Basic Information

TITLE OF SESSION: Reduplication-Phonology Interactions

TYPE OF SESSION: Symposium

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LENGTH OF SESSION: 3 hours (five 30 minute talks, followed by a 30 minute panel discussion)

Session Abstract

The objective of this symposium is to bring together new research on reduplication — focusing on the question of reduplication-phonology interactions — as a means of better understanding the typology of reduplication, and refining the comparison between current competing theoretical frameworks for the phonological analysis of reduplication. One specific question that will be addressed repeatedly throughout the session is whether Base-Reduplicant (BR) correspondence is a necessary component of the phonological grammar.

Reduplication has played a major role in the development of phonological theory, leading to advances in, for example, Autosegmental Phonology (Marantz 1982, Steriade 1982, 1988, McCarthy & Prince 1986) and Optimality Theory (McCarthy & Prince 1993a,b, 1994, Prince & Smolensky 2004), and serving as the basis for Correspondence Theory within OT (McCarthy & Prince 1995, 1999). Since the 1990’s, there have been numerous proposals seeking to revise various aspects of McCarthy & Prince’s core framework of Base Reduplicant Correspondence Theory [BRCT].

Some of these adhere to the original BRCT framework but seek to eliminate certain elements of the mechanics, like underlying templates or templatic constraints (e.g., Urbanczyk 1996, Hendricks 1999, Riggle 2006). Some of these adopt the core parallelist architecture of BRCT but either modify the details of BR-correspondence (e.g., Spaelti 1997, Struijke 2002) or deny BR-correspondence all together (e.g., Saba Kirchner 2010, Zimmermann 2017, Paschen 2018). Others depart from standard parallel OT, modifying the computational system to accord with one of various OT-derived constraint-based phonological frameworks (e.g., Inkelas & Zoll 2005’s Morphological Doubling Theory, Kiparsky 2010’s Reduplication in Stratal OT, and McCarthy, Kimper, & Mullin 2012’s Serial Template Satisfaction within Harmonic Serialism). Still others represent completely distinct representational and computational systems (e.g., Raimy 2000, Halle 2008, Frampton 2009).

One of the primary points of conflict between these competing frameworks is the empirical and analytical status of different types of putative reduplication-phonology interactions. Beginning with Wilbur (1973), it has been claimed that, cross-linguistically, there is substantial evidence of patterns where phonological processes “misapply” to reduplicated forms. These types of patterns include (but are not limited to):

(i) Underapplication: a process unexpectedly fails to apply in a reduplicant, despite the presence of the normal context for the rule.
(ii) **Overapplication:** a process unexpectedly does apply in a reduplicant, despite the absence of the normal context for the rule.

(iii) **Back-copying:** a process unexpectedly applies to the base, when the context for the rule is met in the reduplicant but not in the base.

The assumed existence of these types of patterns was a key argument in favor of BRCT’s correspondence-based analysis of reduplication. However, many of the subsequent works cited above have challenged the existence of various types of these patterns, based on critiques of the empirical basis of the claimed patterns, and/or the analytical interpretation of the claimed patterns (see especially Inkelas & Zoll 2005 and McCarthy, Kimper, & Mullin 2012).

The revised typology of reduplication-phonology interactions argued for in many of these different works are not fully mutually compatible. The choice between these competing frameworks thus largely rests upon a better, clearer understanding of the typology itself. This requires further assessment of the existing empirical evidence, more refined examination of the analyses themselves and their predictions, and the consideration of new evidence. This session aims to undertake these efforts, in order to clarify the theoretical landscape on reduplication and pave the way for increased consensus in the field.

Steriade’s paper seeks to revisit the claims regarding BRCT. Steriade argues that the empirical evidence does in fact support the bulk of BRCT’s predictions, and that BR correspondence is theoretically parsimonious within the context of numerous other recent theories of Output-Output correspondence (e.g., Agreement by Correspondence, Aggressive Reduplication, Rhyming Domains, etc.).

Zimmermann and Paschen’s papers advocate new theories of reduplication which seek to explain various reduplication-phonology interactions — overapplication for Zimmermann, underapplication for Paschen — without recourse to BR correspondence. Zimmermann argues that viewing reduplication within the framework of Gradient Symbolic Representation allows for an account of the typology of overapplication of markedness reduction in reduplication based on distributed activation between reduplicant and base, and gradient computation of Input-Output faithfulness. Paschen adopts Kirchner’s (2010) framework of “Minimal Reduplication”, where reduplication is the result of copying segment-level phonological material into underspecified prosodic units. Constraints on the association between copied material and prosodic nodes, and disparities in morphological affiliation, derive underapplication effects, again without recourse to BR correspondence.

Zukoff’s paper considers a different type of reduplication-phonology interaction, namely, phonological effects at the base-reduplicant juncture. Using the case study of Ponapean, Zukoff shows that the set of reduplicant shape alternations in the language require that the shape of the reduplicant be determined in a module that has access to the surface properties of the base. This type of grammatical organization is consistent with many reduplicative frameworks (e.g., BRCT and Stratal OT), but is inconsistent with others (namely, Morphological Doubling Theory).

Lastly, Wilson’s paper brings a new sort of contribution to the theoretical literature on reduplication-phonology interactions by developing a computational model which is capable of learning reduplication and its attendant properties. Particularly relevant to topic of this panel, Wilson shows that his model is capable of learning some types of reduplication-phonology interactions (namely, overapplication), but not necessarily all others which have been claimed in the literature.
Detailed Session Information

1. Donca Steriade, Massachusetts Institute of Technology, paper presenter: 
   TBD
   [20 minutes for paper presentation plus 10 minutes for questions]

2. Eva Zimmermann, Leipzig University, paper presenter: 
   Reduplication as Weakening: Explaining the Overapplication of Reduction
   [20 minutes for paper presentation plus 10 minutes for questions]

3. Ludger Paschen, Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS), paper presenter: 
   Underapplication as Trigger Poverty
   [20 minutes for paper presentation plus 10 minutes for questions]

4. Sam Zukoff, Princeton University, paper presenter: 
   Reduplicant Shape Alternations in Ponapean
   [20 minutes for paper presentation plus 10 minutes for questions]

5. Colin Wilson, Johns Hopkins University, paper presenter: 
   Learning Reduplication with Interpretable Deep Networks
   [20 minutes for paper presentation plus 10 minutes for questions]

6. Sharon Inkelas, University of California Berkeley, discussant (and panel moderator): 
   Panel Discussion
   [30 minutes for panel discussion and questions from the audience]

Paper Abstracts

1. TBD
   Donca Steriade, Massachusetts Institute of Technology

The broad theoretical interest in reduplication stems from its potential to disambiguate between competing models of correspondence/faithfulness and grammatical organization. Namely, it presents a clear domain in which to compare a theory of correspondence in which both Input-Output (IO) faithfulness and varieties of Output-Output (OO) faithfulness coexist — as laid out in McCarthy & Prince (1995, 1999), Benua (1997), and others — versus a theory in which the input is mapped to the output in stages, and which, for this reason, posits only a single class of faithfulness constraints — namely, Stratal OT (cf. Kiparsky 2010, 2015), and other stepwise approaches, like Harmonic Serialism (McCarthy 2000 et seq., McCarthy, Kimper, & Mullin 2012).

McCarthy & Prince (1995) — building on pre-OT work like Wilbur (1973), Mester (1986), and Steriade (1988) — presented a rich collection of cases of Base-Reduplicant (BR) identity, with emphasis on the fact that these were (a) hard to analyze in serial terms, and (b) easy to analyze when we distinguish OO (BR) faithfulness constraints from IO faithfulness constraints.

In subsequent literature (esp. Inkelas & Zoll 2005, Kiparsky 2010), many of these cases were reanalyzed, some successfully. Also, attention was drawn to the fact that other predictions of
BR faithfulness remain unverified and look pathological (e.g., the “Kager-Hamilton conundrum”). In part for this reason, the role of OO syntagmatic identity (= BR faithfulness) has been downplayed in much current work on the subject (though not all; cf. Raimy 2011). In this paper, I argue in favor McCarthy & Prince’s (1995) Base-Reduplicant Correspondence Theory model (BRCT). I review evidence that all the predictions of this model are in fact borne out, contrary to recent claims. I show that alternative theories (e.g., those models couched in cophonology theory and Harmonic Serialism) are unable to deal with some of these phenomena. And I show that arguments against BR correspondence have to cope with the fact that the basic OO-syntagmatic identity mechanism is already in use in non-reduplicative systems (e.g., Agreement by Correspondence, aggressive reduplication, rhyming). There is no theoretical simplification to be gained, and much to lose in terms of analytical coverage, by denying the existence of BR Correspondence.

2. Reduplication as Weakening: Explaining the Overapplication of Reduction
Eva Zimmermann, Leipzig University

Reduplicated forms can show symmetrical patterns of reduction, where reduplicant, base, or both show overapplication of reduction processes. In addition, more reduplication within a word increases the likelihood for reduction (i.e., triplication vs. duplication). I argue for a new phonological theory of reduplication which is based on segment fission as sharing of activity that predicts this attested typology of reduction effects in reduplication.

It is an often-discussed property of reduplicants that they show Emergence of the Unmarked effects, where markedness reduction applies within a reduplicant despite being absent elsewhere in the language (McCarthy & Prince 1995, Struijke 2002). Less well-known is the fact that the mirror image distribution can also be found, where only elements that have been copied (= the ‘base’) show reduction: e.g., Salishan (van Eijk 1998, Parker 2011) or Klamath (Kisseberth 1972, Zoll 2002). And crucially, there are also languages that show reduction effects in both base and reduplicant but never outside of reduplicated strings: e.g., Kwakwala (Boas 1947, Kalmar 2003, Saba Kirchner 2010), Hausa (Crysmann 2004, Inkelas & Zoll 2005), or Tagalog (Blust 1976, 2007). Further support for the copying-weakening–correlation comes from the typology of multiple reduplication: some languages show reduction effects only in strings that are copied twice (e.g., Sikaiana; Donner 2012). All this data follows from the generalization that every copy operation gradiently weakens all copies.

The assumption of gradient activity of phonological elements (Smolensky & Goldrick 2016, Rosen 2016) allows us to straightforwardly capture this copying-weakening–correlation under a phonological account of reduplication based on segmental fission (Spaelti 1997, Struijke 2002, Gafos 2003). Under the assumption that all phonological elements have an underlying activation, fission of a segment is taken to be the distribution of its underlying activity unto all its output correspondents: multiple elements corresponding to one input element thus have only a partial activity and are weaker than non-fissioned elements.

In a Gradient Symbolic Representation framework, lesser activity results in gradient constraint violations. Most importantly, elements with lesser activity are only gradiently preserved by faithfulness constraints and reduction is more likely to apply. That multiple copying can result in more reduction falls out naturally, since elements that undergo multiple fission have to distribute their underlying activity amongst more correspondents. More concretely, whereas a single fission
operation results in two output elements with underlying activity 0.5, double fission will result in three output elements with activity 0.33. The gradient weakening of every copy operation thus falls out from the new definition of fission as distribution of activity and gradient faithfulness violations in a Gradient Symbolic Representation framework.

3. Underapplication as Trigger Poverty
   Ludger Paschen, Leibniz-ZAS

Within Optimality Theory, base-reduplicant identity has largely been considered strong evidence in favor of a RED morpheme coupled with a set of base-reduplicant faithfulness constraints as modelled in Base-Reduplicant Correspondence Theory (BRCT; McCarthy & Prince 1995). The notion of the RED morpheme, however, has recently been challenged on empirical grounds (Kirchner 2010); instead it has been proposed that reduplication is a purely phonological process in response to empty prosodic nodes (Kirchner 2010, Zimmermann 2017). Underapplication (i.e., the failure of some independent process to apply in reduplicated forms) presents a recalcitrant problem for either theory. Drawing on data from Lakota (Shaw 1980) and Kulina (Dienst 2014), I will present a new approach to underapplication which lends support to Kirchner’s main claim that reduplication is essentially a phonological repair process triggered by empty prosodic nodes.

At the heart of my approach lies the idea of “trigger poverty”, a concept that is straightforwardly predicted by item-based approaches: if reduplication is phonological copying, this automatically creates an imbalance between triggers (floating features) and potential targets (the copied material). Underapplication may then arise as a function of constraints governing association of phonological nodes, leading to radically different results depending on the trigger-target ratio. In other words, it is the special phonological configuration represented by the presence of copied material, but not its morphological affiliation, that may give rise to a different optimization outcome, viz. underapplication.

Making sense of underapplication as being rooted in phonology strengthens the general argument for a modular architecture of grammar and item-based approaches to morphophonological processes.

4. Reduplicant Shape Alternations in Ponapean
   Sam Zukoff, Princeton University

INTRODUCTION: Ponapean (Austronesian; Rehg & Sohl 1981, Rehg 1993) exhibits a pattern of prefixal partial reduplication which is variable in size, alternating between one mora and two moras in length (McCarthy & Prince 1986, Kennedy 2002). The analysis of this pattern requires that the shape of the reduplicant be calculated in tandem with the surface properties of the base. This rules out frameworks where the reduplicant is calculated without access to the base, such as Morphological Doubling Theory (Inkelas & Zoll 2005).

ANALYSIS: The variation in reduplicant shape in Ponapean is predictable based primarily on the location of stress in the base, which is right-to-left alternating by mora (Rehg 1993, Kennedy 2002). If secondary stress falls on the peninitial mora of the base (even parity bases, e.g. (1)), the reduplicant is monomoraic (except in one particular circumstance, where phonotactics interfere;
cf. (7) below). On the other hand, if secondary stress falls on the initial mora of the base, the reduplicant is bimoraic (odd parity bases, e.g. (2)).

(1) a. tò-tò.roór b. *tò-tò.roór
(2) a. dìuù-dìuù.pék b. *dìuù-dìuù.pék

I argue that this distribution can be explained by the interaction of three factors:

(3) A default preference for monomoraic reduplicants
(4) A requirement that the reduplicant to bear stress
(5) A ban on moraic clash

Just in case stress falls on the initial mora of the base (2), stressing a monomoraic reduplicant would result in a clash (2b). To avoid the clash, the reduplicant is extended to two moras (2a).

In this paper, I lay out an OT account of this reduplicant-shape alternation, as well as additional alternations which result from phonotactic issues (cf. McCarthy & Prince 1986, Kennedy 2002).

RAMIFICATIONS: The significant theoretical result is that this analysis is only possible in a framework in which the shape of the reduplicant is calculated in a module which has access to the surface shape of the base. This is because reduplicant shape depends on the position of grammatically assigned prominence on the base, and (crucially) the position of prominence on the reduplicant does not always match its corresponding mora in the base.

This is the case in (6), where an even parity stem has a clear base-reduplicant stress mismatch because of the preference for monomoraic reduplicants. This is also the case in (7), where phonotactic constraints (including a dispreference for adjacent identical light syllables) motivate extending the reduplicant to two moras; this results in a base-reduplicant stress mismatch as well.

(7) a. riì-ri.àa.lá b. *riì-ri.àa.lá, *ri-ri.àa.lá

This means that underlying properties of the base are insufficient to generate the surface shape of the reduplicant. Furthermore, the shape of the reduplicant cannot be determined by general processes that apply to the entire reduplicated word. This is therefore a type of base-reduplicant junctural phonology which cannot be accounted for in theories in which the shape of the reduplicant is calculated in isolation from the base, such as Morphological Doubling Theory (Inkelas & Zoll 2005).

5. Learning Reduplication with Interpretable Deep Networks
   Colin Wilson, Johns Hopkins University

In spite of its importance for theories of prosodic morphology and the phonology-morphology interface, and in contrast to related phenomena such as prosodic parsing and fixed affixation, reduplication has received little attention in computational modeling of phonological/
morphological learning (but see Frank & Tenenbaum 2011, Dolatian & Heinz 2018, Prickett, Traylor, & Pater 2018). In this talk, I present a deep neural network model that can learn a variety of reduplication patterns — including full copying, partial copying, melodic overwriting, and limited base-reduplication interactions such as over-application — from <input, output> pairs such as <deep, deepshmeep>.

The network model contains several layers that are functionally specialized for primitive phonological and morphological operations, such as identifying matches to phonological environments, applying featural and other changes, delimiting prosodic units, locating points of affixation, and concatenating segments from multiple sources into a single output form. The only reduplication-specific component of the model is a full-copy operation (Marantz 1982, Steriade 1982, 1988) that is implemented by identity-matrix multiplication and can be applied at multiple points relative to the other levels of processing. Because all of the computations in the network are differentiable, it allows reduplication to be learned, along with other phonological and morphological operations, with domain-general algorithms such as stochastic gradient descent.

This model contributes to the long-standing goals of unifying reduplication to the extent possible with other components of the grammar and of developing an explicit, modular theory of phonological/morphological computation and learning.

References


Saba Kirchner, Jesse. 2010. Minimal Reduplication. PhD Dissertation, UCSC.


