

Evaluating the Empirical Basis for Output-Output Correspondence

Author(s): Mark Hale, Madelyn Kisson and Charles Reiss

Proceedings of the Twenty-Third Annual Meeting of the Berkeley Linguistics Society: General Session and Parasession on Pragmatics and Grammatical Structure (1997), pp. 137-147

Please see “How to cite” in the online sidebar for full citation information.

Please contact BLS regarding any further use of this work. BLS retains copyright for both print and screen forms of the publication. BLS may be contacted via <http://linguistics.berkeley.edu/bls/>.

The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](#), the Linguistic Society of America's digital publishing platform.

Evaluating the Empirical Basis for Output-Output Correspondence*

Mark Hale, Madelyn Kissock and Charles Reiss
 Concordia University,¹ Oakland University²

1. Overview of paper

Output-output correspondence (OOC) constraints, constraints which demand correspondence between independently occurring surface forms, have recently been added to the set of constraint types invoked in much OT work. In this paper we examine some of the better-known arguments originally adduced in support of OOC constraints, and argue that adoption of such a powerful mechanism is not justified, at least in the cases discussed. This paper deals specifically with the following: the incomplete/complete phase distinction of Rotuman, as analyzed by McCarthy (1995); English truncated hypercoristics, as discussed by Benua (1995); and the treatment of Base Identity and Uniform Exponence in Kenstowicz (1994).

Three criticisms are leveled at the OOC-based analyses cited above. First, we find cases of ‘opportunism.’ For example, there is an unprincipled culling of the data and an unprincipled choice of bases in correspondence relations. Second, there is misanalysis, in that clearly significant generalizations are overlooked, technical aspects of the theory are improperly treated and implausible generalizations are accepted. Third, we believe that the analyses based on OOC lead to problematic predictions, some of which are strongly contraindicated by existing data, and others of which we consider highly suspect.

We offer simple, principled solutions which we hope will contribute to a more constrained theory of phonology — one that perhaps has no place for OOC.

2. Rotuman Phase: McCarthy (1995)

In discussing the distribution of the Rotuman phase distinctions, McCarthy (1995:2) adopts the view of Churchward (1940), though no details are provided: “Rotuman has a contrast in major-category words between two phases, the complete and the incomplete, distributed according to syntactico-semantic principles.” As we will see below, the phases are, instead, PHONOLOGICALLY, conditioned. To account for the phonological differences between the (syntactico-semantically conditioned) phases, McCarthy proposes the following constraint:

(1) Inc-Ph Constraint (McCarthy 1995:11)

Every incomplete-phase stem ends in monosyllabic foot
 (or heavy syllable).

Align($\text{Stem}_{\text{Inc.Ph.}}$, Right, $[\sigma]_{\text{Ft}}$, Right) (or Align($\text{Stem}_{\text{Inc.Ph.}}$,
 Right, $\sigma_{\mu\mu}$, Right))

The ranking of this constraint within the larger OT constraint hierarchy, including the familiar types of OT Faithfulness and Well-formedness constraints, accounts for the descriptive observation that “the incomplete phase is identical to the com-

plete phase, except for the fact that the *final foot* of the complete phase is realized as a *monosyllabic foot* in the incomplete phase” (McCarthy 1995:11). This accounts for alternations of the type *tokiri_{comp}:tokir_{inc}* (deletion), *seseva_{comp}:seseav_{inc}* (metathesis), etc.³ McCarthy claims that the underlying representations of complete and incomplete phase forms in (2) differ in that the latter contains an additional morpheme which is sensitive to the constraint given in (1).

- | | | |
|-----|---------------------------------------|--|
| (2) | Complete Phase Input
<i>tokiri</i> | Incomplete Phase Input
<i>tokiri</i> +INCPH |
|-----|---------------------------------------|--|

First, we believe that the assumption that there is a ‘syntactico-semantic’ basis for the phase distinctions must be rejected. According to Churchward (1940), the incomplete phase is associated with an ‘indefinite’ interpretation when applied to nouns; in the case of verbs, Churchward proposes an imperfective or non-completive reading for the incomplete phase. In contrast, the complete phase, is to be correlated with ‘definite’ interpretation, ‘positiveness, finality, or emphasis’, or a perfective or completive interpretation for verbs. We are dubious of Churchward’s equation of noun definiteness and verbal aspect, since it is apparently without parallel, but there are more basic reasons to discard the analysis.

A sentence like (3)⁴ shows that even a personal pronoun like *gou* ‘I’, which corresponds to complete phase *goua*, can show phase distinctions. It seems highly unlikely that the first person pronoun could ever be interpreted as indefinite.⁵

- | | | |
|-----|---|--------------------|
| (3) | <i>gou la tiik iris</i>
I _{inc} / FUT / stop _{inc} / them _{inc} | ‘I will stop them’ |
|-----|---|--------------------|

Sentences (4) and (5) further demonstrate the problem of attributing phase alternations to syntactico-semantic principles. The verb *noh(o)* ‘live’ shows precisely the same aspectual form and interpretation in the two sentences, yet it is in the incomplete phase in (4) and in the complete phase in (5). In fact, *all verbs* are in the complete phase before the anaphoric clitic *e*, regardless of the aspectual interpretation of the verb. Note also that an ‘indefinite’ interpretation of personal names such as *Titof* and *Raho* is semantically excluded — in spite of their being in the incomplete phase. The corresponding complete phase forms are *Titofa* and *Raho*.

- | | | |
|-----|--|--|
| (4) | <i>ma Titof noh ma tupue 'te 'is 'e Faufano</i> (II.9)
and / Titof _{inc} / lived _{inc} / with / tupu'a _{inc} / this _{inc} / at / Faufano
‘and Titof lived with this <i>tupu</i> ‘a at Faufano’ | |
| (5) | <i>ia tä puer se hanue=t ne Rah noho e</i> (I.3)
he / TNS / rule _{inc} / over / land=the _{inc} / where / Raho _{inc} / lived _{comp} / there(in)
‘he ruled over the land in which Raho lived’ | |

In (6) and (7) we provide a partial list⁶ of suffixes and clitics which invariably trigger the complete phase and the incomplete phase, respectively.

- (6) Suffixes and clitics which invariably trigger the complete phase
- ga* 'nominalizer': *pu'a* 'to be greedy' > *pu'aga* 'greed'
 - me* 'hither': *ho'a* 'to take' > *ho'ame* 'to bring'
 - a* 'trans. suffix': *hili* 'to choose (intr.)' > *hilia* 'to choose s.t. (tr.)'
 - e* 'locative anaphor': *noho* 'to dwell, live' > *noho e* 'to dwell therein'
- (7) Suffixes and clitics which invariably trigger the incomplete phase
- ia* 'ingressive': *sunu* 'to be hot' > *sun'ia* 'to become hot'
 - âki* 'causative': *tole* 'to carry' > *tol'âki* 'to cause to be carried'
 - kia* 'transitive': *ho'a* 'to take (intr.)' > *hoa'kia* 'to take (tr.)'
 - ta'a* 'that': *vaka* 'canoe' > *vak ta'a* 'that canoe'

Note that there is no sense in which the *ho'a* of *ho'ame* 'to bring' is a 'definite' version of *ho'a* 'to take,' or in which the *sun* of *sun'ia* 'to become hot' is an 'indefinite' version of *sunu* 'to be hot.' Equally clearly, the incomplete phase *vak* (from *vaka* 'canoe') in *vak ta'a* 'that canoe' is definite.

A coherent pattern does emerge, however, in that the suffixes and clitics in (6) are all *monosyllabic*, whereas those in (7) are *disyllabic*. It is not our goal to provide here a full OT analysis of the complete/incomplete alternations (deletion, metathesis, etc.). The details of our analysis can be found in Hale & Kisseck (1996, 1997) and Hale, Kisseck, & Reiss (1997). Many aspects of McCarthy's analysis can be preserved in the purely phonologically-based account which we propose. We restrict ourselves here to stating the algorithm which describes where incomplete phase formation occurs within the prosodic domain of the clitic group:

- (8) Phonological Conditions for Clitic Group Incomplete phase
- Build R>L binary feet within each clitic group. If a vowel is both at the right edge of a foot and a morpheme, that vowel will undergo the effects of Incomplete phase formation.

McCarthy's description of the correspondence relations among underlying (lexical) form, complete phase surface form and incomplete phase surface form is described in (9) and sketched in (10):

- (9) "With respect to its vocalism and its foot structure, the incomplete phase is faithful to the complete phase, rather than the lexical form, strongly supporting the correspondence-based model in (54)". [McCarthy 1995:47]

(10) McCarthy's (54) specifies the following correspondence relations:

Lexical Specification



Complete Phase Surface ⇒ Incomplete Phase Surface

There exists, however, another set of phonologically conditioned alternations affecting Rotuman stems. This so-called broad/narrow alternation involves shifting the vowel *a* > *e* in well-defined phonological environments (see Hale and Kisko 1996, 1997 for details). In (11) we see that a morpheme like *i'a* actually has four surface variants, depending on phase context and broad/narrow context. The morpheme *puga*, however, has only three variants, due to the phonological makeup of the stem.

(11) The broad/narrow alternation

	Complete phase contexts	Incomplete phase Contexts
Broad version contexts	<i>i'a</i> <i>puga</i>	<i>ia'</i> <i>puag</i>
Narrow version contexts	<i>i'e-</i> <i>puge-</i>	<i>ie'-</i> <i>puag-</i>

The relevance of the broad/narrow alternation becomes apparent when we try to decide which complete phase form should serve as the basis of comparison in correspondence relations for narrow version incomplete phase forms. If we choose the narrow version complete phase form, we get the correct result in the case of *i'e-* and *ie'*—since “[w]ith respect to its vocalism and its foot structure, the incomplete phase is faithful to the complete phase”; but we get the wrong result in the case of *puge-* and *puag*, since the latter has an *e* but the former has an *a*. If we, instead, choose the broad version complete phase form as the basis of correspondence, then we get the correct result for *puga/puag*, but not for *i'a/ie'*. This is sketched in (12):

(12) Which ‘Output’ is base for Narrow Incomplete forms?

Broad Complete		Narrow Incomplete
** <i>i'a</i>	>	<i>ie'</i>
<i>puga</i>	>	<i>puag-</i>
Narrow Complete		Narrow Incomplete
<i>i'e</i>	>	<i>ie'</i>
** <i>puge-</i>	>	<i>puag-</i>

We can summarize the discussion so far as follows. The syntactico-semantic basis for the phase distinctions which McCarthy adopts from Churchward is implausible, since no known language expresses the range of meanings which Churchward associates with the incomplete phase through a single morpheme. Furthermore, the existence of a definiteness distinction on personal pronouns is semantically incoherent. Since we have demonstrated the phonological conditioning of the phases, it is clear that there is no incomplete phase morpheme, contra McCarthy's analysis presented in (2) above; therefore there can be no OOC between the phases since the two phases are underlyingly identical. Finally, even if we wanted to invoke OOC to capture the phase relations, we have no principled method of selecting a base that will also account for the productive broad/narrow alternation.

3. English Hypocoristics (Benua 1995)

Benua's discussion of OOC in the generation of truncated names in certain New York and Philadelphia dialects of English also appears to suffer from opportunism, misanalysis and implausible predictions. Benua posits a constraint against word-final sequences of æ followed by r in these dialects, based on an apparent distributional gap. The sequence in question does occur, but only in hypercoristic forms such as those listed in (13) which are related to forms containing medial $-\text{æ}r-$.

(13) Posited constraint: $*\text{æ}r\#$

Larry	Lar	$[\text{æ}r\#]$
Harry	Har	$[\text{æ}r\#]$
Sarah	Sar	$[\text{æ}r\#]$
		$[\text{k}ar] / *[\text{kæ}r]$

This well-formedness constraint is violated in such forms, according to Benua, since it is outranked by constraints demanding correspondence between truncated and non-truncated forms. Note, first of all, that the analysis rests on the assumption that the absence of $[\text{æ}r\#]$ in these dialects of English is the result of a phonological constraint rather than being an accidental gap. The oft-touted property of OT that such grammars "repair" *any* input to conform to the surface phonology of the language in question gives rise to a prediction. If there really is a $*\text{æ}r\#$ constraint and it is "active" in these dialects, then speakers of these dialects should be unable to pronounce $-\text{æ}r\#$ sequences when learning languages which *do* allow them. We strongly suspect that this is a false prediction.

The truncated names in (14) preserve the vowel quality of their corresponding full. The full form, which must be lexically listed, serves, in Benua's analysis, as the basis of correspondence for the monosyllabic truncated forms. However, (15) shows that monosyllabic forms are not consistently faithful to the vowel of the full names, nor is the disyllabic hypercoristic consistently faithful to the full

form. The absence of *Sarry, however, demonstrates that the truncated form need not be related to a disyllabic hypercoristic.

(14) Sarah Sar *Sarry
 Harold Har

(15) Lawrence [lɔrəns] Larry [læri] *Lawry [lɔri]
 Lawrence [lɔrəns] Lar [lær] *Lawr [lɔr]

Therefore, there can be no general principle of vowel quality faithfulness in the formation of truncated hypercoristics. Only by opportunistically restricting the data considered does the analysis succeed in capturing attested forms.

Benua's model of OOC in these forms essentially parallels that which McCarthy sketches for Rotuman. The following quotation can be compared to the model described in (9) and (10) above:

(16) Discussing Larry:Lar, Benua says (1995:6):

...there is no correspondence relation between the input and truncated output form. This predicts that truncated words will never be more faithful to the underlying stem than the base is. That is, there should be no case in which the base shows epenthesis, deletion, coalescence or other lack of faithfulness to the input that is not also observed in the corresponding truncated words.

This prediction is falsified by the forms in (17) which show that the underlying t/d contrast is maintained in truncated forms, but neutralized to flap [D] in the full forms.

(17) Truncation forms show more faithful consonants

Pe[D]er	Pe[D]ey	Pe[t]e
Ju[D]ith	Ju[D]y	Ju[d]e

In (18) we see that truncated forms may maintain vowel contrasts that are neutralized in full forms:

(18) Truncation forms show more faithful vowels

P[ə]tricia	P[æ]t
G[ə]rard	G[ɛ]r
L[ə]rraine	L[o]ri

To conclude this section, we propose that a far more plausible analysis is that truncated hypercoristics are lexicalized. Note that in a great number of common cases this is, in fact, the only possible analysis.

- (19) Nathaniel Nate [note *Nathe, *Nathy]
 Robert Bob
 Margaret Peg
 Edward Ted

In the case of English hypercoristics our command of the data, as native speakers, is clearly much better than in most other cases cited in the literature. Flaws discovered in an OOC analysis of this data, then, should serve as caution signals for cases where the data are much less understood and accessible.

4. Uniform Exponence (Kenstowicz 1994)

Kenstowicz (1994) discusses several types of OOC, including Uniform Exponence and Base-Identity. The Uniform Exponence constraint which Kenstowicz adopts is defined in (20):

- (20) Uniform Exponence: minimize the differences in the realization of a lexical item (morpheme, stem, affix, word).

Uniform Exponence, therefore, appears to be a functionally motivated constraint, the effect of which is to avoid allomorphy.

The only case we have space to consider in this context concerns Kenstowicz's analysis of the *honor*, *hono:ris*, *hono:rem...* paradigm of Latin (see Hale, Kisko, and Reiss 1997 for a treatment of additional cases). Kenstowicz cites the adjective *honestus* 'honest' as providing evidence that this morpheme has in fact an underlying /s/. Crucial to the analysis is the claim that *honestus* is 'close enough' to *honor* to provide an acquirer with the critical evidence that, in spite of the invariant realization of the final segment of the nominal stem as [r], it should be taken as the realization of underlying /s/. The form *honestus* must therefore be analyzed by an acquirer as *hones-tu-s*, with the first morpheme being the same as that in *honor*, *hono:ris*, *hono:rem...* Note that there is variation in vowel of the second syllable of this "morpheme" as well as the *r:s* difference. The constraint UE(N) is to be interpreted as 'uniform exponence within the nominal paradigm'. Critically, due to the interpretation of UE(N), *hones-tus* is left out of consideration in evaluating the 'uniform exponence' of this morpheme. This clearly represents opportunistic selection of the material considered for comparison. Kenstowicz's evaluation of UE(N) for this Latin paradigm is given in (21) below where *VsV is the constraint responsible for Latin rhotacism, whereby underlying /s/ surfaces as [r] between vowels.

(21) Tableau for *honor, hono:r-is, etc.* (from Kenstowicz 1994:44)

/hono:s, hono:sis, hono:sem, .../

	<u>UE(N)</u>	*VsV	Faith-/s/
☞ honor	<u>✓</u>	✓	***...
hono:r-is			
hono:r-em			
honos	*!	✓	**...
hono:r-is			
hono:r-em			
honos	<u>✓</u>	*!*...	✓
hono:s-is			
hono:s-em			

The UE(N) satisfaction checkmarks for these three paradigms are clearly unjustified, given the *phonemic* differences in vowel length within the paradigm. We have used a crooked underline to highlight the offending marks. In order to remedy this inaccurate evaluation we provide a new tableau which corrects the evaluation of UE(N) and also expands the candidate set.

(22) Tableau with fuller candidate set and corrected evaluation marks

/hono:s, hono:sis, hono:sem, .../

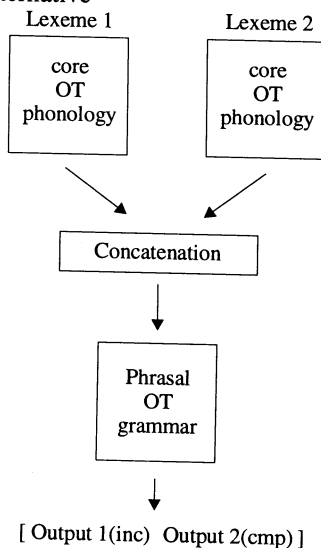
	<u>UE(N)</u>	*VsV	Faith-/s/
☞ hono:r	✓	✓	***...
hono:r-is			
hono:r-em			
hono:s	✓	*!*...	✓
hono:s-is			
hono:s-em			
honos	*!	✓	**...
hono:r-is			
hono:r-em			
honor	<u>*!</u>	✓	***...
hono:r-is			
hono:r-em			
honos	<u>*!</u>	**...	✓
hono:s-is			
hono:s-em			

The winning candidate, that which shows uniformity in all aspects (consonant and vowel quality) is not the attested paradigm in Latin. Note the corrected evaluations (with straight double underlining) of the sets from (21), as well as the fact that the actually attested paradigm (the winner in 21) comes in fourth in (22). The reader should confirm that a constraint banning the sequence *-o:r* word-finally will not remedy the situation. Uniform Exponence does not appear to be relevant to the extension of stem-final *-r* throughout these paradigms. We suggest that *honor* and *honestus* are no longer derivable from single underlying representation.

5. Discussion and conclusions

As stated above, we hope to make a positive contribution in this paper, besides merely pointing out flaws in attempts to analyse some very difficult data. Given the phonological conditioning of the Rotuman phase alternations, and given the fact that McCarthy acknowledges the *serial* nature of Rotuman derivations involving output-output correspondence, it may be justified to adopt a fairly conservative approach to Rotuman. By keeping a form of serialism, but doing away with output-output correspondence, we can capture pre-OT generalizations about the phonology of specific post-lexical prosodic domains (e.g., the clitic group in Rotuman). We sketch a model of such a grammar (or, to be more precise, pairing of optimality-theoretic phonological grammars) in (23).

(23) A Semi-Traditional Alternative



It is obvious that we cannot prove that OOC is never justified. It is also obvious that we cannot provide here alternative analyses for all the cases of OOC dis-

cussed in the literature. However, a device as powerful as OOC should only be adopted as a last resort.

In the conclusion to a later paper (Kenstowicz 1995:433), Kenstowicz raises some fundamental questions regarding the use of OOC. "Can [OOC] be restricted to situations in which one structure is a substring of the other? Or should we allow identity constraints to hold among a family of related words, e.g. to get the effects of paradigm levelling?" Kenstowicz goes on to note the vagueness of terms like 'family of related words' and 'isolation form'. Clearly, these terms need to be defined in order to select a base against which identity can be evaluated. As far as we can tell, these fundamental questions have yet to receive a satisfactory solution in the literature. The failings of the specific cases of OOC which we have discussed, those of McCarthy, Benua and Kenstowicz, are related to the absence of clear guiding principles concerning these fundamental questions. If phonological theory pretends to be constrained by standards of explicitness and rigor, OOC should be eschewed until these fundamental questions receive a more satisfactory treatment.

Notes

*We wish to thank audiences at BLS, WCCFL, AFLA, MOT for comments and discussion. Thanks also to Ida Toivonen for comments and discussion on drafts of this paper.

1. Hale and Reiss.

2. Kissock.

3. See Hale and Kissock (1996, 1997) for discussion of a fuller range of data. The limited number of examples in this paper are sufficient to illustrate our points.

4. All examples are taken from Churchward (1940).

5. The form *iris* is also an incomplete phase pronoun, corresponding (irregularly) to *irisa*.

6. The lists in (6) and (7) represent only a selection of the relevant clitics and suffixes; for a more complete survey see Hale & Kissock (1996, 1997).

References

- Benua, Laura. 1995. Identity Effects in Morphological Truncation. To appear in J. Beckman, S. Urbanczyk & L. Walsh (eds), *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, Graduate Linguistic Student Association, Amherst, MA (also ROA).
- Churchward, C. M.. 1940. *Rotuman Grammar and Dictionary*. Sydney: Methodist Church of Australasia.
- Hale, Mark and Madelyn Kissock. 1996. *The Phonology-Syntax Interface in Rotuman*. Austronesian Formal Linguistics Association meeting, UCLA (to appear in proceedings of same).
- . 1997. *The Incomplete Phase in Rotuman: a synchronic analysis*, ms., Concordia University and Harvard University.

- Hale, Mark, Madelyn Kissonck and Charles Reiss. 1997. What is Output? Output-output Correspondence in OT. *Proceedings of the West Coast Conference on Formal Linguistics XVI*, Seattle.
- Kenstowicz, Michael. 1995. Cyclic vs. non-cyclic constraint evaluation. *Phonology* 12, 397-436.
- Kenstowicz, Michael. 1994. *Base-Identity and Uniform Exponence: Alternatives to Cyclicity*. ROA.
- McCarthy, John. 1995. *Faithfulness in Prosodic Morphology & Phonology: Rotuman Revisited*. ROA.
- Titifanua, Mesulama and C. M. Churchward. 1938. *Tales of a lonely island*. Oceania Monographs, no. 4. Sydney [reprint Institute of Pacific Studies, University of the South Pacific, 1996].