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Phonology and Syntax in Rotuman: a Reply to den Dikken

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I. The Phenomenon

- (1) Rotuman is a member of the Central Pacific branch of the Oceanic subfamily of Austronesian, spoken mostly on the islands of Rotuma (politically part of Fiji) and Fiji by some 12,000 people.¹
- (2) Rotuman displays what Churchward (1940) labelled a ‘phase distinction’ (obviously having nothing to do with the 21st-century concept of the syntactic ‘phase’) in the surfacing forms of (most of) its morphemes: under some conditions, morphemes surface in what Churchward called ‘the complete phase’, under other conditions, in what Churchward called ‘the incomplete phase’. The ‘conditions’ involved will be the subject of our discussion today.
- (3) Some Rotuman phase distinctions:

Complete Phase	Incomplete Phase	
haʒa	haʒ	‘feed (v.)’
tokiri	tokir	‘roll (v.)’
mose	mös	‘sleep (v.)’
hoti	höt	‘embark (v.)’
pepa	peap	‘paper’
hosa	hoas	‘flower’

¹The position of Rotuman within the Central Pacific branch is well-established and uncontroversial, in spite of the fact that den Dikken (2003:1) writes: “Rotuman is a Polynesian SVO isolate...” While the Polynesian languages are also members of the Central Pacific branch, Polynesian is a subfamily of which Rotuman is not a member. The use by den Dikken of the phrase “a Polynesian SVO isolate” is unfortunate, given that “isolate” in the technical sphere of language classification carries the meaning “not known to be related to any other language”, thus inviting a (mis)interpretation of what den Dikken has written as meaning something like “a genetically unaffiliated language of (geographical) Polynesia.”

Den Dikken’s confusion about ‘Polynesian’ languages is more dramatically put on display when we read his assertion (2003:58) that Malagasy is “another Polynesian language, genetically unrelated to Rotuman.” Since, as can be clearly seen in the quote above, den Dikken seems to believe that Rotuman is also ‘a Polynesian language’, it would seem to follow that regarding either Rotuman or Malagasy (or both) he must be using the term ‘Polynesian’ geographically, rather than linguistically (since otherwise, how could both languages be ‘Polynesian’, but ‘genetically unrelated?’). Unfortunately, Rotuma is generally considered to be geographically part of Melanesia (like Fiji), rather than Polynesia, and Malagasy is, of course, spoken on Madagascar, thousands of miles from Polynesia. In fact, Malagasy is a member of the Austronesian language family, like Rotuman, and thus den Dikken’s “genetically unrelated” is simply wrong. Malagasy is a member of the Borneo-Philippines subfamily of Austronesian.

- (4) As can be seen from the table in (3), a variety of mechanisms regulate the phonological relationships between the phases (vowel deletion in the first set, umlaut + vowel deletion in the second set, metathesis in the third set, and these are merely examples, there are other possibilities as well). As the examples of ‘sleep’ and ‘embark’ show, the Complete Phase form must represent the underlying representation of the morpheme in question (since the Complete Phase form of these words is *not* predictable from the Incomplete Phase form, but the Incomplete Phase form is predictable from the Complete Phase). As ‘paper’ in the third set shows, even loanwords display the alternation, which is pervasive. We will not be concerned about the precise phonological *form* of the phase distinction today.
- (5) While a fuller consideration of the ‘conditions of use’ of the two phases must await some further discussion of background issues, the most salient and easy to grasp distinction (and thus the one seized onto with the greatest ease by Western analysts) can be seen in the data in (6), which shows that the phase distinction relates in some way to ‘definiteness’ issues.
- (6) Some phase distinctions of *vaka* ‘canoe’ and *fisi* ‘white’:
- (a) *vak* ‘canoes’ (indef. pl.) vs. *vaka* ‘the canoes’ (def. pl.)
- (b) *vak fisi* ‘white canoes’ vs. *vak fisi* ‘the white canoes’

II. Solutions predating den Dikken (2003)

- (7) The Semantic Conditioning Solution (Churchward 1940:96 et passim)

§III.16.1. To what extent, if at all, can we discover an underlying unity behind the various rules that govern the respective uses of the two phases?

§III.16.2. It appears to me that all the rules except the sixth can be subsumed under the following principle: that, in general, the complete phase indicates some kind of completeness, the incomplete phase some kind of incompleteness.²

- (8) Churchward’s (1940) ‘Solution’ has been the one generally adopted in modern work on Rotuman, including work by phonologists on the phonological details of the alternation. For example, McCarthy (1995), which builds upon most of the generative research on the issue, states that “Rotuman has a contrast in major-category words between two phases, the complete and the incomplete, distributed according to syntactico-semantic principles.”
- (9) The Phonological Conditioning Solution (Hale & Kisson 1998)
- The phases are the epiphenomenal by-product of regular phonological processes.
- (10) This ‘phonological conditioning’ approach is adopted from Hale & Kisson (1998) by some more recent analyses, e.g., McCarthy (2000).

²Churchward (1940:88-89) gives six rules for the distribution of the phases, the details of which we shall consider as necessary below. His ‘Sixth Rule’, which he mentions here as an exception to the general principle he seeks to invoke, requires that the personal pronouns and *seia* (‘who(m)’) unexpectedly show the Complete Phase after the prepositions ‘e and se, and the Incomplete Phase in all other positions.

- (11) Just to show you how such an analysis might work, consider the following forms, derived via affixation from *tole* ‘carry’ and the suffixes *-me* ‘hither’ and *-’oki* ‘causative’. We will derive the words in the form they would be cited if elicited from an informant—i.e., prepausally, when they would show up in their incomplete phase form. However, we will be most interested in the phase alternations on the verb *tole* rather than on the word as a whole at this point.
- (a) *tole* ‘carry’ + *-me* ‘hither’ → *tolem* ‘carry hither’ [*tole* in its Complete Phase]
- (b) *tole* ‘carry’ + *-’oki* ‘causative’ → *tol’æk* ‘to make carry’ [*tole* in its Incomplete Phase]³
- (12) This data manifests the two ‘phases’ of *tole* ‘carry’ with no contrast in the definiteness associated with the semantics of that element—i.e., this contrast in phase appears to go completely unaccounted for by Churchward’s ‘semantic’ analysis in (7)—and by all similar ‘semantics-based’ analyses.
- (13) If we turn our attention instead to the phonological details, the basic idea emerges that one builds binary strong-weak feet from right-to-left, and that the vowels at the right edges of weak feet normally delete. Thus:
- (a) (to)[*leme*] → *tolem*
- (b) [*tole*][’*oki*] → *tol’æk*
- (14) To explain the data in (6) above, Hale & Kisson (1998) posit a definite determiner D-element which is segmentally underspecified, but moraic (like a massively underspecified vowel, e.g.). This element is final in its phrase (DPs in Rotuman are D-final when the D is non-null, and thus presumably should also be D-final when the D is segmentally underspecified) and is enclitic to the word which precedes it. So the actual representation of the elements in (6), before phase formation, are as in (15).
- (15) Deriving the effects in (6) [remember that the moraic element D will count for foot construction, but will delete, like all moraic nuclei, when at the right edge of a foot]:
- (a) indefinite plural: [*vaka*] → *vak*
 definite plural: (*va*)[*ka D*] → *vaka*
- (b) indefinite plural: [*vaka*] [*fisi*] → *vak fis*
 definite plural: [*vaka*] (*fi*)[*si D*] → *vak fisi*
- (16) Note that, in anticipation of the discussion to follow, the phase distinction does not bear responsibility for the semantics of definiteness marking under such a scenario: the semantics of definiteness enters the derivation via the presence in the numeration of the definite determiner D. The D has phonological content (since it is moraic), and it is the *phonological*, not the *semantic*, content of D which is responsible for the Complete Phase showing up in the word to which D is attached (via cliticization). D thus acts exactly like *-me* in (11a),

³The Incomplete Phase form of the causative suffix shows the effects of Umlaut.

since in the relevant respects (moraic structure) D and *-me* ‘hither’ are identical: *-me* triggers ‘Complete Phase’ on the elements to which it attaches, and D triggers ‘Complete Phase’ on the elements to which it attaches. The ‘Complete Phase’ is thus only epiphenomenally associated with definiteness.

III. den Dikken (2003)

- (17) den Dikken (2003:1-2) characterizes his study in terms which make it sound very much like a return to the analyses offered by Churchward (1940). He asserts that his study will result in “a fully morphosyntactic analysis of the ‘phase’ distinction in the DP domain.”
- (18) What does ‘a fully morphosyntactic analysis’ mean? Since the phase distinction itself (i.e., the metathesis, umlaut, vowel deletion, etc.) could hardly be handled by the syntax (which doesn’t have computational access to the elements of the representation being manipulated by such processes), one possibility would be that den Dikken intends something like the scenario in (19).
- (19) Derive the Incomplete Phase forms (recall that the Complete Phase forms are identical to underlying forms and thus would require no special derivational machinery) in the ‘morphology’ and feed these created objects into the syntactic computation, which will of course derive from these morphological objects two output representations, one for the articulatory-perceptual interface, and one for the logico-conceptual interface (we’ll abbreviate these as PF and LF respectively in the discussion that follows). Under such a conception, the two created morphological objects would need to differ not only phonologically, but also in their syntactic feature representations, because otherwise the difference between them would not be visible to the syntax, and their could be no ‘morphosyntactic’ analysis of their distribution.
- (20) We don’t believe that the scenario in (19) could ever provide an account of the phase distinctions in Rotuman, because, as we’ve attempted to sketch above, we believe that the conditions which give rise to the phase distinctions involve the post-lexical phonology—i.e., that the conditioning involves phonological strings larger than the lexical item (the entity over which syntactic computation takes place), but, in any event, (19) doesn’t appear to be what den Dikken (2003) has in mind either, as is hinted at by (21).⁴
- (21) Like Hale & Kisson (1998), den Dikken is interested in focussing on the trigger of the phase distinctions, rather than on their form:

⁴For evidence that is greater than just ‘hinting’, one need only consider the fact that den Dikken invokes syntactic cliticization as a factor in determining output phase at a couple of points in his monograph. Since syntactic cliticization (involving ‘special clitics’) cannot take place until *after* syntactic computation has built up the structures out of which cliticization will occur, and since the phase alternations are in part a function of the types of clitic structures that arise in the course of the syntactic derivation, the phases cannot be ‘pre-compiled’ by the morphology and fed *into* the syntactic computation for den Dikken.

For our purposes here, the phonology of the phase distinction will be entirely immaterial. What we are interested in in this work is the syntactico-semantic conditioning of the phase distinction...

Den Dikken appears to have now (on pg. 2, rather than pg. 1, of his monograph) shifted the relevant domain of his account of the phases from *morphosyntax* to *syntactico-semantic conditioning*. Since neither the syntactic representation(s) nor the semantic output representation of a given derivation would seem to exist at the time of morphological derivation in the scenario in (19), those representations could hardly condition any phase distinction generated in the morphology (where we construe ‘derivation in the morphology’ as meaning ‘derivation so as to be fed into the syntactic computation’).

- (22) Is there an architecture of the grammar which would allow the syntactico-semantic conditioning of the phases? Den Dikken in general seems to be assuming a relatively standard minimalist architecture, which we assume works something like (23).
- (23) Take elements from the numeration (or from the workspace of already constructed syntactic objects) and subject them to the operations of Merge and Move (arguably unifiable), iteratively. Either when you are done, or after each step (Epstein & Seely 2006) or at each Phase (not in the Rotuman sense, Chomsky 2005) send the resulting representation to the LF & PF interfaces for evaluation. The derivation converges (i.e., is well-formed) when the numeration is exhausted and no uninterpretable features reach LF and PF.
- (24) It isn’t clear whether *both* the syntax and the semantics have to condition the phases for there to be *syntactico-semantic conditioning* or whether conditioning by either one will do, but either way we can ask the questions independently: under the architectural assumptions in (23) can the syntax or can the semantics condition whether *vaka* or *vak* emerges from the phonology?
- (25) Crucially, if we don’t make the assumptions in (19), where the phases are ‘pre-compiled’ by the morphology, then the numeration can of course only have /vaka/-type forms (i.e., seemingly Complete Phase forms) in it. The phases will be computed post-lexically, i.e., *after* the syntax spells out the final form of the string to PF. So we can rephrase the questions in (24) as in (26).
- (26) (a) If /vaka/ is the only input to syntactic computation, can the syntax condition whether [vaka] or [vak] emerges from the phonology?
(b) If /vaka/ is the only input to the syntactic computation, can the semantics condition whether [vaka] or [vak] emerges from the phonology?
- (27) Let’s take (26b) first. Since a single input form, /vaka/, is introduced to the syntactic computation regardless of whether it emerges as [vak] or [vaka], the semantics, which has no access to forms emerging from the phonology, will never know whether the phonology has computed an output [vak] or an output [vaka]. Since it cannot know what happened

phonologically, it cannot condition what happened phonologically (because it would need to crash if the wrong thing happened, but it can't know whether it did). Put more simply, it is not possible for the LF representation to depend on properties of the PF representation for the proper interpretation of a string, because LF has no access to that representation. Therefore, there can be no *semantic* conditioning of the phase contrast. This fact already makes den Dikken's *syntactico-semantic* a little odd.

- (28) How about (26a)? It is, as far as we can tell, relatively standard to use 'syntactic conditioning' of phonological forms as a shorthand to refer to sequence of events which we believe are pretty universally conceived of as in (29).
- (29) Build the syntactic structure, send the final SpellOut form to PF. PF will construct a rich prosodic structuring of phonological material in the representation it receives from the syntax into prosodic domains (the intonation group, the clitic group, the phonological phrase, the phonological word, etc.). These prosodic domains reference hierarchical information encoded in the syntactic representation, though they are themselves phonological objects. Phonological processes/derivations may be conditioned in part by properties of prosodic domains. *Technically*, these phonological properties are not being conditioned by the syntactic representations (but rather by the prosodic structures which are constructed out of the syntactic representations), but we can, again as a shorthand, call this 'syntactic conditioning' of phonological processes. Is this what den Dikken (2003) has in mind?
- (30) Before we answer this question, let us just note that we shouldn't have to be figuring all of this out. Den Dikken's analysis should be sufficiently clear and explicit that we would *know* from having read his monograph what he means when he says 'fully morphosyntactic analysis' or 'syntactico-semantic conditioning.'
- (31) Returning to the question posed at the end of (29), we can say this. If the difference between [vaka] and [vak] is the result of differences in the positions of /vaka/ in the prosodic structure, then there must be *some other* difference between the *syntactic* structures of the clauses destined to contain [vaka] and those destined to contain [vak], because prosodic structures are constructed from syntactic structures, and the prosodic structures need to be different to trigger the phase distinction.
- (32) The only way to get a difference in syntactic structure is to have a difference in numeration (assuming deterministic computation). So the difference between clauses in which [vaka] emerges and those in which [vak] emerges must have some difference in the set of elements in the numeration. Given this, let's examine a minimal pair of clauses (in 33).
- (33) (a) 'epa la hoa' 'the mats will be taken'
 (b) 'eap la hoa' 'some mats will be taken'
- (34) Ignoring a bunch of null functional heads (like C, etc.) that aren't relevant, the numeration for these clauses must contain /'epa/ 'mat', /la/ 'future tense', and /ho'a/ 'say'. But of course that can't be the whole story, because the phase distinction in the ['epa] vs. ['eap]

contrast must be being conditioned by a prosodic difference, and that difference must depend on a syntactic difference, and that difference must itself depend on a difference in numeration. If we adopt the suggestion of Hale & Kisson (1998), of course, there is a difference in numeration (and a difference in the prosodic structure, in this case the foot structure, built from the syntactic representation constructed from that numeration): (33a) has our moraic D element (a definite determiner) in the numeration, it cliticizes (in the phonology) to /'epa/ in (33a), but not, of course in (33b), since it was not part of the numeration that gave rise to (33b), and it, being moraic, triggered the (e)[pa D] footing which eventually gave rise to 'epa in (33a), as opposed to the [epa] footing in (33b), which of course eventually gave rise to 'eap.

- (35) What's den Dikken's analysis? He summarizes it at the end of the book (2003:73): "Com-marking can be viewed as the realization of a *clitic* in D[+def]." Hmm. Sounds familiar. Bizarrely, he *immediately* follows this complete endorsement of Hale & Kisson's (1998) analysis of how definiteness marking works in Rotuman with this sentence: "Approaches (like Hale & Kisson's 1998, and McCarthy's 2000) which seek to harbour the account of the phase alternation entirely within the phonology will be hard pressed accommodating effects of the type in (123/124), unless they allow their phonology access to a substantial amount of syntactic information." But of course our phonology will need access to no more syntactic information than den Dikken's phonology will: we both need to get the same 'information' to make it from the numeration, through the syntactic computation, to PF.
- (36) The only difference between our analysis and that of den Dikken is that den Dikken never says that his (inaudible) D-head to mark definites is moraic. Indeed, he never tells us *how* such an element can have the effect that it does (preserving Complete Phase, which recall is identical to underlying form), he just asserts that it does.
- (37) Before concluding, we might deal with one issue which may have arisen in the mind of the reader regarding den Dikken's 'syntactico-semantic conditioning' of the phase contrast: how does den Dikken account for the difference in the phase of *tole* which we mentioned in (11) and (12). You will recall that before the monosyllabic suffix *-me* the verb *tole* surfaces in the Complete Phase (thus *tole-m*), while before the disyllabic suffix *-'aki* it surfaces in its Incomplete Phase form (thus *tol'æk*). Is there some special 'syntactico-semantic' factor at play here?
- (38) No, there isn't. Den Dikken's major generalization is his (10) (2003:9), which says "*morphosyntactic* Com(plete Phase)-marking is on the *rightmost* element in the checking domain of D[+def]."⁵ To this statement den Dikken appends the following footnote:

The emphatic restriction of (10) to *morphosyntactic* Com-marking is prompted by the fact that there are cases of Com which the (morpho)syntax arguably has nothing to say about: the instances of Com triggered by phonological properties

⁵Note that the rightmostness requirement follows if we adopt Hale & Kisson's proposal that such Complete Phase marking is triggered by a moraic D-clitic with definiteness semantics, given that DPs are head-final.

of affixes, in particular... See Hale & Kisson (1998) for discussion of this—arguably not a syntactic issue.

- (39) So, den Dikken accepts a phonological analysis of forms such as those in (11), in particular, the phonological analysis proposed in Hale & Kisson (1998), never once showing that that analysis cannot be extended to cover the ‘morphosyntactic’ cases of Complete Phase in which he is interested. His solution to those is to posit a D-clitic to mark definiteness (as do Hale & Kisson 1998), but to leave unexplained how that could trigger the phonological effects we see in phase formation in Rotuman. We see our unified analysis of the phases as much more economical and insightful.

IV. Conclusions

- (40) When doing an analysis, it is easy to be misled by the subtle contrast between the analyst’s (or listener’s) *evidence* that the string should be interpreted in a particular way and the actual derivational source of that interpretation.
- (41) For example, the constituent which precedes the finite verb form in German main clauses has been fronted to the specifier of some high functional head with particular pragmatic semantics associated with it. The head itself is typically null, and thus position to the left of the finite verb is a good indication that the constituent occupies such a high position. But the verb’s position itself has nothing to do with the semantics of the fronted DP.
- (42) Or, consider the ‘floated quantifiers’ in English ‘the men would have all left’ vs. ‘the men would all have left’ vs. ‘the men all would have left’. The presence of the tense and mood elements ‘would’ and ‘have’ act as key sources of evidence for where in the structure ‘all’ is being spelled out (contrast the massive ambiguity in that regard of ‘the men all left’), but the presence of those elements bears no responsibility for the structural placement of ‘all’, nor for its scopal interpretation (which is a function of its structural position, arguably, but certainly *not* a function of what other elements have non-null exponents in the tree).
- (43) Similarly, in Rotuman, the presence of a Complete Phase form at the right edge of a DP is absolutely compelling evidence that *something* has prevented the final vowel of that Complete Phase form from undergoing the loss or metathesis that typically characterizes Incomplete Phase formation. Since no preventor is visible, the element which must have prevented this development must be deleted or null, but the presence of the Complete Phase allows one to assume its presence in the numeration and, indeed, to deduce that it has been merged into that particular DP as its rightmost (and thus head) element. The Complete Phase in this context thus allows one to *recover* the element responsible for the semantics of definiteness, but the phase itself has *nothing* to do with that semantics.
- (44) Hale & Kisson (1998) criticized Churchward (1940) for the ‘romanticism of terminological aesthetics’ which we saw in his belief that ‘completeness of form=completeness of semantics’ and ‘incompleteness of form=incompleteness of semantics’ (see 7 above). We were

particularly dismayed at the degree to which he felt compelled to manipulate concepts of ‘completeness’/‘incompleteness’ in the semantic domain to try to force the facts of Rotuman to fit this preconceived notion. Den Dikken (2003) chides us for the criticism, noting that “Churchward’s inventory of the facts...and his analyses are truly remarkable” and that our criticism seems (to him) to intend “to brush Churchward’s work aside.” The greatest service that we as scientists can perform to honor the hard and careful work of our intellectual predecessors is to try to move that work meaningfully forward. Our conception of the architecture of the grammar and the formal properties of the human linguistic endowment is very different from that of even a highly talented missionary linguist of the early twentieth century (Churchward began his work on Rotuman in 1922). To point out the areas of conceptual weakness (e.g., the overly iconic conception of the nature of the relationship between phonological form and semantic content) is not an insult to Churchward’s scientific work—it is its extension.

- (45) As an exemplification of the outdatedness of Churchward’s views on the nature of linguistic systems and their diachrony, *in spite of* the good work which he was able to do *for his time*, we provide the following extensive passage from his discussion of the diachronic origins of the phase distinction.

§IV.36 But, at whatever period the people of Rotuman first began to drop the final vowel of some words and the invert the final syllable of tohers, one may conjecture, with a considerable degree of confidence, as to how this practice first arose and why both forms of words (both “phases”) have still survived (emphasis added by us).

§IV.37 The incomplete phase arose, no doubt, through the same tendency as has given rise—and still gives rise—to abbreviations of various kinds in other languages, the tendency, namely, to economy of effort...Just as it takes less effort to say “madam” than to say “mea domina,” or to say “don’t” than to say “do not,” so it takes less effort to say *fol* than *folu*, *mös* than *mose*, and *toak* than *toka*: it means one effort or impulse—one expulsion of the breath— instead of two...

§IV.39 As to the question why both phases have survived, instead of the incomplete phase only, the correct answer is, no doubt, because the distinction between the two was found—and is still found—to be a useful one: it is useful for the purpose of language, namely the clear expression of thought...

§IV.41 ...we may say merely that completeness of form came, by degrees, to express completeness of sense, while incompleteness of form came to express incompleteness of sense...

§IV.42 As to the reason why certain suffixes should be attached to the inc. ph. and others to the com. ph., this is perhaps a matter either of euphony or of ease of pronunciation—“economy of effort” again...

We have every confidence that if Churchward were to go to Rotuma today, with the intellectual apparatus of a modern linguist, he would, like us, be highly critical of such claims in

earlier work on Rotuman, regardless of who was making those claims. Respect to Churchward is revealed in trying to develop the best scientific model of the nature of Rotuman that scientific methods allow—a matter that he himself dedicated many years of his life to—, not in blindly following him down the same dead end paths.

- (46) A unified analysis of Rotuman phase is possible if the phases are regulated by the postlexical phonology of the language. Den Dikken (2003), in spite of his rhetoric, fails to offer an empirically adequate account of even a small percentage of the phase alternations present in the language, expands the types of explanation offered in architecturally unclear ways, and represents a violent abuse of Occam's razor.

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