A syntactician's view of reduplication

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The main claim of this paper is that reduplication is an affix added in the syntax. This allows reduplication to be able to target not only phonologically defined domains but also syntactically defined domains. Further, I suggest that the domain of reduplication will vary within a language depending on where in the syntax this affix is added. This view of reduplication, then, can provide an additional probe into syntactic structure.

Reduplication is generally a topic for phonologists and morphologists—syntacticians only approaching it by accident when the reduplicative morpheme encodes something relevant for syntax such as a categorial distinction (adjective vs. adverb) or reciprocal formation. However, as morphology has recently become important in the determination of syntactic structure following proposals such as the Mirror Principle (Baker 1985) and Distributed Morphology (Halle and Marantz 1993), many phenomena that previously were restricted to the domain of morphology have come under the investigation of syntacticians. Here I raise the related questions: what can syntax learn from reduplication and what can reduplication learn from syntax. I argue that if we view reduplication as an affix added in the syntax and whose form can give an indication of its domain, we can use it as a probe into syntactic structure.

1. Question: Why is a syntactician interested in reduplication/morphology

In this section, I give a short overview with examples of why a syntactician should pay attention to word-internal structure and therefore include investigation of morphemes (including reduplication) in an investigation of phrase structure. As we will see, it is not necessarily the case that reduplication will provide the same sort of information as non-reduplicative affixation. In some ways it is more helpful and in some ways it is less helpful. Both sides of this issue will be discussed in the paper.

* Not being a phonologist or a morphologist, I relied heavily on the help of others in preparing this paper. I would like to mention in particular Mark Baker, Jonathan Bobaljik, Heather Goad, Glyne Piggott and Douglas Pulleyblank - all of whom had important contributions but should in no way be held responsible for the content of the paper. Further I thank Claire Lefebvre, Heans Paul and Asya Pereltsvaig for passing on interesting reduplication facts to me. Finally, I thank the Malagasy project (SSHRC 410-98-0452) and the Syntax Project (PCAR97ER0578) for providing an audience and funding for preliminary versions of this talk and the audience at AFLA VI for its input.
1.1 Why a syntactician is interested in morphology in general

Since the proposal of the Mirror Principle, morphology has become important to the study of phrase structure.

1. The Mirror Principle (Baker 1985:375)

Morphological derivations must directly reflect syntactic derivations (and vice versa)

There are times when morphological derivations, as represented by morpheme orderings, can give us clues to syntactic structure, in particular the hierarchical order of syntactic heads. An example of this from my work is given below.

In French, to form the infinitive, in general one of three infinitival suffixes is attached to the verb root (orthographically -er, -ir, -re). To form the imperfect, a tense suffix with agreement morphology is added. To form the conditional, the imperfect tense suffix with the agreement morphology is added to the infinitival form. This is illustrated in (2).¹

2. French morphology:

<table>
<thead>
<tr>
<th>verb form</th>
<th>gloss</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>sort</td>
<td>'go out'</td>
<td></td>
</tr>
<tr>
<td>sort-ir</td>
<td>'go out-INF'</td>
<td>'to go out'</td>
</tr>
<tr>
<td>sort-ions</td>
<td>'go out-IMPERF-1PL'</td>
<td>'we were going out'</td>
</tr>
<tr>
<td>sort-ions</td>
<td>'go out-INF-IMPERF-1PL'</td>
<td>'we would go out'</td>
</tr>
</tbody>
</table>

Leaving aside the question of where and how agreement occurs, we can see that we can have a form which contains both the infinitival suffix and the imperfect suffix with the former being added to the root before the latter. I have claimed that this morpheme ordering argues for a tree of the type given in (3) where the tense (and agreement) morphemes are generated in (or checked in) a T head and the infinitival morpheme is generated in (or checked in) a syntactic head between T and V which I have labelled E for Event.

¹ The following abbreviations are used in the glosses of this paper:

cop reduplicative affix
DV Dative Voice (Kroeger)
GEN genitive
IMPERF imperfective
INF infinitive
NOM nominative
PERF perfective
PL plural
SG singular
ST subject topic
TT theme topic

Some abbreviations come from the cited sources and show a difference in the glossing, particularly of the verbal morphology: What is ST (subject topic) and DOT (direct object topic) for Carrier-Duncan is AV (active voice) and DV (dative voice) for Kroeger and AT (actor topic) and TT (Theme Topic) for me.
The details of this analysis are not important for the present paper. The point is that morphology can be used by a syntactician as an argument for phrase structure.\textsuperscript{2}

\textbf{1.2 Why a syntactician is interested in reduplication in particular}

Reduplication affixes, like other affixes, can be used to argue for phrase structure in the same manner. In Travis (1991, 1992) I have used a reduplicative aspectual morpheme in Tagalog to argue for a non-lexical category, Aspect, within the VP. The argument is as follows. First, we must note that there is a lexical causative morpheme in Tagalog as the pairs in (4a) and (4b) show. In (4c) we can see the morpheme analysis that I take from MacLaughlan (1989) where the \textit{-um-} infix found in the intransitive form and the \textit{m-} prefix found in the transitive form are taken to be allomorphs.

4. Alternations in Tagalog
   a. \texttt{tum-tumba} X fall down  \texttt{mag-tumba} Y knock X down
      \texttt{s-um-abog} X explode \texttt{mag-sabog} Y scatter X
   b. \texttt{m-tumba} \texttt{m-pag-tumba}
   c. \texttt{m-sabog} \texttt{m-pag-sabog}

   I assume that \textit{pag-} is in 'little v' in the sense of Chomsky (1996). We therefore have phrase structure tree as in (5) below (where I assume, for reasons irrelevant here, that the topic marker \textit{m-} is in E).

\textsuperscript{2} Cinque (1999) provides an extreme example where the cross-linguistic inventory of morphemes is used as part of an argument for a universal hierarchy of functional categories.
5. 

Now we can look at the position of the reduplicative morpheme in Tagalog which signals incomplete aspect. There are two aspectual morphemes in Tagalog which I will call inner and outer aspect. Outer aspect (realized as either the infix -in- or the prefix n-) has semantic scope over the beginning point of the event and indicates whether or not it has started, inner aspect (realized as CV reduplication) has semantic scope over the endpoint of the event and indicates whether or not it has been completed.

6. Aspect in Tagalog

<table>
<thead>
<tr>
<th>Aspect1 (outer aspect):</th>
<th>+/-start</th>
<th>+start</th>
<th>-in-/n-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect2 (inner aspect):</td>
<td>+/-incomplete</td>
<td>+incomplete</td>
<td>reduplication</td>
</tr>
</tbody>
</table>

In (7) below we can see how these morphemes are added to the lexical causative of the root tumba 'fall down'. The form that is most useful to us is the imperfective 'to be knocking down') which contains both affixes – the inner aspect reduplicative affix appears on the root while the outer aspect appears on the lexical causative morpheme pag-. This is shown schematically in (7b).

7. a. start incomplete

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>nagtumba</th>
<th>Imperfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>nagtumba</td>
<td>Perceptive</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
<td>magntumba</td>
<td>Contemplated</td>
</tr>
</tbody>
</table>

b. magntumba n - m - pag - RED - V

Aspect1 - E - pag - Aspect2 - V

To represent this in phrase structure, I have proposed that there is an Aspect projection within the VP as shown in (8) below.
The line of argumentation above illustrates how reduplication can be used by a syntactician to support syntactic claims. The position of reduplication may be used to indicate the placement of a syntactic head. However, this type of argumentation only works if reduplication behaves like (most) other morphemes – that is, it appears in a fixed position that can tell us something about syntax. In the next section I question whether the placement of reduplication is predictable enough to be used in syntactic argumentation.

2. Is reduplication like other morphemes?

Marantz (1982), in a seminal work on reduplication, argues that reduplication is only minimally different from other morphemes. Like other morphemes, it has a fixed form, however this fixed form shows up only in its template (for instance CV or CVCV) but it must find the content of this template elsewhere. In his closing paragraph, he writes:

At first glance, reduplication seems a rare bird among morphological processes, an exotic curiosity. Struck by the apparent novelty of reduplication, previous investigators have treated reduplication as a special case – and were confronted with problems as a result. Beginning with the assumption that reduplication is minimally different from processes we are accustomed to, I have not only constructed an elegant account of reduplication and its properties but have also been able to illuminate important issues in phonology and morphology. When we recognize that the same theory must cover the duckbill platypus as well as the house cat, we gain a deeper understanding of both the platypus and the cat.

Marantz (1982:480)
While it is certainly tempting to want to make reduplication fit squarely into the class of normal affixes, there are reasons that suggest it has to be treated differently. In the remainder of this paper, I explore the possibility that reduplication, in certain cases, differs from other affixes in both form and function.

2.1 Difference in form

Reduplication differs from other affixes in form in the obvious way that it must copy its content from its target. However, it differs in form in other ways. I will start the discussion by going back to Tagalog reduplication. While in the simple cases discussed above, the reduplicative aspeclual affix targets the root, in more complex forms, reduplication can occur on something other than the root. Some examples of this taken from French (1988) are given in (9) below.

9. Aspectual reduplication in Tagalog

<table>
<thead>
<tr>
<th>stem</th>
<th>meaning</th>
<th>syllable</th>
</tr>
</thead>
<tbody>
<tr>
<td>trabahoh</td>
<td>'work'</td>
<td></td>
</tr>
<tr>
<td>mag trabahoh</td>
<td>'work'</td>
<td></td>
</tr>
<tr>
<td>mag t(r)a trabahoh</td>
<td>'is working'</td>
<td>Root</td>
</tr>
<tr>
<td>makapagtrabahoh</td>
<td>'can work'</td>
<td></td>
</tr>
<tr>
<td>ma ka kapa</td>
<td>'is able to work'</td>
<td>2nd syllable</td>
</tr>
<tr>
<td>or: makapag t(r)a trabahoh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>magpatrabahoh</td>
<td>'make work'</td>
<td></td>
</tr>
<tr>
<td>mag pa patrabahoh</td>
<td>'is making work'</td>
<td>2nd syllable</td>
</tr>
<tr>
<td>magpakatrabahoh</td>
<td>'work very hard'</td>
<td></td>
</tr>
<tr>
<td>mag pa pakatrabahoh</td>
<td>'is working very hard'</td>
<td>2nd syllable</td>
</tr>
<tr>
<td>mag sipagtrabahoh</td>
<td>'they work together'</td>
<td></td>
</tr>
<tr>
<td>mag si sipagtrabahoh</td>
<td>'they are working together'</td>
<td>2nd syllable</td>
</tr>
</tbody>
</table>

Clearly reduplication is appearing in different places on different forms. In addition, there are cases where there is a choice as to where reduplication can appear. In French's discussion, she stresses that there are two different targets, either the second syllable or the root though in data presented in other papers, the variation is wider (for example Rackowski 1999). Without even knowing all the details, the fact that there is variation in position clearly raises the question of whether reduplication can tell us anything about syntax. In this way, reduplication
may be less helpful than we would like. I leave this as a problem here (but see Rackowski (1999)) and turn to the question of the function of reduplication.3

2.2 Difference in function

One of the first things that strikes one working on reduplication is the commonality of the uses of reduplication – again suggesting that it is quite different from other affixes. The same meanings keep reappearing - plural nouns, iterative events, intensive, moderate, wh-X-ever, reciprocals. Moravcsik (1978) argues, by showing that there is no common denominator to all cases of reduplication, that the function of reduplication cannot be collapsed into one - even very abstract - meaning. While she is right, by giving up we also give up the observation that in many cases unrelated languages use reduplication for the same things (see her article for an impressive array). I would like to claim that many cases of reduplication can be seen as quantificational and that these cases of reduplication do, in fact, link form to function and that this function of reduplication is represented in its syntactic position which is encoded in UG in some way.

A response to this claim could be that reduplication is simply iconic and that it is this iconicity alone (and not UG) that accounts for the similarity of uses across language families. In the next section I will discuss briefly why I believe that reduplication is not iconic and what I think at least some reduplicative structures reflect.

2.2.1 Reduplication is not iconic

While it might be tempting to say the reduplication is iconic, I believe that there are reasons to believe it is not. First, if it were simply iconic, it is not clear how it could mean both intensive and moderate. Further, it seems that to be truly iconic, we would expect the intensive reduplication to be, in some sense, bigger than the moderate reduplication. In fact, in Tagalog, it is just the opposite. On a verb root, the domain of the moderate reduplication is a foot while the domain of the intensive reduplication is a syllable as shown below.

10. a. Tagalog moderate (S&O:340)
   mag - dup₃ - Base
   walis magwaliswalis 'sweep a little'
   lalak maglalaklalak 'walk a little'

3 Rackowski (1999) suggests a solution for the placement of aspecual reduplication in Tagalog that assumes that it is introduced in the Aspect head but can appear on higher projections.
b. Tagalog intensive (S&O:337-8)
   mag - dup₁ - Base
   lutu' maglutu' 'cook (repeatedly)'
lakad maglakad 'walk (repeatedly)'

Secondly, if it were iconic, one could imagine that intensive could become increasingly intensive with additional reduplication as in the English 'I am very very tired'. Generally, however, reduplication only allows two copies of the material.

Finally, it clearly does not mean just two instances of something though it is represented by two instances of something. One way to show this is in a language such as Hopi which uses reduplication for plural and a different affix for dual. The relevant examples are given in (11) below. Dual is indicated by the suffix -vit and plural is indicated by reduplication of a syllable.

11. Hopi:
   dual: N-vit maana 'girl' maanavit '2 girls'
   plural: szu saaqa 'ladder' sasaaqa 'ladders' (more than 2)

The use of reduplication in Tagalog reciprocals also has the meaning of more than two. In what Schachter and Otanes (1972:342) call 'multiple reciprocal events', reduplication is used with reciprocals to indicate more than two participants (which can be taken to mean more than two events).

12. magkita 'see one another (two or more actors)'
magkitakit 'see one another (more than two actors)'

Therefore, while in form reduplication is usually restricted to two items, in meaning it is perhaps never restricted to two items.

2.2.2 Reduplication is syntactic iteration

Reduplication, in function, appears to be more like iteration as discussed in Pi (1995). Pi discusses cases of iteration which are represented via subordination of one constituent within another. In the case shown below, a PP has been subordinated within another PP and the resulting meaning is one of iteration.  

13. The butterfly fluttered from flower to flower.

Importantly, it does not indicate movement from exactly one flower to exactly one different flower – rather there is a sense of undetermined iteration. I would argue

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4 I thank Mark Baker for helping me find the language that fit this description.
5 See Pi (1995) for details of this as his proposed structure is different from the one I suggest.
that such embedding is one way to express iteration and reduplication is another way. 6

3. What reduplication can tell us about syntax?

In this section I want to support the claim suggested above that reduplication has to be added in the syntax. By making such a claim, we cannot only collapse many forms of reduplication, we can make reduplication sensitive to its placement on the syntactic tree. In the course of the discussion I will be exploring the following two hypotheses.

14. Hypotheses:
   (i) Quantifying reduplication is expressed in syntax
   (ii) Where reduplication occurs in the syntax will determine form and meaning

3.1 Reduplication is expressed in syntax

McCarthy and Prince (1986) have shown that reduplication can have different phonological domains of reduplication.

    Wd    'prosodic word'
    F    'foot'
    σ    'syllable'
    σ₟    'light (monomoraic) syllable'
    σₚ    'heavy (bimoraic) syllable'
    σₓ    'core syllable'

While these cases can all be said to target phonological domains, there are also cases which appear to target syntactic domains. These fall into two types. The first type which has been discussed in the literature consists of cases where it seems that reduplication targets a syntactic structure, but the form created must feed back into the lexicon. Two examples of VP reduplication are given in (16) and (17) below.

   a. jagunjagun 'warrior' (jù 'fight'; ogun 'war')
   b. sódodosódodo 'truthful person' (sọ 'speak'; ódodo 'truth')

6 In work in progress (Travis in preparation) I discuss the use of both types of structures for event interaction in the case of reciprocal constructions. Malagasy uses the embedding structure while many languages including Madurese (Davies 1999) use reduplication for reciprocals.
   a. Agentive N formation:
      \[ wulu - nyini - la = wulunyinina \]
      dog       search for       = dog searcher
   b. whichever N
      \[ wulu o wulu = \text{'whichever dog'} \]
      \[ wulunyinina o wulunyinina = \text{'whichever dog searcher'} \]

In (16) we see a verb and its object being reduplicated to get an agentive noun. In (17) we see a verb and its object first forming an agentive noun structure and then being reduplicated to get a 'whichever N'.

The complication of these examples is that the V N combination passes through the morphological component. There is a second type of syntactic reduplication, however, where this is not the case. Below we see an example from Malagasy where the use of syntax in reduplication is clear.

   a. \[ iza \]  'who'
   b. \[ na iza na iza \]  'anyone' 'whoever'
   c. \[ zanak'iza \]  'whose child'
   d. \[ na zanak'iza na zanak'iza \]  'anyone's child' 'whoever's child'

The \[ na ... na \] construction in Malagasy is productive and used for either/or constructions as shown in (19) below.

19. Hita-ko na Soa na Saholy
    TT:see-1.SG na Soa na Saholy
    'I see either Soa or Saholy.'

As (19) shows, this construction can be used with reduplication to create either a negative polarity item or a whichever NP. Given the complexity of the NP in (19c) we can see that reduplication must be able to see syntactic domains as well as phonological domains. Since reduplication must in some cases see syntactic domains, we can collapse all forms of reduplication by having them all added in the syntax and from this syntactic position may target either a syntactic or a phonological domain. What I will explore in the next section is the possibility that the size of the domain targetted depends on the syntactic position of the reduplicative affix.

3.2 The form of reduplication reflects its syntax

Reduplication in Tagalog has a variety of shapes and uses which allows for a study of the interaction of the function and form of reduplication. Carrier (1979) gives
three types of reduplication described in terms of Marantz style templates. In Schacher and Otares (S&O) RA is $\text{dup}_0$, R1 is $\text{dup}_1$ and R2 is $\text{dup}_2$.

20. RA: C V - mag-linis ‘ST (subject topic)- clean’
     [+long] mag-li::linis ‘ST-will clean’
R1: C V - lakad ‘walk’
     [-long] pag-la-lakad ‘walking (gerund)’
R2: CV CC V - ma-tali:noh ‘intelligent’
     [+long] ma-tali::tali:noh ‘rather intelligent’

In terms of McCarthy and Prince’s phonological domains, we can say that RA targets a heavy syllable ($\sigma_m$), R1 a light syllable ($\sigma_s$), and R2 a foot. Further, we can get syntactic reduplication in Tagalog as shown in (21) below. In each case, the whole base is reduplicated independently of its size.

   a. denominal intensive adjective (S&O:225)
      sukla ‘disgust’ sukla na sukla ‘very disgusted’
      awa ‘pity’ awangawa ‘feeling great pity’
   b. intensive adjectives (S&O:231)
      taba ‘fat’ taba ng taba ‘very fat’
      palabasa ‘fond of reading’ palabasa ng palabasa ‘very fond of reading’

The claim that I would like to make is that the form that reduplication takes can determine its meaning. This certainly would ease lighten the acquisition load on the language learner. The idea is that the higher in the syntactic tree the reduplicative morpheme is, the larger the domain that it targets. For example, a reduplicative morpheme closer to the root will reduplicate a syllable while a reduplicative morpheme further from the root will reduplicate a foot, still further a word and still further a phrase.\footnote{There will also be cases where the form of the affix will be determined completely by the phonology as, for example, appears to be what is happening in Nakanai (see Butska 1999). In cases such as these, since the form that the reduplicative morpheme takes is predictable from phonology, no information needs to come from the syntax. In some sense, this language will have only one reduplicative affix (though it may be put to different uses). It is only in languages like Tagalog where a difference in form results in a difference in meaning that the F/FMH can be tested.}

22. Form/Function Mapping Hypothesis (F/FMH)
   The form of a (reduplicative) affix will mirror the function of a (reduplicative) affix.
As we will see below, this can't be true in its strongest form, but when relativized by language and by category, it may offer us some insights to the phrase structure information within a word.

3.2.1 Relativized to language

In its strongest form, the F/FMH would predict that if a reduplicative morpheme means X, then universally it takes form X. But this is clearly not true cross-linguistically. Very quickly one can find examples where a reduplication will have the same meaning but take different forms in different languages. Just a few examples are given below.8

23. Moderate
   a. Malagasy: targets a foot
      *haingana 'quickly' haingankaingana 'somewhat quickly'
      *manga 'blue' mangamanga 'somewhat blue'
   b. Quileute: targets a syllable (Moravcsik 1978:323)
      kwat'it 'he tried' kwat'ita 'he tried a little'
      tle 'stiff' tle eyès 'rather stiff'

24. Denominative adjectives (full of N)
   a. Mokilese: targets a syllable
      dikol 'lump' dikolkol 'lumpy'
   b. Twi: targets a foot
      abó 'stones' abobó 'stony'

25. Repeated action
   a. Malagasy: targets a foot
      *idina N: 'the going down'
      *midina 'to go down'
      manapatatapa 'to cut in many pieces'
   b. Tagalog: targets a syllable (Schachter and Otañez: dup1)
      takad 'walk'
      maglapakad 'walk repeatedly'

8 I am guessing a bit in with these characterizations since the only data I have looked at are in Moravcsik (1978). If these examples are not entirely appropriate, I believe that it would be easy to find other appropriate ones. Even though there are cross-linguistic variations, what is interesting is that there appear to be some consistencies. After an extremely brief search, the domain of reduplication for indefinite pronouns (whichever, whoever, etc) seems to be relatively large. In Malagasy it is a phrase, in Latin it can be two syllables (qui quisquis est 'whoever pl dat' see Gildersleeve and Lodge (1997)) though it is often one (qui quis, qui idque). In the other examples given in Moravcsik (1978) it is also a frequency foot (Sudanese and Khasi). Further, plural seem to have relatively smaller domains of reduplication. In the examples given in Moravcsik, plurals are represented consistently by syllable reduplication (Quileute, Papago, Haasa). Without more data, I can't tell if these are valid generalizations but they are suggestive and may support the claims to be argued for later in this paper.
A less strong version of F/FMH will relativize it to a language. In other words, if reduplicative affix1 sees a larger domain than reduplicative affix2 in a language, then reduplicative affix1 is higher in the tree (further from the root) than reduplicative affix2. Given the example in (26) below, then, since the moderative reduplicative affix targets a foot while the iterative reduplicative affix targets a syllable, the moderative affix should be represented in the syntax outside the iterative affix.\(^9\)

26. a. Tagalog MODERATIVE (S&O; p. 339)
   \[\text{\textit{lakad} 'walk' \textit{maglakadlakad} 'do a little walking'}\]
   b. Tagalog ITERATIVE (S&O; p. 337)
   \[\text{\textit{lakad} 'walk' \textit{maglakad} 'walk repeatedly'}\]

   There are reasons to believe this is so if such hierarchies are universal (as suggested, for example, by Cinque (1999)). In Polish, the frequentative morpheme is added before the \textit{po}- morpheme which has a meaning similar to moderative.

   \[\text{jesc} \quad \text{'eat'}\]
   \[\text{jadac} \quad \text{‘to often eat'}\]
   \[\text{po-jadac} \quad \text{‘to often eat for a while'}\]

   It seems, then, that syntactic configuration may be mirrored in the domain targetted by reduplication.\(^{10}\)

3.2.1 Relativized to extended projection of a category

A second problem arises, however. If, within a language, function can determine form, then we would expect, at least within a language, the same meaning would have the same form. Again reduplication in Tagalog is instructive. As presented in Schachter and Otanes, intensive verbs can be formed with two different types of reduplicating suffixes - one which targets the syllable and one which targets the foot.

\(^{9}\) This may represent something more general. For instance, when Malagasy adds the lexical causative prefix \textit{an}-, it triggers fusion (\textit{an-faisitra} \rightarrow \textit{amaitra}). When it adds the productive causative prefix \textit{an}, it triggers prenasalization (\textit{an-fananto} \rightarrow \textit{ampanasa}). The lexical rule creates fusion, the post-lexical rule creates prenasalization. While one might imagine a language with a lexical rule with prenasalization, or a language with a post-lexical rule of fusion, one would not imagine a language with both. Therefore it seems that the relative hierarchy in the syntax within a language (lexical rules happening lower in the tree than post-lexical rules - see Travis in press) will be reflected in the form (sometimes phonological) of the affixation.

\(^{10}\) Kozlowska-Magregor (1999) argues that the meaning of the frequentative may appear with a variety of scopes but that morphologically and syntactically it is closer to the root than the \textit{po}- morpheme.
   a. mag- σₚ₋ - Base
      *lakad* maglalakad  'walk repeatedly'
      *luto* magluluto  'cook repeatedly'
      *buksan* magbubuksan  'open repeatedly'
   b. magka-F- - Base
      *basag* magkabasagbasag  'get thoroughly broken'
      *sira* magkasirasira  'get thoroughly damaged'
   c. magpaka-(F)-Base\(^{11}\)
      *gutom* magkagutomgutom  'try to become very hungry'
      *yaman* magpakayamanyaman  'try to become very rich'

While it is clear that there is a sense of intensity in all three of these cases, even in the translations we see that the reduplication that targets a foot means something different from the reduplication that targets a syllable. In the cases of (28b) and (28c), the intensification has scope over an adjective within the verb. In fact, in a the part of the S&O grammar which treats adjectives, we see foot reduplication to intensify adjectives. In fact, parallel to (28b) we have adjectival formations of the type given in (29).

29. intensive formation of adjectives: (S&O:234)
   *basag*  'broken'  *basagbasag*  'broken to smithereens'
   *sira*  'ruined'  *sirasira*  'thoroughly ruined'

What we can say, then, is that domains are relativized not only to the language, but also to the extended projection of a category. What is low in the extended projection of the verb (28a) may be high in the extended projection of the adjective. While the details must still be worked out, the tree in (30) should give an idea of how the F/FMH relativized to category would work.

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\(^{11}\) Schachter and Otanes write "Formations that include dupₚ express the effort to attain a relatively higher degree of the pertinent quality than do those that lack dupₚ." (page 339)
30. Adjective domains and Verb domains

The reduplicative affix which intensifies the verb root is internal to the extended projection of the verb. The reduplicative affix which intensifies the adjectival root is at the outermost edge of the extended projection of the adjective. Therefore, by relativizing the F/FMH to category as well as to language, we can explain why some intensification reduplicates a foot while other intensification reduplicates a syllable.

3.3 Syntactic confirmation

The structure in (30) suggests a complex construction for what might be expected to act syntactically like simple verbs. There are, however, further syntactic reasons which suggest that the structure given in (30) above is correct for deadjectival verbs. In particular, there are two ways, the single argument of the deadjectival verb acts like an object, i.e. an internal argument. One has to do with agreement and the other with case.

3.3.1 Agreement

Schachter and Otanes (1972:235) point out that there is subject agreement (represented by reduplication) with deadjectival predicates. Further, they state "unaffixed adjectives are pluralizable only when they are intensified by napaka-". Examples are given in (31) below.
31. Agreement on the roots\textsuperscript{12}

\begin{itemize}
  \item \textit{ganda}
  \begin{itemize}
    \item \textit{maganda} 'beautiful'
    \item \textit{napakagaganda} 'very beautiful'
  \end{itemize}
  \item \textit{bago}
  \begin{itemize}
    \item \textit{bago} 'new'
    \item \textit{napakabago} 'very new'
  \end{itemize}
\end{itemize}

One could say that the derived adjectives like \textit{maganda} (from the root \textit{ganda}) and \textit{napakabago} (from the root \textit{bago}) have embedded an adjective within a verbal projection making the single argument an internal argument as in (30) above. Reduplicative agreement would only target internal arguments explaining why the non-derived adjectives as in (31c), where the single argument is truly external, would not show this type of agreement. This would confirm the claim made by Baker (1996) and Baker and Stewart (1997) that stative verbs having adjectival meaning have a more complex structure than the adjectival counterparts and that the single argument of the stative verb is an internal argument while the single argument of an adjective is an external argument.

Importantly, reduplicative agreement also occurs on the verb when an object has become the subject as described in Kroeger (1991).

32. Object subject agreement (reduplication)

\begin{verbatim}
  P-in-agbu-buks-an niya ang lahat ng mga bintana
  PERF-PL-open-DV
  3.PL.SG(GEN) NOM all GEN PL window
  'She had opened all the windows.'
\end{verbatim}

This confirms that truly internal arguments of the (complex) predicate trigger reduplicative subject agreement on the predicate.

3.3.2 Case

Another interesting quirk of the intensification structures is that object case is often required on the single argument. Schachter and O'nes describe it as follows.

A sentence-initial adjective intensified by \textit{napaka-} sometimes requires, and almost always allows, the replacement of the topic \textit{ang} phrase by a \textit{ng} phrase. This replacement is obligatory whenever the sentence-initial intensified adjective is itself the predicate (i.e., is not a modifier). (S&O: 232)

\textsuperscript{12} Note that intensification here is supplied by the prefix \textit{napaka-} and that the reduplication is encoding plural agreement. In future work I want to look at the interaction of agreement reduplication and intensification reduplication. If the claims made in this paper are correct, we may be able to learn something about the syntactic placement of agreement with respect to other functional heads.
33. a. Napakaganda ng baro
   b. * Napakaganda ang baro
      'The dress is very beautiful'

Once again we see evidence that the single argument of a dejectival predicate is
acting like an internal argument — a conclusion that was independently forced on us
by our hypotheses concerning reduplication.\(^{13}\)

4. Conclusion

While very preliminary, this work suggests that there is a tight correlation between
the syntax and the phonology of reduplication. Within the extended projection of a
category there will be a hierarchy of functions similar to that proposed in Cinque
(1999). If a reduplication is used for more than one of these functions and if
different functions are represented by different forms of reduplication, then we
should be able to predicate which form represents which function. Preliminary work
on Tagalog, which has a variety of forms and functions of reduplication, suggests
that this view of reduplication can lead to further insights into the syntactic phrase
structure of words.

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\(^{13}\) Clearly much more work has to be done here. It is not the case that all internal arguments can
have object case even when they are the single argument of the predicate. Also, more work has to be
done on the differences between verbs and adjectives (see e.g. Baker and Stewart 1997)

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