English Tri-syllabic Shortening: Some Reflections. By Luigi Burzio

If one surfs the Internet today -and we are in 2025- one finds references to the rule of 'Tri-syllabic shortening proposed by Chomsky and Halle in 1968 to deal with cases like *natural, divinity* and many others, where the vowel in the antepenultimate syllable (third from the end) is short compared with the long ones of the unaffixed stems *nAture, divIne*, etc.

Harder to come by are references to the alternative account I first gave at the LSA meeting in Chicago on January 4, 1991 (October 1990 Johns Hopkins manuscript) and then in much subsequent published work, which proves superior if correct. In that account, there are no 'rules' that re-write the structure as in the old-style Phonology, but only 'output' or surface constraints that interact by ranking, as in the Optimality Theory of Prince and Smolensky, that appeared in 1994. Thirty-four years on, let me briefly review the evidence again.

First of all, it is not a general property of English that antepenultimate syllables have short vowels: *Ivory, nIghtingale, vItamin, dInosaur,* etc. Hence the rule OVER-shoots and needs to be constrained, by stipulation, it would seem, to environments created by affixes like *-al, -ous, -ity* and others –a group that we may call 'Class 1' affixes, distinguishing them from those of Class 2, like *-less, -ness, -hood*, that behave very differently.

Secondly, the rule vastly UNDER-shoots as well. In the approach entailed by the rule, there need to be several more 'shortening' and other rules, as listed below alongside of the Tri-syllabic rule:

1.   The rule of tri-syllabic shortening: *natural*, *divínity*, *conspíracy*, etc. (cf. *nAture*, *divIne*, *conspIre*, ...)

2.   A rule of 'bi-syllabic' shortening, applying to stressed syllable in bi-syllabic, non final stress groups, as in: *ob(líga)tòry*, *de(fáma)tòry*, *(rèfu)tátion*, etc. (cf. *oblIge*, *defAme*, *rEfúte*...).

3.   A rule of shortening in unstressed position, as in: *àspirátion*, *pròvidéntial*, *prédatòry*, *glòrificátion*, etc. (cf. *aspIre*, *provIde*, *predATE*, *glorifY*, ...)

4.   A rule of 'morphological' shortening applying to specially marked words as in: *aspirant*, *confident*, *infamous*, *blasphemous*, etc. (cf. *aspIre*, *confIde*, *fAmous*, *blasphEme*, ...). Not applying to unmarked words, whence: *desIrous*, *antecEdent*, ..

5.   A rule of *-ative* shortening and destressing of *at*, applying to specially marked words, as in *génerative*, *manípulative* etc. (cf. *generAte*, *manipulAte*,...). Not applying to unmarked words, whence *innovAtive*, ...

6.   A further shortening rule for cases like *pleasant*, *southern*, *children*, etc. (cf. *plEAse*, *sOUth*, *chIld*, ...)

7.   Yet some lengthening rule is also needed, for cases like: *elizabEthan*, *adjectIval*, etc. (cf. *elizabeth*, *adjective* ...). This rule would -like the one in (4)- need to apply only to some items and not to others, given the short vowel and the re-stressing of: *hercúlean*, *caríbbean* (cf. *hércules*, *cárib*) although stress preserving *càribbÉan*, *hèrculÉan*, with

long vowels are also attested.

To a practitioner of rule-based phonology, this may just seem business as usual, but to a neutral observer, the dazzling array of shortening rules just raises the obvious question: 'When is it that vowels DO NOT shorten?'. It turns out the obvious question has a simple answer:

'In the context of Class 1 affixes, vowels are ALWAYS short UNLESS a long vowel is needed to maintain the stress'. Hence, there is only ONE case to deal with, not SEVEN!

So, in non-shortening *desírous*, the vowel is long because English penultimate stress requires a 'heavy' syllable (i.e. a syllable ending in a consonant or a long vowel), just as in *a.ri.zÓ.na* or *a.gén.da*, etc. A short vowel would instead force re-stessing, as in **désirous*. Similarly, in *elìzabÉthan*, the stress of *elízabeth* is maintained as a secondary stress, thanks to the long *E* in the penultimate, while a short *e* would induce its loss as in **èlizábethan*. For surface constraints, which only see whether vowels are long or short on the surface, the two cases are the same. But for structure-changing rules, they are inescapably different: there is lengthening in one case (case 7: *elìzabÉthan*); nothing in the other (exception to case 4: *desírous*).

And as we have seen, in both cases there is variation: shortening and re-stressing in *blásphemous*, but the opposite in *desírous*. So, it would appear that the two mandates: <u>ban long vowels</u>, and <u>preserve the stress</u> compete evenly: either one can be satisfied at the expense of the other (though a finer-grained analysis might reveal additional factors at play: semantic closeness in *desire-desirous*; greater distance in *blaspheme-blasphemous*).

In any event, this view, based on the interplay of <u>ban long vowels</u>, and <u>preserve the stress</u> entails three possible situations:

i)   The two constraints conflict, hence long vowels CAN occur to preserve the stress as we have just seen for:

        Cases (4) and (7)

ii)   The two constraints DO NOT conflict because stress preservation is possible without a long vowel: then vowels will always be short, whence cases (1), (2) and (6):

         Case (1): Tri-syllabic shortening as in *divínity*, etc.

The reason is that antepenultimate stress does not require a heavy syllable, witness *a.mé.ri.ca*, etc.

          Case (2) Bi-syllabic shortening as in *ob(líga)tòry*, etc.

The reason here is that, unlike penultimates at the end of the word, penultimates in a word internal group do not require a heavy syllable, witness *ac(céle)rÀte, (àpa)(làchi)(cÓla)*, etc.

          Case (6) Other shortening as in *pleasant*, etc.

The reason in this case is that, while stressed penultimates generally need to be heavy, this is not the case when they are also initial, and maybe followed by a certain type of syllable, witness:

pheasant, peasant, tenant, parent, tavern, modern, barren, etc.

iii)   The two constraints DO NOT conflict because Stress Preservation is impossible in any event: then vowels will -again- always be short, whence:

Case (3) Shortening in unstressed position, as in *dèfamátion*, *prédatòry*, etc.

The reason for this is that English does not allow adjacent stresses, hence given the affix stress, stress preservation has no recourse.

Note that, so far, there is no commitment to any particular theory of stress, only to the factual generalization of word-stress in English. The special 'rules' make no connection to these independent facts. It is an accident for each of the rules that they produce structures that meet the same canons as structures to which no particular rule has applied.

This still leaves out:

Case (5) A rule of *-ative* shortening and de-stressing of *at*, as in *génerative*, etc.

Here it would seem that the rule does produce new structures, as *gé.ne.ra.tive* has pre-antepenultimate stress, not possible in English at large, by operating on a presumed regular *'géneràtive'* and de-stressing *at* to achieve the exceptional pattern. But an endorsement of such analysis would be wildly premature.

First of all, the syllable *ive* exhibits some exceptionality independently of the presence of *at*. In *súb.stan.tive* (attested alongside of *sub.stán.tive*) and *ád.jec.tive* (cf. *ob.jéc.tive*) the heavy penultimate is skipped as if *ive* did not count and the 'penultimate' was the effective ultima in the counting. This possibility would then reduce *génerative* to a regular case of antepenultimate stress (again, like *a.mé.ri.ca*) under the grouping *(gé.ne.ra)tive*. The short vowel of *at* would then be effectively a case of (3): in unstressed position, since English stress groups bear the stress only on their leftmost syllable ('trochaic' rhythm).

Secondly, this exceptional behavior is attested with a small class of other syllables, witness *ác.cu.ra.cy*, *vé.ge.ta.ble*, *tém.pe.ra.ture*, British *áu.di.to.ry* (Am. *áuditòry*), etc., all of which have apparent pre-antepenultimate stress, like *gé.ne.ra.tive*; and *áu.top.sy*, *ám.nes.ty*, *cár.pen.ter*, etc., all of which fail to stress a heavy penultimate, just like *ád.jec.tive*.

This classification of *ive* with these other syllable, all of which have -perhaps- a low level of sonority (syllabic sonorants [əl], [ər]; high wowel [i]), is supported be the fact that they have other properties in common:
     When these syllables are NOT skipped and they are part of a binary group, they give rise to only secondary, rather than primary stresses if another group precedes, as in: *méditàtive* (cf. *mèditátion*), *législàture* (cf. *lègislátion*), *állegòry* (cf. *àllegátion*), *álligàtor* (cf. *àllegóric*), the variant *pólyèster* (cf. *pòlytécnic*), *púmpernìckel* (cf. -maybe- *psỳchiátric*).

In this line of work, I proposed that this group of 'weak' word-final syllables has one more member: syllables that have no vowel or overt nucleus at all but consist only of a single consonant with its acoustic release or other sonority (German linguist Heinz Giegerich and

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British John Harris had both preceded me on this claim). This hypothesis solves two important puzzles: i) apparent 'super-heavy' syllables occurring only in word-final position; ii) the apparent exceptional stress of verbs and other items. So, in *decIde*, or *prevent*, the sequences *cI* and *ven* each constitute a heavy syllable –the already maximal syllable in general. But now, if their ends *d* and *t* constitute a further syllable, then there are no super-heavies word finally, but only weak syllables –a class independently attested. If such syllables enter into the stress count for verbs, then *de.cí.de*, *pre.vén.t* have regular stress like *a.ri.zÓ.na* and *a.gén.da*: on a heavy penultimate, while verbs like *in.há.bi.t*, *en.vé.lo.p* have regular antepenultimate stress with a light penultimate, again like *a.mé.ri.ca*. Nouns do not in general count such syllables, whence the noun *én.ve.lo.pe* compared with the verb, and the many noun/verb contrasting doublets, as with *discount*, *conduct*, *record*, *subject*, *reject*, *suspect*, *conflict*,...(but note, e.g. *de.sí.re* with the same stress as a noun or verb, and verb-like stress with some adjectives, like *di.ví.ne*, *ro.bús.t*, ...). Adjectives in *-ic* behave generally like verbs. E.g. *barbáric* parallels *inhábit*, compared with expected *bárbarous*. This would follow if the final consonant of *-ic* was counted as a syllable, as with verbs. Then *bar.bá.ri.c* would -again- have regular antepenultimate stress. This correctly predicts 'tri-syllabic shortening' with adjectives in *-ic*, as in *volcánic* (*volcAno*), *tónic* (*tOne*), *phonétic* (*phonEme*), etc., as stressed antepenultimates do not need to be heavy (*américa*). The likely reason for the counting of weak syllables with both verbs and *-ic* adjectives is 'paradigmatic' consistency. Verbs have regularly stressed variants like *prevénting*, *inhábiting*. Counting the weak syllable of the bare verb will keep the stress consistent. Similarly, many *-ic* adjectives have regularly stressed variants in *-ical*: *académical*, etc. By counting the weak syllable, the *-ic* pattern achieves consistency with the *-ical* pattern. Without going into it, this type of stress consistency is relatable to the above Stress Preservation.

We may finally note the behavior of *-able* adjectives from verbs. These maintain the stress of the verb: *inhábitable*, *prevéntable*. The present reason is that the empty syllable of the verb is just filled in by the vowel *a*, while *ble* is itself a weak syllable and remains out. Further correct predictions ensue. With verbs like *récognìze*, *stérilìze*, *állocÀte*, *régulÀte*, we find that the weak syllable with empty nucleus (here orthographic *e*) induces a (weaker, or) 'secondary' stress on the preceding syllable, as with other weak syllables (*législàtive*), confirming that they are members of the same class. But adjectives in *-able* turn that secondary to primary: *rècognízable*, *stèrilízable*, *àllocÁtable*, *règulÁtable*. The reason is that, by filling in, the vowel *a* amends the formerly weak syllable, while the weak syllable *ble* remains itself uncounted (counting it would give, e.g., incorrect **inhabítable* and further incorrectly predict tri-syllabic shortening in *rècognízable*, etc.).

In sum, cases like *generative* are the tip of an iceberg that includes a larger class of 'weak' syllables whose properties are: i) that they can be skipped in the stress count, and ii) that, when they are not skipped, they can produce 'weaker' groupings bearing only secondary stress. A rule of *-ative* shortening would miss the whole iceberg.

We can then safely conclude that there is no rule of tri-syllabic shortening –only an interaction between a ban on long vowel and preservation of stress.

A more formal account of such interaction is fairly straightforward, but -again- one must think outside of the traditional boxes. Consider that an affix attached to a stem entails a correspondence between the stem and some other element in the lexicon. So, in the adjective *parent-al*, the stem *parent* corresponds to the noun *parent* in the lexicon. So far, this is just a neutral way to describe what it is to be an affix, like *-al*. What is not neutral is to assume that

'Correspondence' is a violable constraint, interacting with the rest of the system by rank, as opposed to being the result of some 'hard' word-formation 'rule' attaching *-al* to *parent*, to give the 'underlying' representation of traditional analyses to which rules will then apply. We know that with Class 1 affixes correspondence is massively violated. So, with *propagandist*, there is a correspondent *propaganda*, but with *antagonist*, there exists no *antagon; similarly, with *impressive* there is a correspondent *impress*, but with *compulsive* there is no *compuls –only *compel*. Such lexical idiosyncrasy (found with maybe 20% of Class 1 formations), namely information that does not conform with correspondence must -almost by definition- be entered directly into the full-fledged lexical item. We call that information 'Input' and postulate the ranking: i) Input > Corr-1 (for Class1 affixes). Absence of input information will give the correspondence of *parental*; presence of any input will override the expected correspondence, as in *antagonist* or *compulsive*. Our 'Stress Preservation', which is part of Correspondence, is also massively violated: *pa.rén.tal* has the usual obligatory stress on a heavy penultimate despite the stress of *párent*. We simply refer to the constraints that enforce the regular stress patterns as 'Stress' and postulate the ranking ii) Stress > Corr-1. Now all we need to deal with the relative scarcity of long vowels in Class 1words is to add one more member to the dominant set of constraints as in:

iii)   {Stress, Input, No Long V} > Corr-1

So, in *divinity*, Stress is satisfied, Input is satisfied (vacuously: there is none), No Long V is satisfied, but lower-ranked Corr-1 is violated relative to vowel length (though satisfied relative to stress, i.e. stress preservation). But where does No Long V come from? This is simply the standard constraint needed to ban long vowels in many languages (Italian/ Romance). Then how can English have long vowels at large, as in *divɪne*, *vɪtamin*, etc.? The reason for that is that those vowels are featured in the Input, and the ranking in:

iv)   Input > No Long V

Languages that lack long vowels altogether have the opposite ranking. In English No Long V dominates only Corr-1, hence only Class 1 words pattern like -say- Italian. Note that the long vowels in e.g. *rEsúme*, *phónEme*, *fórtifY* would not -on close analysis- appear to be stressed. Their length suffices to account for their perceptual prominence. But then a rule of shortening in unstressed position (3) would incorrectly shorten them. On the present view, they would just be from an input, under iv).

This general approach is supported by the fact that the behavior of Class 2 affixes like *-ful*, *-less*, *-ness*, *-hood* is captured by the simple re-ranking of Correspondence as in:

v)   Corr-2 > {Stress, Input, No Long V}

This accounts for the fact that, with these affixes: there is no re-stressing: *éffortless(ness)*; no idiosyncrasy as in *antagonist* or *compulsive* (*hapless*, *reckless* being perhaps the only exceptions); no shortening of vowels: *flAvorful(ness)*, *lɪkelihood*, *chɪldless(ness)*, ...

Now, to account for the residual long vowels in the Class 1 lexicon (*desɪrous*) we must slightly revise the ranking in iii) as in vi)

vi)   No Long V ≈ Corr-1-Stress (i.e. Stress Preservation)

That is to say, while we take the class of <u>Corr-1</u> constraints to be generally dominated by the <u>No Long V</u> constraint (and in particular <u>Corr-1</u> relative to vowel length) as in iii), we take <u>Corr-1</u> relative to stress, namely Stress Preservation to evenly compete with <u>No Long V</u> (a minimal re-ranking, perhaps). This will give the noted variation *desírous*/ *blásphemous* where the two constraints in vi) conflict and neither one is better than the other, hence both forms will be optimal. We take Class 1 words to be fully represented in their surface forms in the mental lexicon (there is no 'Underlying Representation' of yesteryear to which phonological rules apply). Such surface forms are 'checked' by the constraint-based grammar. In the case of *desírous* versus *blásphemous* both are found optimal and are thus validated as discussed. In general, there is no 'free' variation (*desírous*, but no **désirous*) in such cases, however. This is because the representation, while validated by the grammar, is 'set' in the mental lexicon. We may view this as a type of 'input', like that which injects idiosyncrasies, but here it would just be a 'minimal' input –to resolve the constraint-based indeterminacy, the full memory trace merging the two contributions of input and grammar.

This concludes the analysis. Unlike the multiple rules, the proposed constraints are independently motivated. Correspondence constraints are just the current interpretation of Morphology: Each affix calls for a correspondence (violable identity) between its stem and some other elements in the lexicon (of a specific type, like Noun, Adjective and so on). The ban on long vowels is what is needed in many languages (in Optimality Theory, constraints are never suppressed language-specifically, but only re-ranked). The specific ranking proposed accounts for the distribution of long vowels and is coherent with other facts, like lexical idiosyncrasy and regularities of stress. A single change in the ranking of Correspondence sheds light on the difference between Class 1 and Class 2 items. Correspondence constraints appear to shift rank as a cluster as in iii) versus v), but Stress Correspondence/ Preservation appears to break rank moving up as in vi), perhaps because stress plays a major role in perception.

This analysis has departed from traditional ones by the use of violable constraints instead of rules including for Morphology, but also by focusing on the residue of long vowels in Class 1 items rather than the bulk of short ones: the flip side of the coin. One may thus wonder whether a rule-based analysis may also benefit from looking at the flip side. The answer is negative. Reproducing the present approach in terms of rules would involve, first a global rule that shortened all vowels in Class 1 items, and then some other rule that would (re-)lengthen just the right ones as in e.g. *desɪrous* or *elizabɛthan*. The first rule would be completely ad-hoc, bearing no relation to the absence of long vowels in many languages and missing the link, captured by iii) above, with both idiosyncrasies (*compulsive*) and 'regularity' (rather than correspondence) of stress (*paréntal*) in Class 1 items. The second rule would be impossible to formulate. In order to apply correctly, this rule would have to know whether, by lengthening some vowel, the stress of the affixed word would be consistent with the stress of the stem. But the stress rule or principles cannot provide that knowledge by applying before the lengthening rule or, by finding only short vowels, they would just give the wrong results. That is to say, stress and vowel length cannot be computed serially (one before the other), but only in parallel, as in the present account.

So, while rule-based Phonology provided useful analyses over many decades, here it finds a hopeless bottleneck.

Addendum: The English Past Tense Debate

The Class 1/ Class 2 distinction discussed above is of direct relevance to the long standing (for almost 40 years now) debate on the English Past Tense. This debate originated in the mid 80's with the claim by computational psychologists D. Rumelhart and J. McClelland that a connectionist network could adequately simulate children's various stages of acquisition, initially producing correct irregulars like *went*, then regularizing them to e.g. 'goed' and then eventually returning them to correct forms like *went*.

In what might have seemed a defense of 'generative' linguistics and its use of symbolic-type rules, psychologist S. Pinker and his associates have countered that a single architecture as in a neural network cannot adequately account for the differences observed and have proposed a 'Dual Route' system in which irregulars are stored in memory directly, while regulars are formed by a rule, just adding *-ed*. While something is right about memory playing a role with the irregulars, this characterization runs afoul of established knowledge in linguistics (so much for the defense). In particular, the Class 1/ Class 2 distinction discussed above is well known from the Lexical Phonology model developed by P.Kiparsy and very influential through the 80s and early 90s, based on the ordered interleaving of phonological an morphological processes. While we are not subscribing to that account here, the factual distinction drawn in that work is well established. Now, it could not plausibly be that there is both a Class 1/ Class 2 (C1/ C2) distinction and then, in addition and just for the English Past Tense, there is a 'Dual Route' system. Surely, it is either one or the other. So, could the C1/ C2 distinction reduce to Pinker's Dual Route? The answer is NO. While there is reason to assume that C1 formations are 'partially' memorized as noted above, the Correspondence part as well as the Phonology part are crucial nonetheless. Pairs like *parent/ parental*, *divine/ divinity* result from affixation processes analogous to those of C2 items and are not to be reduced to independent memories, nor are the phonological differences in stress, vowel length etc. that are just due to the phonology. Remember that vowel shortening applies to e.g. *divinity* due to low-ranked Correspondence, but not to *vItamin*, due to higher ranked Input. If everything was just memorization, hence an 'input', there should be no difference. So, then the question is can the regular/ irregular past tense distinction be reduced to the well-established C1/ C2 distinction instead? The answer (following Kiparsky) is: YES, pretty much. 'Irregular' past tenses exhibit a combination of morphological idiosyncrasy and regular phonology typical of C1. So *keep/ kept* is just a phonologically predictable alternation, as we have seen that the maximal final sequence in English is a heavy syllable plus one consonant, as in both *kee.p* and *kep.t* as well as in *bee.p*. It is rather the supposedly regular *beeped* (pronounced *beep[t]*) that exceeds that structure. Pairs like *leave/ left*, *bereave/ bereft* exhibit the same phonological regularity in addition to the further regularity of voicing assimilation: [v] devoices to [f] next to the voiceless [t] of the affix. Assimilation works in fact with regulars as well but in the other direction: in *moved* (*mov[d]*) the affix is voiced like the preceding [v], while in *briefed* (*brief[t]*) the affix is voiceless like the preceding [f]. The Correspondence model explains this difference directly: the weak Corr-1 allows the stem to change, while the strong Corr-2, when extended to regular past tenses, forces the change to occur in the affix instead. For traditional word-formation rules, including Pinker's rule of just adding *-ed*, there would be no reason for these asymmetries: once stem and affix come out of the rule that combines them, they will be on a par and directionality of voicing assimilation would be a toss-up.

So, *kept* has regular syllable structure just as C1 *paréntal* has regular stress, while *beeped* has

irregular syllable structure just as C2 *éffortlessness* has irregular stress. Many of the morphological irregularities like *ring/ rang* constitute in fact SUB-regularities, witness *sink/ sank*, *ring/ rang*, etc. just as C1 *compulsive* patterns with *repulsive*, *impulsive*, as well as *repulsion*, *compulsion*, etc.; and many irregulars still feature the standard past tense affix *-t*, as in *think/ thought*, *buy/ bought*, etc. Hence irregulars show both features of C1 items: morphological irregularity/ sub-regularity and phonological regularity. These two features coexist not because they are the same (phonology is not just memorized idiosyncrasy), but because low-ranked Corr-1 unleashes both, while high-ranked Corr-2 reins both in, and regular past tenses simply follow the C2 pattern. Once the English past tense dichotomy is seen as part of the C1/ C2 distinction, we can see that the Dual Route model cannot be upheld: C1 is not just memory as we just noted, and C2 is not just a product of a 'regular' route, else the regularities of the phonology would be expected on that same route as well. Instead, while we have seen that regular shortening, stress, and syllabification all obtain with C1 items, C2 items are irregular in each of these respects: *flÁvorful*, *éffortless*, and *beeped*. And yet some phonology does obtain with C2 items as well, showing that phonology is not a property of any one 'route'. We have seen that voicing assimilation applies to both C1 and C2 items, but in different directions, whence *le[f]t*, but *mov[d]*, not **mo[f]t* as predicted under Correspondence. Similarly, insertion of [i] as in 'regular' *permitt[i]d* is not very different from insertion in *acceptab[i]lity*, but in C2 *permitt[i]d* such insertion does not alter the stem *permit*, while in C1 *acceptab[i]lity* it does alter the stem *acceptable*. In other words, there are phonological processes that occur freely to stems in C1 items (low ranked Corr-1) and that occur in C2 items as well as long as they affect only the affix and not the stems (high ranked Corr-2). Affixes are not bound by Correspondence but come from an 'Input', whose rank is lower than that of Corr-2, as in v) above. Recall that the high ranking of Corr-2 is also why C2 items exhibit no stem idiosyncrasy (like *compulsive*), which would come from an input. That is also why C2 items are more productive: No Input is needed to validate the outcome, so Corr-2 works as a freely generative schema, without being a 'rule'. In contrast, consider a C1 item like *satirÍze*. Here, the stem vowel shortens (cf. *satÍre*), but the affix vowel does not. This is the opposite asymmetry than with C2 items. Here the stem is *more* vulnerable to phonological effects than the affix. Again, this follows from the Correspondence account. In the affix *-Íze*, the vowel does not shorten for the same reason it does not shorten in morphologically simple *vÍtamin*: Input dominates No long V. It shortens in the stem because low ranked Corr-1 is what is relevant, not Input. A traditional word-formation rule would, in this case, again, give the same status to stem and affix, and by producing 'Underlying Representations' it would give both the same status as morphologically simple words (like *satÍre*), incorrectly. So, Correspondence is needed throughout.

Finally, there is one type of phonological effect that occurs even in stems of C2 items. So, in *decided*, or *united* (as well as *deciding*, *uniting*, etc), the stem-final *d* or *t* is pronounced as an alveolar flap in American English, breaking the correspondence with the stem, that has regular *d* or *t*. This variation is referred to as 'allophonic', because it produces sounds that exist only as 'allophones' of some existing sound, and not sounds that exist independently in the language. The latter would be called 'contrastive' variation. The Am. English flap is an allophone of *t* or *d* produced only in very specific contexts (after a stressed vowel and before another vowel). In Optimality Theory, any allophonic variation is guaranteed to come from relatively high-ranked constraints. So, here, to exclude the flap from the language at large, there must first be a constraint, let us call it No Flap dominating Input; then to introduce the flap in specific contexts there must be a further constraint, let us call it Flapping-(context) dominating No Flap, and -by transitivity- dominating Input as well. By this logic, all allophonic variation is correctly predicted to always occur in both simple items (cf. *atom*, with a flapped *t*) and C1 items (cf. poetic, also

with a flapped *t*), since the relevant constraints must dominate both <u>Input</u> and lower-ranked <u>Corr-1</u>. As for C2 items, we predict that allophonic variation MIGHT well occur with them as well. Here, the independently high-ranked <u>Flapping-(context)</u> must evidently dominate C2 Correspondence as well. This conditional relation: if some variation occurs in C2 stems, then it will occur in ALL items including C1, would be inexpressible if C2 items were on their own separate route, since the 'routes' would be independent by definition.

In sum, the workings of Phonology are not definable by the criteria of the Dual Route model. On the one hand, regular phonology, like regular stress and syllabification, should find a home on the 'regular' route, but -paradoxically- such regularities are found only on the 'irregular' one instead. On the other hand, Phonology is not absent from the regular route, showing that its scope cannot at all be defined by 'route'. So flapping would just occur on both routes by accident, and yet this cannot be a property exclusive to allophonic variation, because both voicing assimilation and [i] insertion are 'contrastive' and both occur in both classes as well. Hence, there is no independent criterion to determine what phonology would occur on which route. Rather, its exact distribution can only be characterized by its interaction with the three types of opposing constraints proposed here: <u>Input</u>, for simple items including affixes, and <u>Corr.-1</u> and <u>Corr-2</u> respectively, for the two classes of stems. 'Routes' do not seem to matter.

References
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