



Roots and Categories

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1. Introduction

1.1. A general outline of the system

1. There is only one computational component, call it Syntax, which is responsible for hierarchy forming and constituent manipulation operations in the grammar. These include such operations when they are associated with word-internal structure (and specifically, for our purposes, operations which create complex word derivatives such as *trans-form-ation-al* or *kitchen towel rack* (i.e., operations of so called derivational morphology).
 2. A substantive *Word*, as conventionally conceived, is a syntactic constituent which (happens) to correspond to a phonological unit of a given size (e.g., for the assignment of primary stress). While it is likely that there are some universal constraints on what syntactic constituents can correspond to such phonological units, beyond that, the mapping is language specific, and syntactic constituents of equal complexity may or may not be phonological-stress units. Crucially, then, substantive *Words* are not syntactic primitives or atomic in any meaningful sense.
 3. Roots (*listemes*, in Borer (2005a,b) do not have any internal grammatical structure, and are devoid of any syntactic value:
 - a. No category
 - b. No morphological marking
 - c. **No argument structure (either external or internal).**
 4. Roots need not correspond to well-formed phonological words.
 5. Grammatical Functors (both F_L and F_F) are members of the Functor Lexicon (=vocabulary items in DM).
 - a. F_F : a grammatical functor that projects and licenses a functional node: *the*_D, *three*_#, *will*_T, <pst>_T, <pl>_{DIV} etc.)
 - b. F_L : a grammatical functor that projects a lexical node: *-al*_A, *-ation*_N, *-ize*_V, *-ly*_{Adv}, *on*_P
 6. English derivational suffixes, instances of F_L , merge syntactically with their semantic (functorial) and syntactic properties. At times, such a bundle of syntactic and functorial properties defines a unique affix in a language, e.g., English *-{i/a}ble*, with the result that whether or not it is inserted with a phonological index or not is immaterial. At other times, such a bundle defines a set of morphemic allomorphs (e.g. deverbal nominals of the *{-ation}* class): *-ation/-ion*, *-ment*, *-ance/ence*, *-al*.
 7. Extended Projections must have an L core (definitionally).
 8. Roots merge as phonological indices. Phonological indices are exactly specific enough to ensure phonological faithfulness in the syntactic derivation, thereby excluding the derivation of *show* from *see* or an event-denoting noun such as *lesson* from some abstract non-existing verbal entry. A complete phonological matrix for a root is inserted on the basis of the index in the syntactic context created by the derivation.
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9. **Roots merge with functors (F_L or F_F), and are categorized contextually by their merger environment. Consequently, bare roots, without a category label, are not a syntactic option.**
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10. *English does not have (productive) \emptyset -F_Ls (zero n, v, a etc. as categorizers¹).*

11. *Roots merge without meaning.*

- b. All non-compositional substantive meaning (henceforth Meaning), including that of roots, is assigned by a single component, henceforth the encyclopedia.*
- c. The encyclopedia searches (en-searches) post-syntactic bracketed phonological representations and returns Meaning.*
- d. En-searches are cyclic and local: F_F brackets delimit en-searching (and note – this means that the first F_F, element, e.g. plural marking as well as aspectual heads may be included in en-searching).*

1.2. Some entailments and consequences

- 12. a. If root meaning is only available on the basis of phonological representations, it follows that it is syntactically inactive (including in Logical Form). It further follows that roots cannot have internal arguments (i.e. (3c) follows from (11)).
- b. Silent copies are not assigned encyclopedic meaning. It therefore follows that for any one given derivation, non-compositional derivatives need not be ambiguous.
- c. Identical syntactic derivations with distinct, multiple phonological spellout possibilities for F_L vocabulary items may result in Meaning differences.
- d. All grammatically active material must be encoded either structurally or through the properties of functional vocabulary
- e. Non-local non-compositional Meaning assignment (e.g. phrasal idioms) requires multiple, possibly templatically-linked *en-searches*.

1.3. In this workshop:

13. **What I will mostly talk about:**

- a. Arguments for post-syntactic non-compositional substantive meaning assignment
- b. Arguments for the sensitivity of non-compositional meaning to phonological representation
- c. Arguments that en-searches are stopped by F_L brackets.

14. **What else is in this Handout:**

- a. Evidence that Roots must be inserted with a phonological index.
- b. Arguments for contextual categorization and against zero F_L

2. One simple argument for (some) early root phonology (cf. Borer 2003)

- 15. a. $\sqrt{\text{EAT}} \rightarrow /eat/$
b. [_v CAUSE $\sqrt{\text{EAT}}$] $\rightarrow /feed/$
- 16. AS-nominals (Grimshaw's 1990 Complex Event Nominals) are nominalizations of a verbal structure (Hazout, 1991, 1995; Borer 1993, 1999, 2003; Engelhardt, 2000; Alexiadou, 2007; Harley 2006; Sichel 2007 among others, differing executions immaterial here.)
- 17. There are no AS-nominals in English (Hebrew, Greek) whose head is not morphologically (transparently) derived from a verb (or adjective).²

¹ To be distinguished from, e.g. v as an event-structure node, which the present claim is silent about.

² With English *aggression* being an exception that clearly proves the rule.



is assigned, it is carried along throughout the derivation” (Arad 2003, based on Marantz 2000, 2001).

→note conceptual affinity with Lexical Phonology and Morphology where meaning changes are restricted to level I affixation, which, by definition, is 'inside' level II affixation which cannot change meaning).

- 28. a. A root inventory with basic meaning
- b. A mechanism allowing the assignment of non-compositional meaning in a restricted syntactic environment (for Arad, op. cit: at categorizing, possibly defining a phase).
- 29. Pairs such as *transmission* (the act of transmitting) vs. *transmission* (car gear), have distinct structures (cf. Embick and Marantz 2008):

 - a. [[$\sqrt{\text{transmit}}$] \emptyset_v]-tion_n b. [[$\sqrt{\text{transmit}}$] -tion_n]

3.2.1. Some general queries:

- 30. What is the status, in this system, of the 'basic meaning of roots'?
 - a. If they do have a basic meaning, is it reanalyzed when the root+category combination is assigned a distinct meaning (e.g., *transmission*)?
 - b. If they don't have a basic meaning altogether, what does it mean to claim that roots take internal arguments?
- 31. Whenever F_L attaches to an uncategorized root, it only does so providing in some (parallel) derivation that root is categorized as a specific category type, and with a zero F_L. (e.g., whenever *-tion* attaches to a root to give rise to a 'non-compositional' meaning, it can also attach to that same root, providing it has been verbalized with a \emptyset -F_L). That is a rather curious coincidence.

3.2.2. Empirical problems

- 32. Arad’s (2003) evidence: Hebrew verbs derived from roots may have idiosyncratic meanings. Denominal verbs have predictable meanings.
- 33. a. Root: X.Š.B (roughly cognitive process) → [_N *xešbon*] → [_V *hitxašben*]

'arithmetic'	'settle accounts'	
'account'	'retaliate'	
'calculus'		(Arad, op cit), .

→ But Hebrew *xešbon* 'account', does not have the 'settle account/retaliate' reading (e.g. with any light verb)! This may be literally translated from the English idiom, rather than derived from the Hebrew noun.⁴
- b. Underived noun: [_N *bayit*] → [_V *biyet*]

'house' ⁵	→	'domesticate'
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→ but also: [_V *hitbayet*]

'focus in on something'

Again may be a literal translation from English 'home in on', but the noun *bayit* 'house' is impossible in that meaning context (e.g., no 'homing pigeons'-type of expression).
- 34. [[_Vtrans[form]]-ation]

[_N [_N [_V re[act]] tion] ary]]
[_N [_A [glob] al] ize]-ation]

⁴ ose (li/iti) *xešbon*(ot), lit. 'makes (to me/with me) account' means 'keep record of wrongdoings', not 'retaliate'
⁵ See Bat El (1994) inter alia for extensive argumentation that *bayit* 'house' is not derived from a root.



- [_N[_V[_A[_Nnatur]al]iz]ation] (H. Harley, p.c.)
- [_N [_V [organ] ize] ation]
- [_N[_A[act] ive] ism/ist]
- [_N[_N[_Vprotect]ion]ism]
- [_N[_A[_Vexist]ent]ial]ism]
- [_A[_V[differ]ent]ial] (math)
- [_N[_A[_Nfest]iv]al]
- [_A[_N[_Vexcept]ion]al] (excellent), [_{un}[_A[_N[_Vexcept]ion]al]] (ordinary)
- [_{un}-[_A[_(N)Americ]an]]

3.3. An Alternative

35. One list, one access point

- a. No initial assignment of root meaning
- b. No meaning adjustments at any syntactic intermediate point
- c. An encyclopedia that matches Meaning with Sound (=phonological representations) in a restricted domain (see also Marantz, 1996). Within that domain, the arbitrariness of meaning assigned to, e.g., *form* or *pie* is no different from that assigned to *reactionary* or to *last judgment* and *fellow traveler*.

36. What domain? A clue from derived nominals:

Both R-nominals and AS-nominals are derived from verbs (Borer, 1999, 2003; Alexiadou, 2007) through incorporation. In both cases, the incorporation creates string adjacency between V and its nominalizer:

- a. R-nominals: [_N [verb] N [_{L=V} verb]
- b. AS-nominals: [_N [verb] N [_{FF1..} [_{FF2...} [_{L=V} verb]]]

- 37. a. [[*form*_{L=V}] -*ation*_N] a possible single phonological word; possibly non-compositional
- b. [[[[*form*_{L=V}]_{FF2}]_{FF1}] -*ation*_N] a possible single phonological word; must be compositional

38. A locality constraint on en-searches:

- a. *En-searches* match Meaning with sound cyclically, using L as an anchor and operating on bracketed strings.
- b. F_F stops *en-searches* (differently put, encyclopedic entries may not contain F_F.)

39. Some consequences and elucidations:

- a. Reanalysis of root meaning is never necessary
- b. As silent copies are not *en-searchable*; if an *en-searchable* domain was formed by movement (e.g. incorporation), there is no reconstruction and compositional meaning is *not* formed alongside a compositional one for any single derivation.

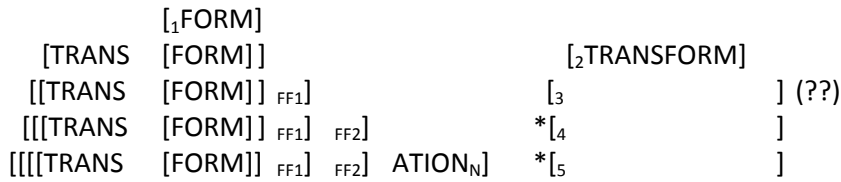
- 40. [₁ACT] .
- [RE [ACT]] [₂ REACT]
- [[RE [ACT]] TION] [₃ REACTION]
- [[[RE [ACT]] TION] ARY]; [₄ REACTIONARY]

(Single) *en-searchable* domains: [₁ACT], [₂ REACT], [₃ REACTION], [₄ REACTIONARY]

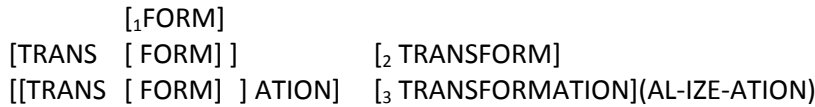
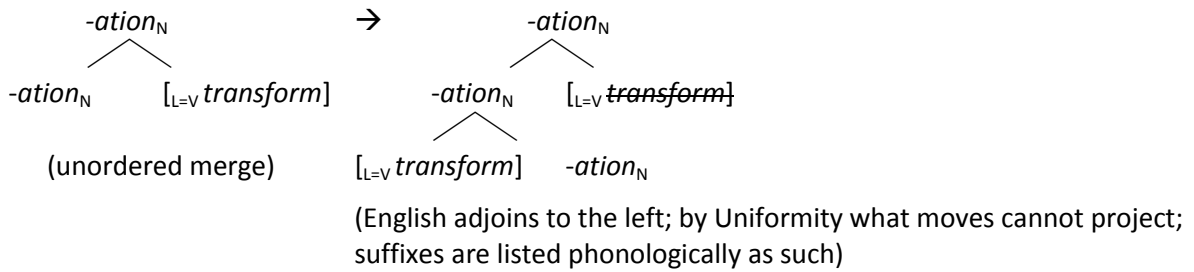
Compositional readings: all single *en-searchable* domains *plus* the inherent meaning of any F_L within a given cycle.



41. *The linguist's transformation of the structure



42. A successful grammatical transformation



- 43. a. Only non-compositional constructs in Hebrew are systematically consistent with the grammatical properties of incorporated structures
- b. Only non-compositional constructs can head another construct (i.e., create a left branching structure).

Non-compositional Meaning requires incorporation thereby creating an en-searchable domain (cf. Borer, 2008)

44. [*beyt-sefer*] sade; [*begged-yam*] meši; [*yošev-roš*] mo'aca [*yom huledet*] šlošim⁶
house book field suit sea silk sitter head council day birth thirty
'field school' 'silk bathing suit' 'council chairman' '30th birthday'

45. **[beyt 'ec]* sade; **[xulcat (ha-)mora]* meši;
house wood field blouse (the-)teacher silk
(field wooden house) (silken teacher's blouse)

46. A very simplified structures for construct and compounds in Hebrew:

a. [_{DP} [_{#P} *beyt* [_{FF} [_{DP} *mora*]]] *beyt* [_{DIVP} *beyt* [_{NP} *beyt*]]

house teacher 'a teacher's house'

b. [_{DP} [_{#P} *beyt* [_{FF} [_{NP} 'ec]]] *beyt* [_{DIVP} *beyt* [_{NP} *beyt*]]

house wood 'a wood house'

47. [_{DP} [_{#P} [_{NP} *beyt* [_{NP} *sefer*]]] [_{FF} [_{NP} *sefer*]] [_{DIVP} *beyt* [_{NP} *beyt*]]

house book book (right adjunction) 'school'

⁶ Cf. *šnat alpayim* 'year 2000', where the feminine form *šana* 'year' takes a construct form, for evidence that numerical of this sort require a construct formation.



48. And note, as well: *begged*, 'suit' 'clothing item' is already categorized (as N, by the vowel combination); *yošev*, a participle, 'sitter', is already categorized. Yet they give rise, in compounding, to non-compositional meaning, in turn associated with a single N dominating constituent.

3.4. Evidence or phonological representations feeding the encyclopedia

49. a. The selective **transmission of historical documents**
b. scanning and **transmittal of documents** or parts of **documents** (US Patent office publication)
c. A camera system for processing documents for measurement of reflectance and/or **transmittance of documents**
50. a. **Deferment** of student loans
b. The department shall grant a **deferral of** interest and principal payments
51. a. Several groups ... monitor the sale and **transportation of seed**
b. "The **transportal of seeds** in the wool or fur of quadrupeds." –a C. Darwin article
52. a. the slight **transference of** red pigments from the skins
b. "**Transferral** of bread "sponge" from dough mixer to trough prior to fermentation"
53. a. public transportation
b. *public transportal
54. a. the car's transmission
b. *the car's transmittal
c. *the car's transmittance
55. a. "Understanding transference and counter transference"
b. *Understanding transferral and counter transferral

4. Some consequences and some open issues:

56. Plural inflection does not block non-compositional reading – no F_F bracket between plural and N:
a. **pluralia tantum**: *scissors, glasses, trousers, pants, news* etc. (typologically very common)
b. **but also**: compounds with plurals including non-compositional, in which the [D_{IV}] bracket is inside the non-compositional domain.
57. Phrasal idioms cannot be the output of a single en-search. Speculatively, the encyclopedic entry for *cross* will activate a lookahead en-search for *bridge*, the entry for *bridge* will activate a lookahead en-search etc. (and see Harley and Noyer, 2000 for an explicit suggestion along somewhat similar lines). Likewise, *coat of arms*, *kick the bucket* and similar cases must involve multi en-searches
58. a. I hammered the nail in with my sandal (derived from root, hence flexible)
b. I painted the wall with lacquer
59. a. *I taped the picture with pushpins (derived from word, and hence rigid)
b. *I lacquered the wall with paint
(argument in Arad, 2003, based on Kiparsky 1997)
60. a. Lola taped the poster to the wall with band aids/mailling labels
b. screw the fixture on the wall with nails Kiparsky, 1982) – ok if nails are twisted to affix the fixture (Harley and Haugen, 2007)
61. Bento boxes of the week: Lacquered with bitter persimmon juice (Google search)



62. a. I taped the picture with a ??(duct) tape
b. I hammered in the nails with a ??(big) hammer (Harley and Haugen, 2007)

5. Synthetic Compounds - the Conundrums

63. a. If compounds are en-searchable and may return a non-compositional meaning, they cannot (*when non-compositional, at the very least*) be derived from structures containing F_F .
b. Synthetic compounds (or things that look an awful lot like them) most certainly can be non-compositional: *crystal-gazing, card carrying, line producing; globe trotting, sharp shooting, head hunting, face lifting, shop lifting, sleep walking, home making, war mongering*
c. A conundrum for some models (Borer, 1999, 2003, 2005; Alexiadou 2007, Sichel, 2007): if internal arguments come from event structure, then the(apparent) internal argument in synthetic compounds must come from functional event structure. But synthetic compounds do not have an event interpretation (cf. (64)-(65)). So where does the internal argument interpretation come from?
d. A conundrum for the present proposal – if internal arguments come from functional event structure, how can synthetic compounds have a non-compositional meaning?
e. Another conundrum for some models (Marantz, 1997; Alexiadou, 2007): if *-ing*, in derived nominals, triggers the projection of some particular functional structure (v , for Marantz; VoiceP for Alexiadou) which effectively forces *-ing* nominals to be AS-nominals and excludes them as R-nominals, how are synthetic compounds with *-ing* but without an event reading possible?
f. Suppose internal arguments are properties of roots, and not of structure (Marantz, 1997, Harley, 2006, 2008). A number of prima facie conundrum nevertheless arises: first, if roots have an internal argument (in which case, note, they do have meaning), where does it disappear to in R-nominals? And wouldn't having an argument mean, effectively, that the root is a verb? (cf. Acquaviva, 2008). Second, derived verbs have internal arguments (e.g. *verbalize*), which could hardly come from the root. But if internal arguments are licensed structurally for *verbalize*, why can't they be licensed structurally across the board without root-related information?
64. a. The breaking of the door by Mary in seven minutes in order to collect the insurance
b. (I watched) the door breaking (*by Mary) (*in seven minutes) (*in order to collect the insurance)
65. The breaker of the door (*in seven minutes) (*in order to collect the insurance)

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