**Neutrality and re-pairing in Ogori vowel harmony: A target-oriented analysis**

*Avery Ozburn, University of British Columbia*

In many analyses of vowel harmony, either implicitly or explicitly, neutrality is linked to a lack of harmonic counterpart in the inventory. However, a lack of harmonic counterpart is neither a necessary nor sufficient condition for neutrality. Vowels that have harmonic counterparts may nonetheless be neutral, like the low vowels [a, ʌ] in Mayak ATR harmony (Andersen 1999), and vowels that lack counterparts may nonetheless participate, either by re-pairing with another vowel in the inventory or through allophonic changes. For example, high and low vowels in Ogori, which are not contrastive for ATR, alternate harmonically in prefixes with mid vowels (e.g. [i]~[ɛ]; Chumbow 1982), while in Kinande, non-high vowels participate allophonically in regressive ATR harmony (Archangeli and Pulleyblank 1994). In both Ogori and Kinande, the non-contrastive vowels that participate in some contexts are neutral in others, within roots and in progressive harmony respectively. Such cases are critical to understanding when and why certain vowels are neutral. In this paper, I focus on Ogori, arguing for a target-oriented analysis in which neutrality is the result of a vowel being a poor potential target for harmony. Such an analysis can easily capture the Ogori data, incorporates cross-linguistic generalizations about tongue root harmony, and extends to a wide variety of other patterns.

In Ogori, the vowels [i,u,a] all lack counterparts for ATR, while mid vowels are paired [e,ɛ,o,ɔ] (Chumbow 1982). Within roots, only harmonic combinations of mid vowels can occur (e.g. [ógbẽ], [ɔ̀tɛ́lɛ́]), but high and low vowels are neutral, occurring freely with each other and with both ATR and RTR mid vowels, as in [fisɛ] and [bílá] (Chumbow 1982). However, all three unpaired vowels trigger harmony from root to affix, as seen in the prefix alternation in [ò-sìútũ] versus [ɔ̀-jájɔ] (Chumbow 1982). Moreover, in prefixes, the high and low vowels undergo harmony themselves, re-pairing with mid vowels such that [i]~[ɛ], [u]~[ɔ], and [e]~[a], as in the 1sg prefix in [ì-jé] versus [ɛ̀-nɛ́] (Chumbow 1982). In suffixes, the same alternations occur for some speakers, while for others, [a] is neutral (Chumbow 1982).

Previous accounts of Ogori (e.g. Chumbow 1982, Calabrese 1988) require extensive use of underspecification and stipulations, especially to capture the differences between roots and affixes. These analyses also tend to ignore the speakers for whom [a] is neutral in suffixes. In contrast, I argue that all of the Ogori data can be seen as a direct consequence of a combination of principled cross-linguistic facts. First, roots tend to be more faithful than affixes (Beckman 1997). Second, mid vowels are ideal participators in tongue root harmony; Casali (2008) notes that, in contrast to high and low vowels, mid vowels are rarely neutral to tongue root harmony, even when unpaired. Finally, the variable behaviour of [a] is reduced to the facts that low vowels are poor undergoers of ATR harmony (Archangeli and Pulleyblank 1994) and that regressive harmony tends to be stronger than progressive harmony (Hyman 2002). In my analysis, the key to neutrality is not lack of harmonic pairing, but rather a vowel not being good enough as a potential harmony target to outweigh relevant types of faithfulness in a particular context.

I implement this perspective formally by extending Kimper's (2011) concept of trigger strength, in which the weight of the harmony constraint is scaled by a constant that depends on the trigger; I add a scaling factor for the quality of the potential target. With a negative harmony constraint, the result is that disharmony can be penalized to a greater extent with a good potential target than with a bad one. Relative target quality is consistent cross-linguistically, but a language can choose to conflate parts of the scale so that certain distinctions are not made.

Since mid vowels are good triggers and targets of tongue root harmony, their trigger strength and target quality scaling factors will be higher than those of low or high vowels, so that disharmony will be penalized more. Harmony will then outweigh root faithfulness only for combinations of mid vowels. Between prefix and root, root faithfulness is not at issue, and all combinations can undergo harmony, even though height features must change. Since low vowels are poor undergoers of harmony and progressive harmony tends to be weaker, this analysis can also be extended to the speakers for whom [a] does not undergo harmony in suffixes. Critically, this account requires no underspecification; the facts follow directly from comparing the importance of harmony in specific combinations of vowels to various types of faithfulness.

A simplified explicit illustration is given in Tables 1-3. The constraint weights are 3 for Ident-IO[ATR]-Root and 1 for a general ATR-Harmony constraint, with trigger and target scaling for ATR-Harmony set as 1 for non-mid vowels and 2 for mid vowels. The -1 in the tableaux indicates one violation, and the winning candidate is the one with the score closest to zero. Within roots, we correctly predict harmony among mid vowels (Table 1) but not with other combinations (Table 2). In contrast, across a boundary, when Ident-IO[ATR]-Root is irrelevant, harmony occurs even among non-mid vowels (Table 3).

| /ɔ…e/ | Ident-IO[ATR]-Root<br>weight = 3 | ATR-Harmony<br>weight = 1 | $\mathcal{H}$ |
|---|---|---|---|
| ɔ…e | | -1*2(target scaling for ɔ)*2(trigger scaling for e) | -4 |
| ☞o…e | -1 | | -3 |

Table 1: ATR harmony among mid vowels within roots

| /ɔ…i/ | Ident-IO[ATR]-Root<br>weight = 3 | ATR-Harmony<br>weight = 1 | $\mathcal{H}$ |
|---|---|---|---|
| ☞ ɔ…i | | -1*2(target scaling for ɔ)*1(trigger scaling for i) | -2 |
| o…i | -1 | | -3 |

Table 2: Neutrality of non-mid vowels within roots

| /a +…i/ | Ident-IO[ATR]-Root<br>weight = 3 | ATR-Harmony<br>weight = 1 | $\mathcal{H}$ |
|---|---|---|---|
| ☞ e…i | | | 0 |
| a…i | | -1*1(target scaling for a)*1(trigger scaling for i) | -1 |

Table 3: Non-neutrality of non-mid vowels across morpheme boundaries

Thus, the target scaling approach to neutrality presented here provides a simple, motivated analysis of the complex re-pairing and neutrality data in Ogori, reducing the pattern to cross-linguistic trends of root faithfulness and preferred triggers/targets. Further, I show how connecting neutrality with poor target quality can be extended beyond Ogori, providing a deeper understanding of the nature of neutrality cross-linguistically.

**References**


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