

# Reduplication in Bengali\*

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*The purpose of this paper is to describe the word-level morphological processes of reduplication in Bengali. The description follows a particular model of morphology called Whole Word Morphology (WWM). In order to describe these processes, a clear distinction between 'pattern' and 'process', suggested in Singh (2003), has been used to expunge mere patterns of reduplication from the description. The paper also argues that WWM can handle the phenomena in question more adequately than some other theories of morphology.*

## **1. Introduction**

Although South Asian languages are known to be rich in reduplication, not too many detailed studies of this phenomenon in individual South Asian languages exist (for some notable exceptions, see Abbi (1992 and Singh 2003)). As reduplication has recently become an important domain of study for morphological theory<sup>1</sup>, it is important to undertake such studies so that these theories can be tested against the rich data made available by South Asia. The purpose of this paper is to attempt to do so by examining the relevant facts of Bengali (a.k.a. Bangla). Apart from being briefly mentioned in Chatterji (1926 (1985) and (1945 (1988)) and in Abbi (1992), to the best of my knowledge reduplication in Bengali has not as yet been extensively studied. For the descriptive task at hand, I shall use the framework of W(hole) W(ord) M(orphology), summarized, with appropriate references, in section-2. I find WWM more adequate than other models of morphology, particularly for Bengali (for reasons spelled out in Bhattacharja (forthcoming)). Although I shall not attempt to provide a justification for the model chosen for the description in section-4 it can be easily found in the publications mentioned in section 2. Moreover, the problems presented by Bengali for other models of morphology I discuss in section-5 necessarily constitute arguments for it.

## 2. WWM: A brief description

According to Ford and Singh (2003:18), WWM views morphology “as the study of formal relationship between words”.<sup>2</sup> They (2003:19) claim that “any morphological relationship between a non-unique pair of words of a language can be described by a rule, to be called a Morphological Strategy (MS) or a Word Formation Strategy (WFS)”. The formulation proposed is given below (reproduced verbatim from Singh (2006:1413-1417)):

“/X/<sub>α</sub> ↔ /X'/<sub>β</sub> where

- a. /X/<sub>α</sub> and /X'/<sub>β</sub> are words and X and X' are abbreviations of the forms of classes of words belonging to categories α and β (with which specific words belonging to the right category can be unified or onto which they can be mapped)
- b. ' represents (all the) form-related differences between /X/ and /X'/ that fall outside of automatic phonology
- c. α and β are categories that may be represented as feature-bundles
- d. the ↔ represents a bidirectional implication (if X, then X' and if X', then X)
- e. the interpretation of /X/<sub>α</sub> is a semantic function of /X'/<sub>β</sub>, and vice versa
- f. ' can be null iff α≠β”

If a lexicon has two pairs of words like *child* ↔ *childish* and *ghoul* ↔ *ghoulish*, the association between these pairs is captured by the morphological strategy /X/↔/X'□□/.<sup>3</sup> It can be, as Martohardjono (1986:22) puts it, “used in subsequent word formation, for example in lexical innovation [e.g. *Benladdenish*], as well as in the analysis of newly encountered items [e.g. *Jihadish*].” (Parenthetically inserted examples here and throughout the paper are mine). Thus exploitations of morphological strategies help the speaker-hearer, as Singh and Ford (2000:305) claim, “bridge the gap between actual words she happens to know and the possible words she can be said to know - actually their existence makes the known merely a subset of the knowable.”

(1) below instantiates a morphological strategy of English for it is licensed by at least two pairs of words based on i) the same formal difference: X/X'□□s ([□□□] is a realization of the prime), ii) semantic relatedness: '/X/-ness' and iii) categorial affiliation: adjective/noun. According to Singh (2006) “morphological complexity is a matter of the analyzability (≠ segmentability) of a word into a variable [*kind*, *bright*]

and a constant [*ness*]” provided, of course, as Singh and Ford (2000:308) put it, “there are strategies that license such analyses.”

- (1) /X/adj ↔ /X□□□□/n ‘/X/-ness’  
 kind ↔ kindness  
 bright ↔ brightness

Strategies are morphological processes which capture, as Ford and Singh (2003:19) argue, “the morphological relatedness amongst the words that happen to be in a lexicon”. The WWM view would be that in any lexicon, a good number of words are formally and/or categorically different and semantically related to each other. Strategies emerge on the basis of the generalization of some complex combination of such formal differences as well as semantic relatedness (cf. Singh, 1992) and the schema /X/α ↔ /X/β based on these generalizations assures that, as Singh (2001:344) claims, “all that needs to be said about word-structure in any language (of any type whatsoever)”.<sup>4</sup>

WWM is a ‘holistic’ theory of morphology because it claims that words have no (non-phonological) hierarchical structure<sup>5</sup>. Singh and Starosta (2003:12) argue that words are “in essence seamless wholes” and therefore, as Ford, Singh and Martohardjono (1997:3) claim, there can be “*No morphological operations on units other than the word.*” Hence, no ‘atomistic’ category smaller than the word, for example, ‘affix’, ‘root’, ‘stem’, ‘lexeme’, etc. can be regarded, as Ford, Singh and Martohardjono (1997:3) point out, “as an object of a morphological enquiry.”<sup>6</sup>

### 3. The distinction between pattern and process of reduplication

Sequences of the following sort have been used as examples of reduplication in the Bengali literature (cf. Chatterji 1988:195-199):

- (2) a. /□□□□□□□□□□/adj ‘fat’  
 b. /□□□□□□□□□□□□/n ‘sounds of birds’  
 c. /□□□□/n ‘father’
- (3) /□□□□□□□□□□/p/adv ‘around’
- (4) /□□□□□□□□□□/n, plu ‘looting, etc.’

- (5) /□□□□□□/adj ‘round and alike’  
 (6) /□□□□□□□□/p/adv ‘always beside’
- (7) /□□□□□□□□□□/ ‘big sounds of gunshot’  
 (8) /□ • ÿ□ • ÿ/ ‘sounds of breaking branches’
- (9) a. /□□□□□□□□/n ‘marriage and similar occasions’  
 b. /□□□□□□□□/n ‘hot drinks’  
 c. /□□□□□□□□/ ‘all the times’

Although reduplication is generally assumed to be a process of word-formation, disagreements prevail regarding whether or not the input of such a process must be a word. For example, according to Abbi (1992), words in (2) can be analyzed back to meaningless sequences like [□□□□□□], [□□□] or [□□□□□□] which have been used as input in a process that she calls morphological reduplication<sup>7</sup>. In her (1992:12) view, “in spite of the fact that the part which is repeated is neither a lexical item nor a constituent of a lexical item”, such a sequence acquires “this status only after it is being reduplicated.” Now, if we accept (2) as complex words obtained from the process of reduplication, we must accept words like /ê□□□ê□/ ‘rod’, /□□□□□/ ‘saliva’, /□□□□□□/ ‘dew-drops’, /□ • □ÿ□ • □/ ‘lantern’, /□ • □□ • □/ ‘sandal wood’ as examples of reduplication. But these words are unanimously accepted as simplex words and no one has ever claimed that they result from the iteration of sequences like [ê□], [□□□], [□□□], [□ • □] or [□ • □]. As the status of ‘things’ from which the words in (2) are said to be derived is extremely dubious, none of these words can really be claimed to have been obtained through the process of reduplication.

The difference between WWM and other theories is that whereas according to WWM both the input and the output of a morphological process must be word, most other theories require only the output to be a word.<sup>8</sup> As Singh (2003:156) puts it, “*Tomato* must be ruled out as an example of reduplication because neither *toma* nor *mato* are words in English.” Therefore, a reduplicated word must be a complex word formed with an input which is also a word. As none of the words in (2) can be analyzed back to another word, according to WWM they cannot be seen as morphologically complex.

- (10) /□□□□□□/p/adv ‘beside’ → /□□□□□□□□□□/p/adv ‘around’  
 (11) /□□□ÿ/n ‘looting’ → /□□□ÿ□□ÿ/n, plu ‘looting, etc.’

Although (3) and (4) can be analyzed back to simple words neither (10) nor (11) represents a process because the formal difference and semantic relatedness between the pair-mates manifest themselves in no other pair. This means that, as is the case with (2), the speaker-hearer has to memorize both (3) and (4) and once forgotten, morphology cannot help her to retrieve them given the input [□□□□] or [□□ÿ]. On the other hand, (5) and (6) do not need to be memorized because the speaker-hearer can retrieve or form these words by mapping /□□□/ and /□□□□/ onto (12) and (13), motivated by the memory of another pair which manifests the same formal difference and semantic relatedness.

- (12) AASMAD: /C<sub>1</sub>V<sub>+round</sub>C<sub>2</sub>/adj ↔ /C<sub>1</sub>V<sub>+round</sub> C<sub>2</sub>C<sub>1</sub>□C<sub>2</sub>/adj  
 ‘/C<sub>1</sub>V<sub>+round</sub> C<sub>2</sub>/ and alike’<sup>9</sup>  
 /□□□/ ‘round’ ↔ /□□□□□□□/ ‘round and alike’  
 /□<sup>□</sup>□□/ ‘false’, ‘erroneous’ ↔ /□<sup>□</sup>□□□□□□□/ ‘false and alike’, ‘erroneous and alike’
- (13) P/AdvP/AdvSVAD: /X□/<sub>p/adv</sub> ↔ /X□X□/<sub>p/adv</sub> ‘always /X□/’  
 /□□□□/<sub>p</sub> ‘beside’ ↔ /□□□□□□□□□□/<sub>adv</sub> ‘always beside’  
 /□<sup>□</sup>□□□□/ ‘slowly’ ↔ /□<sup>□</sup>□□□□□□□□□□/ ‘always slowly’

For Chatterji (1988) both (2a-b) and (7) are examples of reduplicated O(nomatopoeic) W(ord). But in my view, not all OW that show some sort of iteration of phonemic sequence can be described as examples of ‘reduplication’ if this term denotes a morphological process. Some of them like /□ • ÿ□ • ÿ/ and /□□□□□□□□□□□□□□/ are indeed complex words obtained from the processes like (14) and (15) whereas others like /□□□□□□□□□□□□□□/ (2a) and /□□□□□□□□□□□□□□/ (2b) show only patterns of reduplication because they have access to no strategy.

- (14) OWOWAD: /X/ow ↔ /XX/ow ‘multiplicity of /X/’  
 [□ • ÿ] ‘sound of breaking one single branch’ ↔ /□ • ÿ□ • ÿ/  
 ‘sounds of breaking branches’  
 [ÿ□ • □] ‘sound of one single knocking on the door’ ↔  
 /ÿ□ • □ÿ□ • □/ ‘sounds of knocking on the door’
- (15) OWOWSMAD: /CuX/ow ↔ /CuXCaX/ow ‘multiplicity of /CuX/’  
 [□□□□□] ‘big sound of one single gunshot’ ↔  
 /□□□□□□□□□□/ ‘big sounds of gunshot’  
 [ÿ□□□] ‘light sound of one single gunshot’ ↔ /ÿ□□□ÿ□□□/  
 ‘light sounds of gunshot’

Words like /□□□□□□□□/ (16a) constituted of synonyms: /□□□□/ and /□□□□/ ‘marriage’, /□□□□□□□□/ (17a) constituted of hyponyms: /□□□/ ‘tea’ and /□□□□□□/ ‘coffee’ and /□□□□□□□□/ (18a) formed with antonyms /□□□□/ ‘day’ and /□□□□/ ‘night’ can be related to either of these synonyms, hyponyms and antonyms. But the pairs in (16), (17) and (18) cannot justify a process because the formal difference they manifest can be found in no other pair. However, many other pairs show the same semantic relatedness that exists between the pair-mates of (16), (17) and (18) but semantic relatedness alone does not suffice to justify a process<sup>10</sup>. Again, in order to form such words, for example, the word meaning ‘books and similar objects’ with the input /□ • □/ ‘book’, the speaker-hearer must know a number of synonyms of the latter: /□□□□ • □/, /□□ • □□□□□/, /□□□□□□/. Such synonymy (and also antonymy or hyponymy) motivated constraints on the formulation of a strategy remain unmotivated.

- (16) a. /□□□□□□/ ‘marriage’ → /□□□□□□□□□□/ ‘marriages and similar occasions’  
 b. /□ • □/ ‘book’ → /□ • □□□□□□ • □/ ‘books and similar objects’
- (17) a. /□□□/ ‘tea’ → /□□□□□□□□□□/ ‘hot drinks’  
 b. /□□□□/ ‘coca cola’ → /□□□□□□□□□ÿ/ ‘cold drinks’\*  
 (\**Sprite* is the name of a cold drink)
- (18) a. /□□□□/ ‘day’ → /□□□□□□□□□□/ ‘all the time’  
 b. /□ • □□□□/ ‘morning’ → /□ • □□□□□□□□□□/ ‘all the time’\*  
 (\*/□□□□□□□□/ means ‘afternoon’)

I claim (pace Chatterji 1988 and Abbi 1992) that mere repetition of some phonemic sequence observed in some words cannot reasonably mean that they are examples of reduplication. It is true that reduplication is basically repetition but not vice versa. All the examples mentioned above (2-9) manifest some sort of repetition but only (5-8) are complex words obtained from a ‘processes of reduplication’ whereas the others manifest mere ‘pattern of reduplication’. The distinction is important but unfortunately not made in any work except Singh (2003). Without such a distinction, it is hard to draw a clear line between morphologically complex words and simple words which, for some reason or other, look like complex words but have undergone no morphological process.<sup>11</sup> This said, all processes are basically patterns but not all patterns necessarily qualify as processes because not all of them are justified with at least two pairs of words showing the same formal difference, categorial affiliation and semantic relatedness.

Therefore, (2), (3), (4) and (9) which are traditionally described as reduplicated words cannot be claimed, as it has been clearly shown, to have undergone any morphological process. In order to avoid confusion, such examples are eliminated hereinafter from this discussion. I claim that they have nothing to do with morphology and doubt whether any other theoretical approach can satisfactorily account for them.

#### 4. Morphological strategies and reduplication in Bengali

Like any other word, a reduplicated word can be analyzed into a variable and a constant subcomponent by mapping it onto a relevant strategy. In both (1) and (19), the mechanism involved is adjunction-deletion but the difference between the two is that in (1), the speaker-hearer adjoins or deletes a constant subcomponent (□□□) whereas in (19) he adjoins or deletes the variable itself and this clearly shows that there is nothing special with strategies like (19)<sup>12</sup>.

- (19) AAAD: /X/<sub>adj, sing</sub> ↔ /XX/<sub>adj, plu</sub> ‘plural of /X/’  
 /□ • □□/ ‘big’ ↔ /□ • □□□ • □□/ ‘all big’  
 /□ • □□¾/ ‘green’ ↔ /□ • □□¾□ • □□¾/ ‘all green’

- (20)  $\alpha\alpha$ SMAD:  $/(\text{C})\text{VX}/_{\alpha} \leftrightarrow /(\text{C})\text{VX}\ddot{\text{V}}\text{X}/_{\alpha}$  ‘ $/(\text{C})\text{VX}/$ , etc.’\*  
 $/\square \cdot \square/$  ‘book’  $\leftrightarrow / \square \cdot \square \ddot{\text{y}} \cdot \square/$  ‘books and similar things’  
 $/\square\square\square\square/$  ‘sky’  $\leftrightarrow / \square\square\square\square \ddot{\text{y}} \square\square\square\square/$  ‘sky and similar things’  
 (\* $\alpha$  represents here any syntactic category except conjunction and interjection.)

As is the case with other strategies, the variable can be either i) totally unspecified (19) or ii) partly specified (20). The specification of the variable is a question of degree and as we see below, the variable in (20) is less specified as compared to the variable in (21), which is again less specified than the variable in (22).<sup>13</sup>

- (21)  $\alpha\alpha$ SMAD:  $/\text{XCV}(\text{C})\sigma_1.\sigma_4/n \leftrightarrow / \text{XCV}(\text{C})\sigma_1.\sigma_4 \ddot{\text{V}} \sigma_1.\sigma_4/n$   
 ‘ $/\text{XCV}(\text{C})\sigma_1.\sigma_4/$  and similar things’  
 $/\square\square\square\square \cdot \square\square\square\square/n$  ‘plan’  $\leftrightarrow / \square\square\square\square \cdot \square\square\square\square \ddot{\text{y}} \square\square\square\square/n$   
 or  $/\square \cdot \square\square \cdot \square \cdot \square \ddot{\text{y}} \cdot \square\square\square\square/n$  ‘planning, etc.’  
 $/\square\square^3/4 \square\square\square\square/n$  ‘politics’  $\leftrightarrow / \square\square^3/4 \square\square\square\square \ddot{\text{y}} \square\square\square\square/n$  ‘politics,  
 etc.’
- (22) AASMAD:  $/\text{C}_1 \square \text{C}_2 /_{\text{adj}} \leftrightarrow / \text{C}_1 \square \text{C}_2 \text{C}_1 \square \text{C}_2 /_{\text{adj}}$  ‘perfectly  $/\text{C}_1 \square \text{C}_2/$ ’  
 $/\square \square \ddot{\text{y}}/$  ‘well-dressed’  $\leftrightarrow / \square \square \ddot{\text{y}} \square \square \ddot{\text{y}}/$  ‘perfectly well dressed’  
 $/\ddot{\text{y}} \square \square/$  ‘alright’, ‘okay’  $\leftrightarrow / \ddot{\text{y}} \square \square \ddot{\text{y}} \square \square/$  ‘perfectly alright or okay’

When the speaker-hearer feels the need to form or retrieve a certain word, the only thing he needs to do is to map an already existing word like  $/\square \cdot \square\square/$  or  $/\square \cdot \square/$  onto relevant strategies (19-20) and the latter will automatically output  $/\square \cdot \square\square \cdot \square\square/$  and  $/\square \cdot \square \ddot{\text{y}} \cdot \square/$  respectively and nothing more is needed for word formation. As both the input and the output of a strategy are words, a complex word like  $/\square \cdot \square \ddot{\text{y}} \cdot \square/$  can be formed from the simple word  $/\square \cdot \square/$  or the latter can be back-formed from  $/\square \cdot \square \ddot{\text{y}} \cdot \square/$  (because the bidirectional nature of the strategies allows the speaker-hearer to do so).

Like any other strategy of Bengali, (19-22) transform a simple word  $/\text{X}/_{\alpha}$  into a complex one  $/\text{X}'/_{\beta}$ . Through which particular way or mechanism the formal difference ['] is obtained is not a relevant question for the theory itself and therefore, such strategies do not need to be put in a particular category or given a different name. Therefore, as is the case with atomistic distinctions like Derivation/Inflection (cf. Ford, Singh and Martohardjono 1997) and Derivation/Compounding (cf. Singh and



Dasgupta 1999) or categories like *affix* or *stem*, terms like *reduplication* and categories such as *reduplicant* or *base* have no particular status in WWM.

According to Ford and Singh (2003:19) “The listing of the morphological strategies of a language constitutes a part of the description of that language. It is, therefore, an aspect of linguistic competence, a component of grammar.” With the discussion above as background, I shall now proceed, on the basis of the data available to me, to formulate the remaining strategies of Bengali which, together with the strategies mentioned above, should hopefully yield an exhaustive list of strategies involving repetition of the entire variable or some specified part of it.

- (23) AASMAD: /CX/adj ↔ /CX□X/adj ‘/CX/ and alike’  
 /□ • □□/ ‘big’ ↔ /□ • □□□ • □□/ ‘big and alike’  
 /□□ÿ□/ ‘fat’ ↔ /□□ÿ□□□ÿ□/ ‘fat and alike’
- (24) AAdvSMAD: /CV<sub>-high, +back</sub>X□/adj ↔ /CV<sub>-high, +back</sub>X□CV<sub>+high</sub>X□/adv ‘in a /CV<sub>-high, +back</sub>X□/ way’  
 /□ • □□□/ ‘tall’ ↔ /□ • □□□□□□□□□□/ ‘lengthwise’  
 /□□¾□/ ‘straight’ ↔ /□□¾□□□¾□□/ ‘straightly’
- (25) NNAD: /X/<sub>n, sing</sub> ↔ /XeXe/<sub>n, plu, loc</sub> ‘in each and every /X/’  
 /ê□□/ ‘branch’ ↔ /ê□□□ê□□□□/ ‘on each and every branch’  
 /□□□/ ‘month’ ↔ /□□□□□□□□□□/ ‘in each and every month’
- (26) NNSMAD: /XC/<sub>n</sub> ↔ /XC□XC□/<sub>n</sub> ‘reciprocal action involving two or several /XC/ of different persons’  
 /□□□□/ ‘ear’ ↔ /□□□□□□□□□□/ ‘whispering to one another’,  
 ‘spreading rumours’  
 /□□□□/ ‘hand’ ↔ /□□□□□□□□□□/ ‘hand-to-hand fight’
- (27) NNSMAD: /XVC/<sub>n</sub> ↔ /XC□XC□/<sub>n</sub> ‘fighting that involves exchange of /XVC/’  
 /□□□□ • □/ ‘bite’ ↔ /□□□□□□□□□□□□□□/ ‘biting each other’  
 /□□□□□□□□/ ‘a fall or throw to the ground with force’ ↔  
 /□□□□□□□□□□□□□□/ ‘mutual knocking to the ground as in wrestling’
- (28) NNSMAD: /C<sub>1</sub> • C<sub>2</sub>□C<sub>3</sub>/<sub>n</sub> ↔ /C<sub>1</sub> • C<sub>2</sub>C<sub>3</sub>□C<sub>1</sub>□C<sub>2</sub>C<sub>3</sub>□/<sub>n</sub>  
 ‘continuous and reciprocal instances of /C<sub>1</sub> • C<sub>2</sub>□C<sub>3</sub>/’

- /□ • □□□/ ‘change’, ‘exchange’ ↔ /□ • □□□□□□□□/ ‘several (reciprocal) instances of exchanging’  
 /□ □ • □□□□/ ‘rebuff’ ↔ /□ □ • □□□□□□□□/ ‘several (reciprocal) instances of rebuffing’
- (29) NNSMAD: /CX/<sub>n, sing</sub> ↔ /CX□□□□/ ‘several instances of /CX/’  
 /□□□□□□/ ‘crying’ ↔ /□□□□□□□□/ ‘several instances of crying’  
 /<sup>3</sup>/<sub>4</sub>□ • □□□□/ ‘dispute’ ↔ /<sup>3</sup>/<sub>4</sub>□ • □□□<sup>3</sup>/<sub>4</sub>□□□□/ ‘several instances of dispute’
- (30) NNSMAD: /CX/<sub>n</sub> ↔ /□XCX/<sub>n</sub> ‘/CX/ and similar things’  
 /□□□□□□/ ‘mental state’, ‘mood’ ↔ /□□□□□□□□/ ‘gestures and deportment’  
 /□□□□□□/ ‘manners’ ↔ /□□□□□□□□/ ‘manners and conditions’
- (31) NNSMAD: /XC/<sub>n, sing</sub> ↔ /XC□XC/<sub>n, plu</sub> ‘multiplicity of /XC/’  
 /□□□□/ ‘merchandise’, ‘goods’ ↔ /□□□□□□□□/ ‘several goods’  
 /□□□□□□/ ‘insult’ ↔ /□□□□□□□□/ ‘insults’
- (32) NNAD: /X/<sub>n</sub> ↔ /XX□□□□□□/ ‘/X/ and beyond’  
 /□□□□□□/ ‘forest’ ↔ /□□□□□□□□□□□□/ ‘forest and beyond’  
 /□□□□□□/ ‘far’ ↔ /□□□□□□□□□□□□/ ‘far and beyond’
- (33) NAAD: /X/<sub>n</sub> ↔ /XX/<sub>adj</sub> ‘like /X/’  
 /□ • □□/ ‘bridegroom’ ↔ /□ • □□ • □□/ ‘bridegroom-like’  
 /□□□□□□/ ‘girl’ ↔ /□□□□□□□□□□/ ‘girl-like’
- (34) NAAD: /X/<sub>n</sub> ↔ /X□□X/<sub>adv</sub> ‘/X/ after /X/’  
 /□□□□□□/ ‘day’ ↔ /□□□□□□□□□□/ ‘day by day’  
 /□□□□□□□□/ ‘year’ ↔ /□□□□□□□□□□□□□□/ ‘year after year’
- (35) VNSMAD: /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>/<sub>v, pres imp, 2nd intim/derog</sub> ↔ /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>□C<sub>1</sub>V<sub>+high</sub>C<sub>2</sub>□/ ‘continuous instances of the action asked for in /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>/’  
 /□□□□□□□□/ ‘run!’ ↔ /□□□□□□□□□□□□□□/ ‘running here and there’  
 /□□□□□□□□□□□□□□□□□□□□/ ‘frequent!’ ↔ /□□□□□□□□□□□□□□□□□□□□□□□□□□□□/ ‘act of frequenting’

- (36) VNSVAD: /XC/v, pres imp, 2nd intim/derog ↔ /XCXC/n ‘several reciprocal instances of the action asked for in /XC/’  
 /□□□/ ‘beat!’ ↔ /□□□□□□□□/ ‘several acts of beating each other’  
 /□□□/ ‘seize by force or by tactics!’ ↔ /□□□□□□□□/  
 ‘several reciprocal acts of seizing by force or by tactics’
- (37) VNSMAD: /X□/v, pres imp, 2nd intim/derog ↔ /X□X□/n ‘several (reciprocal) instances of the action asked for in /X□/’  
 /□□□ÿ□/ ‘change!’ ↔ /□□□ÿ□□□□ÿ□/ ‘exchanging something between each other’  
 /□□□□□□/ ‘push!’ ↔ /□□□□□□□□□□□□□□/ ‘several acts of pushing each other’

- (38) VNSMAD: /CV<sub>-high</sub>X□/v, pres imp, 2nd intim/derog ↔ /CV<sub>-high</sub>X□C  
V<sub>+high</sub>X□/n ‘several (reciprocal) instances of the action asked for  
in /CV<sub>-high</sub>X□/’  
/□ • □□□□/ ‘change!’, ‘exchange!’ ↔ /□ • □□□□□□□□□□/  
‘exchanging something between each other’  
/□□□□□□□□/ ‘drag or trail along forcefully!’ ↔  
/□□□□□□□□□□□□□□□□□□□□/ ‘act of dragging or trailing along each other  
forcefully’
- (39) VAdvSVAD: /X□/compl/perf verbal ↔ /X□X□/adv ‘during or after  
continuous instances of action referred to in /X□/’  
/□□□□□□□□/ ‘to write’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘by writing’  
/□□□□□□□□/ ‘having written’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘by writing’
- (40) MWMWAD: /X/MW, sing ↔ /XX/MW, plu ‘multiplicity of /X/’  
/□□□□□□□□/ ‘drop’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘drops’  
/□□□□□□□□/ ‘handful’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘handfuls’
- (41) ααSMAD: /(C)VX/α ↔ /(C)VX□VX/α ‘/(C)VX/ and similar  
trashes’  
/□□□□□□□□/ ‘sky’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘sky and similar trashes’  
/□□□□□□□□/ ‘beside’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘beside and in similar  
other disgusting positions’
- (42) ααSMAD: /XC<sub>1</sub>□C<sub>2</sub>/α ↔ /XC<sub>1</sub>□C<sub>2</sub>ÿ□C<sub>2</sub>/α ‘/XC<sub>1</sub>□C<sub>2</sub>/ and alike’  
/□□□□□□□□□□/ ‘goose’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘goose and alike’  
/□□□□□□□□□□□□□□□□□□□□/ ‘love!’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘love and do  
similar things!’  
ααSVAD: /XC<sub>1</sub>□C<sub>2</sub>/α ↔ /XC<sub>1</sub>□C<sub>2</sub>ÿ□C<sub>2</sub>/α ‘/XC<sub>1</sub>□C<sub>2</sub>/ and  
alike’  
/□□□□□□□□□□/ ‘goose’ ↔ /□□□□□□□□□□□□□□□□□□□□/ ‘goose and alike’

As far as reduplication in Bengali is concerned, the description above allows us to construct a picture of the following sort:

| Distribution of primary strategies involving repetition<br>of (partly specified or totally unspecified) variable <sup>14</sup> |                         |                  |                         |
|--|-------------------------|------------------|-------------------------|
| Morphological operation  | Number<br>of strategies | Type of variable | Number of<br>strategies |
|  |                         |                  |                         |

|  |           |                     |           |
|--|-----------|---------------------|-----------|
| Noun-Noun                                    | 8         | Specified           | 21        |
| Adjective-Adjective                          | 4         | Totally unspecified | 7         |
| Verb-Noun                                    | 4         |                     |           |
| αα   | 4         |                     |           |
| Onomatopoeic Word -<br>Onomatopoeic Word     | 2         |                     |           |
| Verb-Adverb                                  | 1         |                     |           |
| Adjective-Adverb                             | 1         |                     |           |
| Postposition/Adverb -<br>Postposition/Adverb | 1         |                     |           |
| Noun-Adjective                               | 1         |                     |           |
| Noun-Adverb                                  | 1         |                     |           |
| Measure Word -<br>Measure Word               | 1         |                     |           |
| <b>Total</b>                                 | <b>28</b> |                     | <b>28</b> |

### 5. Problematic examples for other morphological theories

In this section, I briefly describe how the phenomenon of reduplication is treated in some other morphological theories and cite some examples of processes of reduplication which seem to be difficult to handle in these frameworks but satisfactorily handled in WWM. For example, the outputs (here and throughout this section output will mean the rightward output only) of (29) (repeated here as (43)) would be problematic for Marantz (1982:436), who considers reduplication as “normal affixation processes” in which, instead of some normal affix, a copy of the phonemic melody of the stem is attached to the stem itself. But as we can see in the outputs of (43), the reduplicational affix [ʒɑ̃ɑ̃ɑ̃] or [ɑ̃ɑ̃ɑ̃] does not represent a copy of the phonemic melody of the stem [ʒɑ̃ • ɑ̃ɑ̃] or [ɑ̃ɑ̃ɑ̃].

- (43) NNSMAD: /CX/<sub>n, sing</sub> ↔ /CXCɑ̃ɑ̃ɑ̃/<sub>n</sub> ‘several instances of /CX/’  
/ɑ̃ɑ̃ɑ̃ɑ̃/ ‘crying’ ↔ /ɑ̃ɑ̃ɑ̃ɑ̃ɑ̃ɑ̃ɑ̃/ ‘several instances of crying’

of / $\frac{3}{4}$ □ • □□□/ ‘dispute’ ↔ / $\frac{3}{4}$ □ • □□□ $\frac{3}{4}$ □□/ ‘several instances of disputes’

O(ptimality) T(heory) treats reduplication with the identity constraint that requires the reduplicant to be as faithful as possible to the base. According to McCarthy and Prince (1995:1) “reduplication is a matter of identity: the reduplicant copies the base” But, the identity constraint is violated in all instances of incomplete reduplication and the reduplicant is more or less unfaithful to the base, a common tendency in South Asian languages (cf. Vijaykrishnan 1999 and Singh 2003). However, violation of constraints is not a problem for OT because all OT constraints are in principle violable. In my view, OT will have difficulties in accounting for the outputs of (20) (repeated here as (44) with different pairs) and (21) (repeated here as (45)) in which different pieces of prosody: [□ • □□], [ỵ • □□ • □□] or [ỵ□□□□ • □□□□□] are affixed to the base resulting in several optimal outputs, a fact that OT can hardly allow.

(44) ααSMAD: /(C)VX/α ↔ /(C)VXỵVX/α ‘(C)VX/, etc.’  
 /□□□□□ • □□□□□/ ‘plan’ ↔  
 /□□□□□ • □□□□□ỵ□□□□□ • □□□□□/  
 ‘planning, etc.’  
 /□□ $\frac{3}{4}$ □□□□□/ ‘politics’ ↔ /□□ $\frac{3}{4}$ □□□□□ỵ□ $\frac{3}{4}$ □□□□□/  
 ‘politics, etc.’

(45) ααSMAD: /XCV(C)σ<sub>1</sub>-σ<sub>4</sub>/α ↔ /XCV(C)σ<sub>1</sub>-σ<sub>4</sub>ỵV(C)σ<sub>1</sub>-σ<sub>4</sub>/α  
 ‘/XCV(C)σ<sub>1</sub>-σ<sub>4</sub>/ and alike’  
 /□□□□□ • □□□□□/ ‘plan’ ↔ /□□□□□ • □□□□□ỵ□□□□/  
 or /□ • □□□ • □□ • □□ỵ • □□□□□/ ‘planning, etc.’  
 /□□ $\frac{3}{4}$ □□□□□/ ‘politics’ ↔ /□□ $\frac{3}{4}$ □□□□□ỵ□□□□□/ ‘politics, etc.’

According to Kiparsky's (2002:395-397) L(exical) P(rosodic) M(orphology) “the size and melody of the base is predictable from the morphology of reduplication” and “the reduplicant gets its form from the base” which “determines both how much of the reduplicated word’s melody (the root, stem, or the whole word) is accessible to the reduplication process, and what the form of the copied melody is.” It would be difficult to account for the outputs of (35) (repeated here as (46)) and (47) within the framework of LPM because several sequences compete for the base-hood in this words. For example, both /□□□ỵ/ and /□□□ỵ□/ can be considered as the base for /□□□ỵ□□□ỵ□/ and /□□□□□□□□/ can be formed with either /□□□/ or /□□□□/. This eventually shows that categories like *base* and *reduplicant* are not easy to

identify. The outputs of (43) also represent problematic cases for LPM because little of the base / $\frac{3}{4}$ □ • □□□/ is apparently accessible to the morphology of reduplication, which means that the base /□□□□□/ or / $\frac{3}{4}$ □ • □□□/ can determine neither the prosody nor the melody of the reduplicant /□□□□□/ or / $\frac{3}{4}$ □□□□□/.

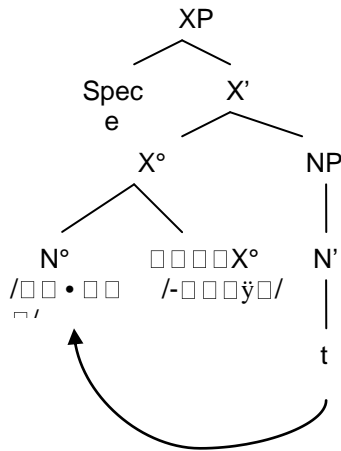
- (46) VNSMAD: / $C_1V_{-high}C_2/v, pres imp, 2nd intim/derog$  ↔  
 / $C_1V_{-high}C_2□C_1V_{+high}C_2□/n$  ‘continuous instances of the  
 action asked for in / $C_1V_{-high}C_2/$ ’  
 /□□□□□/ ‘run!’ ↔ /□□□□□□□□□□□□□□/ ‘running here and there’  
 /□□□□□/ ‘frequent!’ ↔ /□□□□□□□□□□□□□□/ ‘act of frequenting’
- (47) VNSMAD: / $CV_{+high}C□/v, simp pres, 1st$  ↔ / $CV_{-high}C□CV_{+high}C□/n$   
 ‘several reciprocal instances of the action referred to in  
 / $CV_{+high}C□/$ ’<sup>14</sup>  
 /□□□□□□□□/ ‘I run’ ↔ /□□□□□□□□□□□□□□/ ‘several acts of running  
 to and fro’  
 /□□□□□□□□/ ‘I frequent’ ↔ /□□□□□□□□□□□□□□/ ‘act of frequenting’

In M(orphological) D(oubling) T(heory), a morpho-semantic approach by Inkelas (2005), a reduplicated word is comprised of two daughters, i) reduplicant and ii) base, both generated by the morphology from a mother input recoverable morphologically and semantically from the daughters. “The key assumption of MDT is that daughters are semantically identical” whereas “phonological identity is not presupposed or required because each of the daughters may be subject to special phonology” (Inkelas 2005:67). MDT assumes that the same morphological structure is assigned to partial and to total reduplication, which differ solely in whether or not one of the daughters is phonologically truncated.

- (48) NNSVAD : / $X/n$  ↔ / $XX□□□□□□/n$  ‘/X/ and beyond’  
 /□□□□□/ ‘forest’ ↔ /□□□□□□□□□□□□□□/ ‘forest and beyond’  
 /□□□□□/ ‘far’ ↔ /□□□□□□□□□□□□□□/ ‘far and beyond’

The outputs of (32) (repeated here as (48)) are problematic for MDT because in neither of them are the two sisters semantically identical (/□□□□□□□□□□□□□□/ means ‘end of the forest’ and /□□□□□□□□□□□□□□/ means ‘remote or far-off place’). If my observations are right, the two sisters in

(43) [□□□□□] and [□□ÿ□] have not been assigned the same morphological structure and their formal contrast can be explained neither by truncation nor by any phonological rule of Bengali if phonology includes only automatic alternations. The outputs of (44) and (45) can also be problematic for MDT because it does not determine where or how much of the reduplicant has to be truncated or whether the same reduplicant can be truncated in different ways. The base /□□□□□•□□□□□/ can have three different reduplicants: /ÿ•□□□□•□□□□□/ (44) or /ÿ•□□□□□/ or /ÿ□□□□/ (45) depending on whether the reduplicant is truncated and/or how it is truncated.



Travis (2001) argues that reduplication is always triggered in syntax and, like other types of affixation, results from feature checking head movement: the head of the NP (e.g. /<sup>3</sup>/<sub>4</sub>□•□□□/ ‘dispute’ in the reduplicated word /<sup>3</sup>/<sub>4</sub>□•□□□<sup>3</sup>/<sub>4</sub>□□ÿ□/ ‘disputes, etc.’) moves to adjoin to the head representing a quantity feature which is realized as the (reduplicational) affix (/<sup>3</sup>/<sub>4</sub>□□ÿ□/). Reduplication is necessarily realized through this quantity feature checking because, according to her, in many cases reduplication represents a quantity of some sort.

Outputs of (28) (repeated here as (49)) which involve several affixes ([□] and [□]) as well as segmental modification (deletion of /□/) may seem to be problematic for Travis (2001). However, this problem can be overcome if the suffix is represented by the relevant prosodic template (□C<sub>1</sub>□C<sub>2</sub>C<sub>3</sub>□) and the segmental modification is assumed to be part of the process of affixation (i.e. as a ‘morpho-phonological’ change as some approaches usually describe such non-automatic changes).



- (49) NNSMAD: /C<sub>1</sub> • C<sub>2</sub> □ C<sub>3</sub>/<sub>n</sub> ↔ /C<sub>1</sub> • C<sub>2</sub> C<sub>3</sub> □ C<sub>1</sub> □ C<sub>2</sub> C<sub>3</sub> □/<sub>n</sub>  
 ‘continuous and reciprocal instances of /C<sub>1</sub> • C<sub>2</sub> □ C<sub>3</sub>/’  
 /□ • □ □ □/ ‘change’, ‘exchange’ ↔ /□ • □ □ □ □ □ □ □ □/
- ‘several (reciprocal) instances of exchanging’  
 /□ □ • □ □ □/ ‘rebuff’ ↔ /□ □ • □ □ □ □ □ □ □ □/ ‘several  
 (reciprocal) instances of rebuffing’

As is the case with weak lexicalist approaches in general, Travis deals exclusively with inflexional morphology because she is only concerned about the checking of the number feature of NP. But as the outputs of (23), (24) and (26) (repeated here as (50-52)) show, words belonging to syntactic categories other than noun can undergo reduplication. In (50) for example, if the reduplicated adjective needs to check any feature, it will be its quality feature. On the other hand, the adverb in (51) and the derived singular nouns in (52) do not need to check any number feature at all.

- (50) AASMAD: /CX/<sub>adj</sub> ↔ /CX □ X/<sub>adj</sub> ‘CX/ and alike’  
 /□ • □ □/ ‘big’ ↔ /□ • □ □ □ • □ □/ ‘big and alike’  
 /□ □ ÿ □/ ‘fat’ ↔ /□ □ ÿ □ □ □ ÿ □/ ‘fat and alike’

- (51) AAdvSMAD: /CV<sub>-high</sub>X□/adj ↔ /CV<sub>-high</sub>X□CV<sub>+high</sub>X□/adv  
 ‘in /CV<sub>-high</sub>X□/ way’  
 /□ • □□□/ ‘tall’ ↔ /□ • □□□□□□□□/ ‘lengthwise’  
 /□□¾□/ ‘straight’ ↔ /□□¾□□□¾□/ ‘straightly’
- (52) NNSMAD :/XC/<sub>n</sub> ↔ /XC□XC□/<sub>n</sub> ‘reciprocal action involving  
 two or several /XC/ of different persons’  
 /□□□/ ‘ear’ ↔ /□□□□□□□□/ ‘whispering to one another’,  
 ‘spreading rumours’  
 /□□□/ ‘hand’ ↔ /□□□□□□□□/ ‘hand-to-hand fight’

## 6. Conclusion

In this work, I have tried to sketch out a particular type of word-formation in Bengali traditionally known as 'reduplication' and I have shown how it can be satisfactorily handled in the theoretical framework of WWM. Following Singh (2003), I make a distinction between the processes (= strategies) of reduplication and the patterns that exhibit reduplication and claim that the latter fall outside the domain of morphology. Bengali would seem to confirm the WWM claim that there is only one morphology (cf. Ford, Singh and Martohardjono 1997:3) and there is nothing in reduplication which makes it radically different from other bits of morphology, except the fact that strategies activated for forming or retrieving the so-called reduplicated words consist of repeating the (partly specified or totally unspecified) variable.

## Notes

\*This paper is a substantially revised version of a chapter of my recently submitted doctoral thesis. I am grateful to my supervisors for their comments on that chapter and to Stephen Moran for the modifications he proposed. The usual disclaimers apply.

1. To cite some examples, Optimality theory (McCarthy and Prince 1995), Neo optimality theories (Yip 1999; Golston and Thurgood 1999; Struijke 2000), Morphological doubling theory (Inkelas 2003), Lexical prosodic morphology (Kiparsky 2002).

2. WWM was, as noted in Singh (2006), first outlined in Ford and Singh (1991) followed by a fuller, monographic sketch in Ford, Singh and Martohardjono (1997). Various aspects of the model have been elaborated in Singh and Ford (2000), Ford and Singh (2003), Singh and Neuvel (2003) and Singh and Starosta (2003) among others. The model as such has been tested in the light of external evidence in Martohardjono (1986) and Ford, Singh and Marotohardjono (1997)

and against the empirical facts of several languages: Hindi in Singh and Agnihotri (1997), Bengali in Singh and Dasgupta (1999) and Bhattacharja (forthcoming), various South Asian languages including Khasi, Kashmiri and Sanskrit in Singh and Ford (2000), German in Becker (2000), Armenian in Baronian (2002), Latin in Bender (2003) and West Greenlandic in Neuvel (2003).

3. The apparently ambiguous term *word* has a clear-cut definition in WWM: an expression can be considered a *word* if and only if it possesses at least the following three properties among others which remain to be defined: i) a phonological structure, ii) a (syntactic and/or morphological) category, and iii) a semantic use (i.e. a meaning). Ford, Singh and Martohardjono (1997:5) remind us that “whether these properties are sufficient or not to identify the word in any context is a question that we shall leave open. They are necessary, but insofar as we wish to draw a distinction between syntax (formal relationships between linguistic units other than the word) and morphology, they are probably not sufficient.”

4. A WFS is called a *strategy* rather than a *rule* because, i) they are invoked, as Singh and Ford (2000:305) point out “only in moments of crisis i.e. when the speaker needs to analyze or fashion a word she needs for the purpose at hand, often to meet a syntactically enforced requirement” and ii) they are not as automatic as linguistic rules are generally claimed to be, for example, if the speaker-hearer already knows a certain word, (s)he does not need to activate any strategy to retrieve it.

5. The holistic view of morphology goes back to Bhartrihari, an eminent critic of Paninian morphology, who lived in India around 8th century AD. In my view, a true holistic theory would reject the idea that words can be divided into smaller sub-parts. Holistic models of morphology are intrinsically word-based but the contrary is not true which means that not all word-based models of morphology are necessarily holistic. The inputs and the outputs of the word-formation rules proposed by a word-based model are words but the model of morphology remains atomistic (see footnote 6) if it does not categorically reject units smaller than the word (root, stem, affix, etc.). In some word-based approaches, such units are considered as part of word-formation rules and in some others they are listed in the lexicon.

6. The atomistic view of morphology goes back to Panini, who lived in the north-west region of Indian subcontinent (now in Pakistan) around 6th century B.C. (cf. Katre 1989). A good number of the existing models of morphology are largely influenced by or are in the line of the Paninian school as all of them encourage morphology to be a matter of *divide and rule* (cf. Ford, Singh and Martohardjono, 1997) which means that one must divide words into smaller subparts (root, stem, affix, etc.) in order to find out the rules of their concatenation. Quintessentially, the atomistic or Paninian approaches sees morphology, as Singh (2001:344) puts it, “as a combinatorics of units smaller than the word, involving word-internal syntax in some versions, and allows morphological operations on those units.” Therefore, by 'atomistic' or 'Paninian' I point to a certain type of morphological theory which shares a common belief

that i) words have internal hierarchical structure and that ii) words result from the combination of different types of 'word-parts' labeled as *stem*, *radical*, *root*, *affix*, etc.

7. Abbi (1992:12) defines reduplication as “repetition of all or a part of a lexical item carrying a semantic modification”. She classifies reduplication into two different types: i) Morphological and ii) Lexical. Abbi (1992:12) argues that “morphological reduplication refers to the minimally meaningful and segmentally indivisible morphemes which are constituted of iterated syllables” and lexical reduplication “refers to the repetition of any sequence of phonological units comprising a word.” For her (1992:13) “onomatopoeic constructions, imitatives, certain instances of sound symbolisms, mimic words are all examples of morphological reduplication.”

8. Needless to say that the concern here is word-level reduplication. Reduplication of units larger than the word is clearly non-morphological.

9. A tag like AASMAD means that the strategy changes an adjective into another adjective (AA), involves segmental modification (SM) ( $V_{+round, +high}$  is replaced by /□/) and the mechanism of adjunction-deletion (AD). In some tags, in stead of (SM) appears (SV) which means specified variable. (SM) is necessarily (SV) but not vice versa.

10. For example, if a speaker-hearer tries to form the word meaning ‘without fear’ with /□□•□/ ‘fear’, (a) will output either \*/□□□□•□/ or /□□□□□•□/. The pairs in (b) show that the formal difference alone does not suffice either to justify a process.

- (a) 1. /□•□•N□□/ₙ ‘bad reputation’ → /□□□□•□•N□□/ₐdj ‘without any bad reputation’  
 2. /□•□•N□□□/ₙ ‘pride’ → /□□□•□N□□□/ₐdj ‘without pride’, ‘humble’
- (b) 1. /□□/ₙ ‘mother’ → /□□□□□□/ₙ ‘metaphor’  
 2. /□□□□/ₙ ‘necklace’ → /□□□□□□□□/ₙ ‘gift’

11. Certain homophonous sequences like /□•□□•□/ is interesting in the sense that they can be described either as example of process or of pattern. One of the versions of /□•□□•□/ ‘bridegroom like’ can be mapped onto (33) (repeated here as (c)) and be thereby analyzed into /□•□/ ‘bridegroom’. If only this version is considered, /□•□□•□/ is a complex word that has undergone the process of reduplication. But the other version of the word /□•□□•□/ ‘barbarian’ cannot be analyzed back into any word and if this version is considered, /□•□□•□/ would be a simple word showing only the pattern of reduplication.

- (c) NAAD: /X/ₙ ↔ /XX/ₐdj ‘like /X/’  
 /□•□/ ‘bridegroom’ ↔ /□•□□•□/ ‘bridegroom-like’  
 /□□□□/ ‘girl’ ↔ /□□□□□□□□/ ‘girl-like’

12. Each strategy involves some ‘change in the category of the word’ which I label as *morphological operations* (such as *adverbialization*, *pluralization*, *gender change*, etc.), These operations are realized through formal means which I call *morphological mechanisms* or simply *mechanisms*. The different mechanisms are exemplified below:

| Identity                                  | Adjunction-deletion                             | Substitution                                |
|---|---|---|
| /X/ <sub>n, sing</sub> ↔ /X/ <sub>v</sub> | /X/ <sub>n, sing</sub> ↔ /X□/ <sub>n, plu</sub> | /X«□□/ <sub>adj</sub> ↔ /X«□□/ <sub>n</sub> |
| rhyme ↔ rhyme                             | dog ↔ dogs                                      | absent ↔ absence                            |
| fight ↔ fight                             | rose ↔ roses                                    | important ↔ importance                      |

| Segmental modification<br>+ adjunction     | Suprasegmental<br>Modification               |
|--|--|
| /X□/ <sub>adj</sub> ↔ /X□□□□/ <sub>n</sub> | /σσ/ <sub>n, sing</sub> ↔ /σ'σ/ <sub>v</sub> |
| electric ↔ electricity                     | import ↔ im'port                             |
| opak ↔ opasiti                             | protest ↔ pro'test                           |

13. In approaches other than WWM, the outputs of strategies like (19) are described as completely reduplicated words and those of (20-22) as partially reduplicated ones. Unlike completely reduplicated words which generally have a distributive interpretation, partially reduplicated words are usually endowed with either an ‘Et Cetera’ and/or an ‘X and alike’ interpretation (cf. Singh 2003) in Bengali.

14. If a strategy i) involves the mechanism of substitution and ii) all of its outputs can be obtained from some other strategy, I consider it as a secondary strategy. No such strategy is included in the list of 28 strategies in section 4. For example, (47) (repeated here as (d)) is not a primary strategy because all of its outputs can be obtained from (46) (repeated here as (e)). On the other hand, (28) and (38) (repeated here as (f-g)) are both primary strategies because one of the outputs of (g) /□□□□□□□□□□□□□□/ cannot be obtained from (f) for \*/□□□□□ • □/ is not a word of Bengali. However, this should be kept in mind that WWM grants no theoretical status to the difference between primary and secondary strategies. As long as there is a lexicon, the morphological module automatically makes various obvious links among them and therefore, all strategies are part of the morphological module. But, as I do not have sufficient space, I have only listed the primary strategies and have left aside the secondary ones.

- (d) VNSMAD: /CV<sub>+high</sub>C□/<sub>v, simp pres, 1st</sub> ↔ /CV<sub>-high</sub>C□CV<sub>+high</sub>C□/<sub>n</sub> ‘several reciprocal instances of the action referred to in /CV<sub>+high</sub>C□/’  
 /□□□□y□/ ‘I run’ ↔ /□□□□y□□□□y□/ ‘several acts of running to and fro’  
 /□□□□/<sub>v</sub> ‘I frequent’ ↔ /□□□□□□□□□□/<sub>n</sub> ‘act of frequenting’

- (e) VNSMAD: /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>/v, pres imp, 2nd intim/derog ↔ /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>□C<sub>1</sub>V<sub>+high</sub>C<sub>2</sub>□/n  
 ‘continuous instances of the action asked for in /C<sub>1</sub>V<sub>-high</sub>C<sub>2</sub>/’  
 /□□□y/ ‘run!’ ↔ /□□□y□□□y□/ ‘running here and there’  
 /□□□/ v ‘frequent!’ ↔ /□□□□□□□□/ n ‘act of frequenting’
- (f) NNSMAD: /C<sub>1</sub>•C<sub>2</sub>□C<sub>3</sub>/n ↔ /C<sub>1</sub>•C<sub>2</sub>C<sub>3</sub>□C<sub>1</sub>□C<sub>2</sub>C<sub>3</sub>□/n ‘continuous and reciprocal instances of /C<sub>1</sub>•C<sub>2</sub>□C<sub>3</sub>/’  
 /□•□□□/ ‘change’, ‘exchange’ ↔ /□•□□□□□□□□/ ‘several (reciprocal) instances of exchanging’  
 /□□•□□□/ ‘rebuff’ ↔ /□□•□□□□□□□□□□/ ‘several (reciprocal) instances of rebuffing’
- (g) VNSMAD: /CV<sub>-high</sub>X□/v, pres imp, 2nd intim/derog ↔ /CV<sub>-high</sub>X□CV<sub>+high</sub>X□/n  
 ‘several (reciprocal) instances of the action asked for in /CV<sub>-high</sub>X□/’  
 /□•□□□/ ‘change!’, ‘exchange!’ ↔ /□•□□□□□□□□□□/ ‘exchanging something between each other’  
 /□□□□□□□□/ ‘drag or trail along forcefully!’ ↔ /□□□□□□□□□□□□□□□□/ ‘act of dragging or trailing along each other forcefully’

### Abbreviations:

|                      |                  |
|----------------------|------------------|
| 1st: First person    | MW: Measure Word |
| 2nd: Second person   | n/N: Noun        |
| A/adj: Adjective     | p: Postposition  |
| Adv/adv: Adverb      | perf: Perfective |
| compl: Complement    | plu: Plural      |
| derog: Derogative    | pres: Present    |
| imp: Imperative      | sing: Singular   |
| interj: Interjection | simp: Simple     |
| intim: Intimate,     | V/v: Verb.       |
| loc: Locative        |                  |

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