10.1 Directionality: The issue in context

The Derivational Cycle (=Base Priority) as a theory of morpho-phonological interaction.

Morphological relatedness may override the phonology (over/under-application) but in a very constrained manner:

(1) A morphologically derived word (can) inherit phonological properties from its base.
   clear → clarify → clarification
   TSL applies in clarify and is carried over into clarification
   (The hypotheses of Cyclic & Late Lexical Insertion provide for a very specifically delineated application of outwards sensitivity, but only for grammatically-conditioned allomorphy.)

(2) Cycle ∈ Local Determination:
   To deduce the surface form of a word, it is sufficient to know:
   i. The constituent pieces of that word (abstract morphemes).
   ii. Their morphological arrangement / hierarchical structure (recursion).
   iii. The phonology of the language.

   (Possibly even more local: sisterhood/percolation; phases/domains; …)

10.2 The OP Challenge (McCarthy 2005)

(3) OP:

   “[In]flectional paradigms are different from derivational hierarchies; in paradigms, all members are co-equal in their potential to influence the surface phonology of other members of the paradigm.” (OP: 174)

   The surface form of a word is not locally determinable, in addition to (2), one must also know:

   iv. The phonological characteristics of all other members of W’s paradigm.

   (In other words: in order to know the phonological form of STEM+Aff₁…Affₙ, you must also know the phonological form of STEM+Aff₁…Affₙ, where Aff₁…Affₙ are the other inflectional affixes that stem could have combined with.)

   Bibliographic note: contrast Burzio, Steriade etc., for whom “paradigm” means: “a set of words sharing a morpheme… or a set of phrases sharing a word.” (Steriade 1999).

   The empirical basis of OP:

   (4) Classical Arabic Morpheme Structure Constraints (MSCs) (the basic case)

   The Template of Templates (for Verbs)

   \[
   \begin{align*}
   \text{CV} & \quad \text{CC} \quad \text{CVC} \\
   \text{CVC} & \quad \text{CV} \\
   \end{align*}
   \]

   (5) a. Verb stem-templates must end in CVC
      Noun stem-templates are not so constrained
   b. Noun-inflection is uniquely vowel-initial suffixes: V…
      Verb-inflection is mixed: {V…, -C…}

   McCarthy’s suggestion:

   (6) The properties in (5a) are a consequence of the properties in (5b).

   N-V asymmetries in phonology (MSCs) are to be derived from contingent facts about nouns and verbs, in particular their associated inflectional morphology.

   (7) Even in a form like: \textit{katab-a} ‘wrote-3sg.m’
      although surface phonology would allow: \textit{kab-}\textit{a}
      the templatic form of the stem CVCVC is forced
      (more precisely *CVC is blocked)
      because that same template must also combine with \textit{–ti} \textit{katab-}\textit{t} 2sg.fem
      (and *CCC: \textit{kab-ti})

   (8) Indirectly, the phonological effect of the consonant-initial suffixes (prohibiting CC) stems carries over to those stems even when they do not combine with a C-initial suffix.

   (9) Nouns have only V-initial suffixes, hence are not subject to this effect.

   • This constitutes the argument that local determination (2) is insufficient; the key point is that the phonological influence runs from inflected forms to the stems contained in them and is thus not storable via the “derived from” relationship.

10.3 Background: Paradigms

Derivation: derives new words
Inflection: differences \textit{in the form of a word} to fit a syntactic context

\begin{align*}
\text{stand} & \quad \text{understand} \\
\text{stand, stands, stood} & \quad \text{derivation; change in meaning; “different verb”} \\
\text{inflection: changes in form for syntactic contexts (3sg, past)} & \quad \text{etc.}
\end{align*}
10
Paradigm: traditional notion (contrast BP); from *OED.

“(A pattern or table showing) all the inflected forms of a particular verb, noun, or
adjective, serving as a model for other words of the same conjugation or declension”

11
Features define a “paradigm space”

12
Italian adj / nouns (some)—Gender (2) × Numbers (2), no Case = 4 cells

<table>
<thead>
<tr>
<th></th>
<th>m</th>
<th>pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td>r_ao</td>
<td>r_ap</td>
</tr>
<tr>
<td>f</td>
<td>r_ao</td>
<td>r_ap</td>
</tr>
</tbody>
</table>

13
Features / Values: Person: {1,2,3} (derived from: [aSpk, aHeard])
Number: [aPl] Tense: [aPast] (aParticiple)

14
EXoNENTS/VoCAB. ITEMS:
- /d/  ⇔  PAST
- /j/  ⇔  “3” SG
∅  =  <elsewhere>

15
English verbs—3 persons, two numbers, two simple tenses + participles

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 psn</td>
<td>play</td>
<td>play-ed</td>
</tr>
<tr>
<td>2 psn</td>
<td>play</td>
<td>play-ed</td>
</tr>
<tr>
<td>3 psn</td>
<td>play-s</td>
<td>play-ed</td>
</tr>
</tbody>
</table>

16
Does knowledge of language (grammar) include paradigms (or paradigm structures)?
[i.e., above and beyond constituent morphemes & rules / constraints for combining them]

17
“[W]hen there are multiple related paradigms, there will be one instantiated paradigm,
and all others will have its syncere structure, and perhaps some more. But no other
related paradigm will have a contrary syncere structure, making distinctions where that
one does not. We will call that one paradigm the basic paradigm.” (Williams 1994:27)

18
Falsified by Russian (among others). No noun (pronoun, adj) marks all case distinctions.

Outline:
- Why OP would be an argument for paradigms, as such.
- The key argument for paradigmaticity in OP is incomplete, as against a cyclic/Base-
Prioritizing alternative.
- General contention: it is implausible that paradigms, as OP uses the notion, is a relevant
unit of grammatical analysis (and thus for OP effects).

10.4 The case for OP

18
Two Noun-Verb Asymmetries:

a. Noun stem-templates may end in a cluster: CC]
Verb stem-templates may not: *CC]

b. Nouns cannot begin with a cluster (no prefixes)
verbs can
except: de- verbal nouns can begin with a cluster.

19
General Phonological Constraint: no superheavy (tri-moraic) syllables
*CC], etc. (except ___)

20
Suffixed inflection

5
Suffixed inflection of Classical Arabic noun

<table>
<thead>
<tr>
<th>Singular</th>
<th>plural</th>
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<tbody>
<tr>
<td>-‘anum</td>
<td>-‘anum</td>
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<tr>
<td>-‘a’</td>
<td>-‘a’</td>
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</tbody>
</table>

4
Stem-affixing Inductions in the Classical Arabic Verb

6
Stem-affixing Inductions in the Classical Arabic Verb

a. Perfective

DuAl

<table>
<thead>
<tr>
<th>Singular</th>
<th>plural</th>
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<tbody>
<tr>
<td>-‘anum</td>
<td>-‘anum</td>
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<tr>
<td>-‘a’</td>
<td>-‘a’</td>
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</table>

3
Stem-affixing Inductions in the Classical Arabic Verb

b. Imperfective

Plural

<table>
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<th>plural</th>
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<tbody>
<tr>
<td>-‘anum</td>
<td>-‘anum</td>
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<tr>
<td>-‘a’</td>
<td>-‘a’</td>
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</table>

2
Stem-affixing Inductions in the Classical Arabic Verb

Voc. affixes

<table>
<thead>
<tr>
<th>Singular</th>
<th>plural</th>
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<tbody>
<tr>
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<td>-‘anum</td>
</tr>
<tr>
<td>-‘a’</td>
<td>-‘a’</td>
</tr>
</tbody>
</table>

1
Stem-affixing Inductions in the Classical Arabic Verb

<fa’ala, fa’alati

10 Faith OK, Phonology OK

b. Verb, template CVC: /fa’ala/ + -a, + -i

<fa’ala, fa’alati

Phonology OK; note surface allomorphy of stem

Since all constraints are viable, one of these two should be optimal.
But Classical Arabic has no such alternating forms.

ii. <fa’ala, fa’alati

Phonotactics OK; No stem allomorphy
Proposed explanation: shortening in closed syllable is required (*trimoraic)
OP-Faith: No stem allomorphy
Forces overapplication (shortening) in open syllable
but…
The entire paradigm of CVCV:C is now indistinguishable from CVCVC!

(22) Since /CVCVC/ and /CVCV:C/ never alternate (absolute neutralization)
there is no motivation for the learner ever to posit a UR distinct from surface CVCVC
Conclusion: CVCV:C is unusable (for verbs)

Stampean occultation; cf. Kiparsky’s Alternation Condition

(23) Knowing the form of the 3 masc sg requires direct reference to the other forms in the
paradigm. The base/root/stem inherits phonological properties (short V) from a derived
form. Anti-cyclic.

10.5 A cyclic alternative?

If the stem (prior to suffixation) is evaluated with respect to *\( \mu \mu \mu \), the simplification and
neutralization effects will follow straightforwardly:

(24) …CVC …CV:C Cycle I
…CVC] …CVC Closed syllable shortening (*\( \mu \mu \mu \))
…CVC] + suffix …CVC] + suffix

Hypothesis: syllabification in nouns is non-cyclic, in verbs, it is cyclic.

Pro: Covers the same range of data.
“Con.” Requires a stipulated difference between nouns and verbs. (cf. English stress)

10.6 The importance of inflectional paradigms.

(25) Left-edge restrictions:

*\[CCV… for nouns because: *\#CC, and no prefixes in paradigm

But OK [CCV for noun IF that noun is deverbal (p. 25)

Why?

Verbs have CV- prefixes in their paradigms, (nouns have no prefixes)

Since CV-[CCV is syllabifiable, OP allows [CCV to survive throughout verbal paradigm

That deverbal nouns may retain [CCV… must follow from:

(26) Base Identity_{verbal stem} \( \Rightarrow \) OP_{noun} (subscripts for explanation only)

If OP > BI, then the OP effects that exclude initial clusters in non-derived nouns would
equally exclude these clusters in derived nouns.

If OP included derivationally related words, then nouns for which there were derived verbs
would be subject to the verb inflection restrictions.

Aside:

(27) What is the Base to which Base-Identity enforces identity?

➢ The verb stem. (note: possible problem for some OO theories, as stem ≠ word)

Derivation typically runs on stems, even when those stems are not words in their own right.)

(28) German /spraech-en ‘speak-INFN’ also be-spraech-en, ver-spraech-en, etc.

<table>
<thead>
<tr>
<th></th>
<th>present</th>
<th>past</th>
<th>participle</th>
</tr>
</thead>
<tbody>
<tr>
<td>sg.</td>
<td>sprech-e</td>
<td>sprech-en</td>
<td>sprech-t</td>
</tr>
<tr>
<td>pl.</td>
<td>sprech-e</td>
<td>sprech-en</td>
<td>sprech-t</td>
</tr>
<tr>
<td></td>
<td>sprach-st</td>
<td>sprach-t</td>
<td>sprach-t</td>
</tr>
</tbody>
</table>

Imperative: /sprich/ 

The two members of the paradigm with –O affixes both have vowel changes.

The “stem” never surfaces as a word: * sprech

But it is the verb stem (not the root, as the prefixed cases show) that is the base for compounding
and derivation:

(29) [[Be-spraech]-ung] ‘meeting, discussion’ (nominalization –ung)
[[Ver-spraech]-er] ‘slip of tongue’ (-er) < verspraech-en ‘to mis-speak’

Likewise compounding:

(31) Summary:
Derive N-V asymmetries from contingent facts about nouns and verbs, and their associated inflectional morphology.

Key points of interest:
- OP compares only members of an inflectional paradigm (outranked in derivation)
- Phonological influence runs from derived form to base.

10.7 Questioning OP: Directionality and Templates

**Important:** When McCarthy talks about “stem shape” he is really talking about the shape of a particular morpheme, the quasi-derivational template morpheme = the one that combines with a root to yield a stem (perhaps something like Marantz’s r,n).

(32) Classical Arabic ‘write’ ktb

<table>
<thead>
<tr>
<th>TEMPLATE</th>
<th>ACTIVE</th>
<th>PASSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>present (X-s)</td>
<td>CVCCVC</td>
<td>katāb</td>
</tr>
<tr>
<td>cause to X</td>
<td>CVCCVC</td>
<td>katāb</td>
</tr>
<tr>
<td>X for ea. other</td>
<td>CVVCVC</td>
<td>kattāb</td>
</tr>
<tr>
<td>make X</td>
<td>?VCCVC</td>
<td>?katāb</td>
</tr>
</tbody>
</table>

(33) ROOT + TEMPLATE = Stem

(34) katāb ‘he writes’ is minimally 3-morphic:

\[
\begin{array}{ccc}
| & k & t & b | & k & t & b | \\
| C & V & C & V & C & V & C | & “present” \text{ / } \text{conj} 1 & C & V & C & V & C | & “cause to X” \text{ / } \text{conj} 2 \\
| & \text{“active”} & u & i | & \text{“passive”} & & \\
\end{array}
\]

(36) stem + inflection: katāb-a, kattāb-a … 3sg masc. perf.  
kattāb-dī, kattāb-dīi 2sg fem. perf. etc.

(37) Even ignoring the vocalism (=voice?), inflected verb has min. 3 morphemes:

\[
\{ \{ [ \mu_1 ] \mu_2 ] \mu_3 ] \} \text{ linear order not represented } \mu_1 = \text{root; } \mu_3 = \text{inflection} \\
\{ \{ \text{ROOT} \} \text{BINARY} \} \text{ INFLECTION } \mu_2 = \text{little } r,n, \text{ etc?}
\]

Footnote 13: “This analysis, then, uses the form of the inflectional morphemes to predict properties of the stem templates.

[Lombardi’s Question] Why should the explanation go this way? That is, why stipulate the form of the inflectional morphemes and then use that to explain the stem templates, instead of stipulating the stem templates and using them to explain the inflectional morphemes?

[McCarthy’s Answer] The inflectional morphemes are a closed class and they must be listed in any case, but the stems are an open class. The grammar, then, is responsible for explaining which stem shapes are and are not permitted, but it is not responsible for explaining why the handful of noun-infections are all vowel-initial—this is just an accident.”[emphasis added –JDB]

(38) But the stems are morphologically complex (see above)

- It is the roots that are an open class, and the stems an open class only by transitivity.
- The class of stem-forming morphemes (μ2) is no more an open class than the inflectional morphemes.
- There is only a handful of noun-infections (n=8 on p.13) but there is likewise only a handful of noun-stem-forming morphemes (n=7 in Appendix B).

(39) The asymmetry that McC appeals to is not there; instead, we are dealing with two closed classes of suffixes. McC stipulates that any shape constraints on the outer class is accidental, hence learned, while shape constraints on the inner affixes are derived, but Lombardi’s question remains open: why not go the other way?.

(40) Lombardi’s (implied) alternative:

Because the (dozen or so) verb templates are what they are, both V-initial and C-initial verb-inflection suffixes are possible, but because the (handful of) noun templates include ones ending in consonant clusters: CC] the nominal inflections are restricted to V-initial suffixes.

Why does this matter?

(41) Lombardi’s alternative obviates the crucial argument for OP over cyclic/TCT theories. (40) is “asymmetric [and] base-prioritizing” (cf. OP. 4) and hence statable in TCT / cyclic terms (ultimately faithfulness to the UR of the r,n morphemes).

The key point of OP (see McCarthy’s intro) is the claim that there exist cases where correspondence is not “asymmetric [and] base-prioritizing.”

If Classical Arabic isn’t such a case, then it is not an argument for OP (and hence not an argument for paradigms).
(42) Deriving the N-V asymmetry is not a primary result of OP, and hence not an argument for it:

View 1 (OP): The N/V asymmetry at t₂ is a result of an accidental N/V asymmetry at t₂.

View 2 (Lom): The N/V asymmetry at t₃ is a result of an accidental N/V asymmetry at t₂.

The OP proposal reduces one asymmetry to another, but still leaves us with an apparently irreducible stipulated difference between nominal morphology and verbal morphology, from which the other difference(s) follow(s).

View 2 reverses the asymmetry, but still retains a stipulated accidental N/V asymmetry.

[Thus this is not a deciding factor between OP and the cyclic alternative.]

10.8 Testing the limits

(43) Thesis of Category Neutral Phonology (cf. work by Seth Cable, extending OP) \( \Downarrow \) FALSE

Phonology does not appeal to the N/V distinction. The appearance of such a distinction is the result of accidental (contingent) properties of paradigm membership.

Expectation:

When inflectional class and morphosyntactic category diverge, OP effects should track paradigm membership and not morphosyntactic category.

(44) For example, imagine a language like Arabic, but in which feminine nouns had a consonant-initial inflectional suffix, or in which intransitive verbs (but not transitives) had only vowel-initial inflection. The expectations should be clear: feminine nouns should be restricted to CVC stem templates, while intransitive verbs should not. I will argue in the remaining sections that Itelmen shows the right kinds of idiosyncratic vagaries among paradigms, but that nevertheless, the phonology neatly tracks the noun-verb divide, rather than the contingent properties that the OP intuition would lead us to expect.

Itelmen syllabification and Epenthesis

(45) ċkpač – ‘spoon’
   tšččnin – ‘you are carrying it’
   kļgzukmen – ‘they were’
   mškčen – ‘I will make them’
   sitlxp’čl – ‘with embers’
   k’ansščč – ‘boil it!’

(46) \( \emptyset \rightarrow \emptyset / \) \( \hat{C} \rightarrow \hat{\hat{y}} \rightarrow \{ {\text{somorant}} \} \hat{C} \)

(47) a. lnxm ~ lxm-n ‘sable’ sg. pl
b. spol ~ spl-ank ‘wind’ direct, locative
c. *tyzz-x?al ~ *tyzz-enk ‘road’ ablative, locative

(48) noun/verb asymmetry:

All verb stems that have a schwa in the environment described by (46) preserve that schwa even when epenthesis is not necessary.

(49) a. t-tzal-čen 1SG-give-1SG>3SG ‘I gave it.’
b. tzal-en give-2SG>3SG ‘You gave it.’ *zlen
c. t-lom-čen 1SG-kill-1SG>3PL ‘I killed them.’
d. q-lom-in 2MP-kill-2>3SG ‘Kill it!’ *qľmn

e. spol-qzu-in windy-ASP-3SG ‘It was windy.’
f. spol-in windy-3SG ‘It was windy.’ *spł-in

(50) The epenthesis rule (syllabification) is cyclic in verbs, but post-cyclic (ATB) for nouns.

(51) Present tense allomorphs: -s, -č, -sč, and -ńč.

a. t-tzuzs-s-kčen
b. leru-z-in
c. t-qzu-z-in

1SG-stand-PRES-1SG
gripe-PRES-3SG
be-ASP-PRES-3SG

‘I am standing’
‘she gripes’
‘she is’

d. t-il-šš-kčen
e. il-z-in
f. spol-z-in

1SG-drink-PRES-1SG
drink-PRES-3SG
windy-PRES-3SG

‘I am drinking’
‘he drinks’
‘it is windy’

(52) V_C (51a) V_V (51b) C_C (51d) C_V (51e)

[tyzu] [leru] [il] [il] Cy1 Root
[tyzu] + z [leru] + z [il] + z [il] + z Cy2 Present Tense
----- ---- ---- ---- ----
   [il \( \hat{\hat{z}} \) ] [il \( \hat{\hat{\hat{z}}} \) ] Epenth
[tyzu] + ki [leru z] + in [ilz z] + ki [ilz z] + in Cy3 Agr
[tyzu] s + ki ---- ---- ---- ---- Devoicing

\( t\)-tzuzs-s-kčen leru-z-in \( t\)-il-šš-kčen il-z-in \) OUTPUT
<table>
<thead>
<tr>
<th>Non-Cyclic</th>
<th>Cyclic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun</td>
<td>Verb</td>
</tr>
<tr>
<td>[spl-ank]</td>
<td>[spl-in]</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>[spl] + ank</td>
<td>[spl] + in</td>
</tr>
</tbody>
</table>

Noun inflection: -C..., -V...
Verb inflection: -C..., -V... (no relevant differences)

But:

Intransitive vs. transitive verb inflection:

- V
  - Root ('drink')
  - Cycle 1 - Tense
  - Cycle 2 - Agreement
  - Devoicing (Epenthesis N/A)
  - Output

Epenthesis throughout paradigm: the environment for epenthesis before present tense is never met on the surface. There is no source for overapplication in the intransitive paradigm.

(i) Arabic is the wrong language for revealing such effects.

Ilmen is arguably the right language, and the OP hunch is arguably disconfirmed.

### 10.9 Summary

McCarthy’s OP paper raises an extremely interesting set of questions. Among these, can N/V asymmetries in phonology be deduced from other properties of nouns and verbs as word-classes? However, the paper falls short of establishing that any model other than the cycle (aka Base Priority) is needed for describing phonological influences among morphologically related words (and of establishing a role for paradigm structure, above and beyond the pieces that make them up).