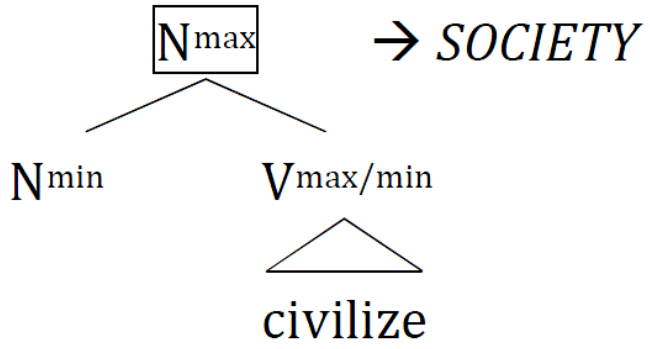

Nmax =act of *RECIT*ing
Nmin
Vmax
Vmin
√RECITE
→*RECITE*

b.


Nmax
→*SOLO CONCERT*
Nmin
Vmax
Vmin
√RECITE

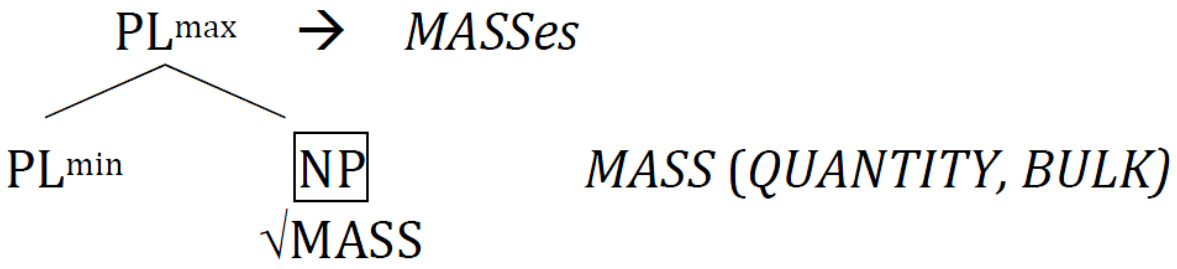
55. a. 
Nmax
→ act of making *CIVIL*
Nmin
Vmax
Vmin
Amin/max
√CIVIL
→ *CIVIL*

b. 
Nmax
= act of *ENLIGHTEN*ing
Nmin
Vmax/min
→ *ENLIGHTEN*
civilize

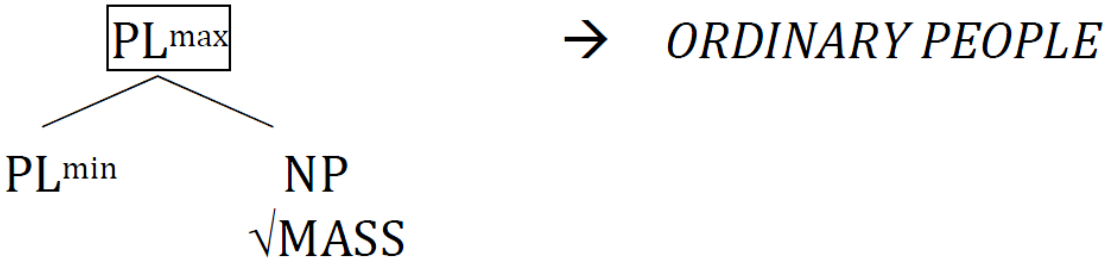
c. 


- Phrases (including trivial ones) are matched with Content (conceptual meaning) cyclically (or by Phase); but -
- Content is optional.
- Once a constituent is matched with Content, that Content cannot be changed.

56. a.




b.




What is Domain D, such that it allows non-compositional Content? E.g. It clearly allows PL$^{max'}$ but there appear to be no correlates to *pluralia tantum* with D or T?

I suggest in Borer (2013, 2014) that Domain D is delimited by a functional terminal F such that F is a sister of the C-core (the maximal domain of some non-functional categorial label C), and D includes F (*government* certainly comes to mind…).

57. [$_{\text{C-core}}$ [$_{\text{F2}}$ F2 [$_{\text{F1}}$ X F1 [$_{\text{C-core1}}$ C ]]]]

A. ***One list, one access point***
There exists a reservoir of (conceptual/conventionalized) atomic, indivisible Content units, call it the *encyclopaedia*. Mediating between the encyclopedia and grammatical representations is a search engine (*en-search*), which matches qualified bracketed (partially spelled out) constituents with encyclopedic Content units.

B. *Non-Compositional Content* (=*atomic Content*) is the output of a *single successful en-search* and is equally associated with *cat* or with with *transformation* or *naturalize*. Roots (*phonological indices),* may happen to be co-extensive with a qualifying (partially spelled out) constituent which is matched with Content, but do not, as such, have independent Content of any sort, nor do they represent a privileged domain for Content matching.

58. a. slithy, mimsy[7] b. sturdy, flimsy c. bloody, flaky
    d. bulgy, bossy

[7] *Slithy, mimsy* from Jabberwocky.

59. $[_A\ [_N\sqrt{ABC}]\ (s)y_A\ ]$ (note that both N and A are c-cores, and that the A-core contains the N core).

| 60. | ***BASE (N)*** | ***Content*** | ***Derivative*** | ***Content*** |
|---|---|---|---|---|
| | a.*slith, mim(s)* | no listed Content | *slithy, mimsy* | no listed Content |
| | b. *sturd, flim(s)* | no listed Content | *sturdy, flimsy* | *STURDY, FLIMSY* |
| | c.*bulge, boss* | *BULGE, BOSS* | *bulgy, bossy* | No listed Content |
| | d. *blood, flake* | *BLOOD, FLAKE* | *bloody, flaky* | *BLOODY, FLAKY* |

61. **Permanently Contentless:**
    a. (the) sturd(s)
    b. (will) flim(s)
    c. sturd(ed)
    d. very slithy
    e. mimsy enough!

62. a. Content matching is optional (*sturd; slithy*).
    b. Content matching is cyclical (*FLAK+y* as well as *FLAKY*).

    but ---

    c. One Content per C-core (*FLAKE* or *FLAKY* but not both).
    d. The first merging F-segment defines the upper boundary on en-searches.
    e. Content, once matched, cannot be modified or elided.

## *7.2 The domain of Content - illustrations*

63. *Diminutives*

a. *eten-tje*
food.DIM 'dinner' *Dutch*

b. *cas-ino*
house.DIM ‘brothel’ *Italian*

c. *stoł-ek*
table.DIM‘chair’ *Polish*

d. *almofad-inha*
pillow.DIM 'spoiled person' *Brazilian Portugese*

(De Belder, Faust and Lampitelli, 2015; Armelin, 2014)

64. *Slavic perfective prefixes*

    a. *czytała* *prze-czytała* → *READ*-PRF
       read PRF-read

    b. *od-czytała* → *PRESENT*-PRF *roz-czytała*→ *DECODE*-PRF
       PRF-read PRF-read PRF-read (*Polish, Lazorczyk 2010*)
       *PRF*-read

65. *Cantonese classifiers:*

    a. *tienwoe* *ki* → TELEPHONE WIRE
       telephone CL-long'

    b *tienwoe* *tung*
       telephone CL-through → TELEHONE CALL

66. *Pluralia and dualia tantum*

a. glass-es, brief-s, trouser-s, scissor-s

b. *šam-ayim, ofan-ayim, mispar-ayim* *Hebrew*
???.DU wheel.DU number.DU
'sky' 'bicycle' 'scissors ???=no obvious meaning

67. [Y[Z [ PL [N glass ]] ] ]
[Y[Z [ DUAL [N mispar ]] ] ]
[Y[Z [ CL [N tienwoe ]] ] ]
[Y[Z [ PRF [V czytała ]] ] ]

See in particular Arad (2003); Borer (2013, 2014); Marantz (2013); and Harley (2014) for on-going debates on the syntactic domain of Content.

## *7.3 Move over, $X^0$– it's Phrase time!*

- Argument realization is phrase-contingent.
- Phonological realization is phrase-contingent.
- Content is phrase-contingent.

and of course:

- Movement is phrase-contingent.
- Binding is phrase-contingent.
- (Much of) formal semantics is phrase-contingent.

## 8 Final Comments on Roots, PF, and Lexical Meaning (Content)

- Roots, presumably obligatory at the bottom of every syntactic projection, and subject to (so-called) first merge are units of sound/gesture. Within this view, sound/gesture is the substance which the syntax shapes into meaningful utterances.

- The phonological properties of roots, however represented, cannot be in question. Not only do they control aspects of their own pronunciation, they also clearly control the realization of adjacent morphemes (English plural, English past tense, realization of categorial affix, etc.)

## *8.1 A though experiment:*

### *Jabberwocky*

***By Lewis Carroll***

’Twas [$_{A}$ brillig], and the [$_{A}$slithy] [$_{N}$toves]
Did [$_{V}$gyre] and [$_{V}$ gimble] in the [$_{N}$wabe]:
All [$_{A}$mimsy] were the [$_{N}$borogoves],
And the [$_{N}$mome] [$_{N}$raths] [$_{V}$outgrabe].

As is frequently noted, in the Jabberwocky experiment, all substantive items are nonce forms – they do not have meaning – by all functional items are well-formed English terms. There is no question that Jabberwocky is English (rather than some other language) and whatever meaning Jabberwocky has – and it has quite a bit – comes without Content.

Now as all substantive items are nonce and contribute little to the structure or the meaning, suppose we quite simply get rid of them. As some of them are necessary to support functional items, I have modified them, and here's the result:

68. 'Twas too [$_A$ ], and these very [$_A$ ] [$_N$ ]
Did [$_V$ ] and [$_V$ ] in the [$_N$ ] :
way too [$_A$ ] were many [$_N$ ],
but one [$_N$ ] was not.

Whatever the result is, it is not English, and I seriously doubt it could be an instance of Natural Language. Note that unlike cases of illicit ellipsis, or other illicit omissions, the anomaly of (68) cannot be attributed to non-

recoverability, as recoverability is inherently tied in to meaning, and meaning, by assumption, was eliminated from this experiment.

It thus emerges, rather paradoxically, that Content is dispensable for Natural Language to be recognized as such, but phonological representation is mandatory.

# THANK YOU!

## Further reading

On debates within the constructivist community concerning the mapping of constituent structures to PF and interpretation and properties of roots in general, see in particular:

Doron, E., ed. (2014) *On the Identity of Roots.* Theoretical Linguistics VOLUME 40:3/4

Alexiadou, A., H. Borer and F. Schaeffer, eds. (2015) *The Roots of Syntax, the Syntax of Roots.* Oxford: Oxford University Press

On my own perspective see, in particular:
Borer, H. (2013) *Taking* Form. Oxford: Oxford University Press

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