FUSION AND ALIGNMENT: THE CASE OF MALAY[1]

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1 Issues

1.1 *The Original Problem*

The facts of prefixation in Malay, in the case of nasal-final prefixes (e.g 'meN-' (transitive)), follow in (1). (Roots are underlined.)

1.	a. məN + <u>pukol</u>	[məmukol]	'hit', v.t.
	b. məN + <u>kupas</u>	[məŋupɑs] ('mengupas')	'peel', v.t.
	c. məN + <u>təntu</u> + kan	[mənəntukɑn]	'determine', v.t.
	d. məN + <u>buwat</u>	[məmbuwat]	'make', v.t.
	e. məN + <u>garam</u>	[məŋgaram] ('menggaram')	'salt', v.t.
	f. məN + <u>dəsu</u>	[məndəsu]	'resound', v.i.

Rule-ordering analyses of this data would claim that that nasal substitution in Malay involves the prefix-final nasal (N) assimilating to the place of articulation of the first sound of the following root (Rule 1), followed by deletion of that onset obstruent in the case of voiceless-obstruent-initial roots (e.g. /p/, /t/, /k/) (Rule 2). Thus, for instance, [məmukol] ('mempukul', *hit, v.t)* is correct, but *[məmpukol] is ungrammatical.

1.2 *OT and the Problem*

Such an analysis of the facts raises the following concern. Assimilation and deletion are two separate and unrelated processes, and there is no lack of cross-linguistic data to demonstrate this fact. Stipulating that the Malay data represents the product of a two-step process is not explanatorily adequate because it fails to explain why the processes occur together.

Optimality Theory avoids such stipulation, since it does not support a processual analysis of the data. In Optimality Theory, possible pronunciations (output candidates) of a word (input) are evaluated simultaneously against a set of ranked constraints. The pronunciation that incurs the fewest violations of the constraints is selected as the 'optimal' one (See Appendix A for the fundamental tenets of Optimality Theory). A recent Optimality theoretic treatment (Pater 1996) involves claiming that 'fusion' is a more desirable account of the above prefixation facts. A fusion version of $\text{mə}N_1 + p_2\text{ukol}$ follows in (2), where a two-to-one mapping is seen to hold between the two input segments, N_1p_2, and the single output segment, $m_{1,2}$.

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2. input m əN_1 + $\underline{p_2}$ u k o l
\ /
output m ə $m_{1,2}$ u k o l

Pater's one-step analysis is meant to eliminate the explanatory gap inherent in two-step analyses of the Malay facts. Pater sees fusion as one of many 'repair' strategies adopted by various languages to avoid the sequence Nasal + Voiceless Obstruent (henceforth, 'NT').[2] He cites the faithfulness constraint LINEARITY (McCarthy and Prince 1995), which stipulates that S1 reflect the precedence structure of S2, and vice versa, where S1 is the input and S2 the output. (See Appendix B for full statement of all constraints employed in this paper). Bearing this in mind, consider once again the facts of 'fusion', depicted in (3). (The segment resulting from fusion has two indices associated with it.)

3. məN_1 + $\underline{p_2}$ileh (input)
\ /
mə $m_{1,2}$ ileh (output) (Pater 1995:6)

As explained by Pater, N_1 precedes p_2 in the input, but not so in the output. This means that the output violates LINEARITY. The ranking that Pater thus proposes is responsible for the output selected is stated in (4).

4. *NT > LIN (where LIN = LINEARITY)

The tableau in (5) derives from Pater 1996, and shows the result of this ranking. ('✓' denotes the optimal candidate.) The candidate in (5b), in which no fusion has occurred, violates *NT and is eliminated. Fusion, in (5a), violates LINEARITY but obeys the more high-ranked *NT, and is therefore the preferred option.

5. **Fusion: *NT >> LIN (Pater 1996:9, #7)** [3]

Input: mə N_1+$\underline{p_2}$ileh	*NT	LIN
a. mə$m_{1,2}$ ileh ✓		*
b. məm_1 p_2 ileh	* !	

Root-internal data in Malay does not, however, seem to involve fusion. (See Appendix C.c) Pater accounts for this fact by claiming that it is more undesirable to allow fusion root internally than it is to permit the undesirable sequence, but that the constraint against the sequence, *NT, is a more powerful constraint than a constraint (LINEARITY-ROOT) that militates against non-root-internal fusion. Thus the constraints responsible for

[2] Pater finds that other attested strategies are nasalization of the obstruent, denasalization of the nasal, and deletion of the nasal.

[3] For typological simplicity, I have chosen to use neither Pater's 1996 *N constraint nor his 1995 version, *NC̥ but *NT. The check denotes the optimal candidate

selection of the optimal candidate in this analysis include both a root-specific and non-root-specific version of a constraint against fusion. The root-specific constraint outranks *NT, which in turn outranks the general LINEARITY constraint. The relevant ranking is expressed in (6). The tableau in (7) illustrates the selection made. Candidate (7a) fails to get selected because the high-ranked root-specific LINEARITY is violated since fusion has occurred within a root. The non-fusion candidate, (7b), which violates the lower-ranked *NT, is selected instead.

6. LINEARITY-ROOT >> *NT >> LINEARITY

7. **Root-internal NT tolerance: LINROOT >> *NT>> LIN**

Input: $\underline{\text{ə}m_1p_2\text{at}}$	LINROOT	*NT	LIN
a. $\text{ə}m_{1,2}$ at	* !		*
b. ə m_1p_2 at✓		*	

(Pater 1996:10, #8 and Pater 1995:8)

1.3 *Further Complications*

Pater writes, 'Clearly a lot of work needs to be done to determine the empirical coverage of root-specific LINEARITY constraints' (Pater 1995) — and it does. There is further data in Malay that fails to be accounted for by this analysis. Specifically, the boundaries a) between prefixes, b) between suffixes, c) between reduplicants, and d) between roots and suffixes do not pattern along the dichotomy Pater suggests. (See Appendix C for data in question.) Thus, for instance, fusion does not occur between prefixes, but there is nasal place assimilation, as shown in (8). (Again, italics denote the result of fusion.)

8. məN + pər + <u>səmbah</u> (+kan)
   məmpərsəmbahkan, (*mə*m*ərsəmbahkan)
   \ |
   lab 'present (verb)'+ performative

These facts mirror the root-internal facts of the language. In the environments (b-d) (above), neither fusion nor place assimilation is in evidence. Taken together with the prefix-root boundary, which is the only spot where fusion does seem to occur, these facts indicate the need for some new explanation.

2 Analysis

2.1 *A New Dichotomy*

I maintain that parameterizing a fusion constraint according to environment would fail to capture the generalization underlying all the environments, and would be theoretically uneconomical. I suggest instead that there is a dichotomy between sequences of segments that are homogenous with respect to morphological category-type (e.g. root-internal, prefix-prefix, suffix-suffix, reduplicant-reduplicant) and those that are heterogenous with respect to morphological category type (e.g. prefix-root, root-suffix). Fusion is blocked in the former type of sequences, but may be permitted in the latter. I take my cue from

McCarthy and Prince (1995), extending their UNIFORMITY constraint against coalescence (fusion) by specifying the domain of it application as in (9b).

9. a. UNIFORMITY (M&P 19995): S2 may not have multiple correspondents in S1.
b. UNIF-HMG: S2 may not have multiple correspondents in S1, where S1 an environment that is homogenous with respect to morphological category-type

The ranking of constraints that I propose follows in (10).

10. UNIF-HMG >> *NT

I omit irrelevant candidates (e.g. post-nasal voicing, epenthesis, etc.) in (11), which illustrates the result of the ranking in (10).

11. **Prefix-prefix juncture: No fusion**

Input: məN_1 + p_2ər + (buwat)	UNIF-HMG	*NT
a. məm_1p_2ər.. ✓		*
b. mə$m_{1,2}$ər…	*!	

The fusion candidate, in (11b), violates UNIF-HMG and is eliminated. The selected non-fusion candidate, in (11a), honors this constraint although it violates the low-ranked *NT. All other environments are tested in (12), using the same constraint ranking as in (11). The ranking. selectes grammatical outputs in all three cases. Root-internally (in (12a)) and between suffixes (in (12c)), fusion is blocked because it would involves violating the high-ranked UNIF-HMG. The opposite holds in the heterogenous environment that obtains at the prefix-root juncture, fusion selected over an *NT violation.

12. a. **Root-internally: No fusion**

Input: tə$m_1p_2$at	UNIF-HMG	*NT
i. tə$m_1p_2$at ✓		*
ii. tə$m_{1,2}$at	*!	

b. **Prefix-root juncture: Fusion**

Input: məN_1+ $p_2$ileh	UNIF-HMG	*NT
i. mə$m_{1,2}$ileh✓		
ii. mə$m_1p_2$ileh		*!

c. **Suffix-suffix juncture: No fusion**

Input: ..+kan_1+ $k_2$ah	UNIF-HMG	*NT
ka$n_1k_2$ah✓		*
ka$ŋ_{1,2}$ah	*!	