How to Speak Backwards in Tagalog

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Considerable attention has recently been focussed on the form and function of *ludlings*, also known as *speech disguises*, *language games*, and *secret languages*; see, for example, Conklin (1959), Berkovits (1970), Laycock (1972), Sherzer (1976), McCarthy (1985), Hombert (1986), Bagemihl (1988,1989) and references therein. One common strategy for the formation of ludlings consists of *speaking backwards*. Most commonly, it is the order of the syllables that is reversed; such, for example, is the case for ludlings in Chaga, Chasu, French, Sanga, Saramaccan, Swahili, and other languages (Bagemihl 1989:484-485). However, in a smaller number of instances, it is the order of segments that is reversed; such ludlings occur in, among others, Czech, English, Finnish, French, Javanese, New Guinea Pidgin, and Saramaccan (Bagemihl 1989:484-485).

One particularly rich source of ludlings is provided by Tagalog. Conklin (1956) lists eight distinct varieties of ludlings in Tagalog, while further examples and discussion of Tagalog ludlings may be found in Garcia (1934), de Manila (1980:10-15), and French (1988:97-111). This paper is concerned with one particular ludling in Tagalog, formed by reversing the order of segments; this ludling may accordingly be referred to as *Golagat*. The data cited in this paper were collected from the speech of children in Iba, Zambales Province, and Pagsanjan, Laguna Province, in the Philippines. The ludling under consideration here was in fact the only one that I encountered in spontaneous use, leading to the conjecture that it is at least the most prevalent ludling among speakers of Tagalog.

Prima facie, speaking backwards would seem to be a conceptually straightforward task: simply reverse the order of segments in a word. However, the process of segment-reversal in Golagat interacts in manifold ways with the rich morphological system of Tagalog. In this paper, we shall examine some aspects of this interaction, and show how it may yield valuable insights into the grammar of Tagalog and the structure of phonological theory.

In monomorphemic words, the reversal of segments is indeed straightforward:[1]

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[1]Most of the examples cited in this paper are presented in the standard Tagalog orthography, which is largely phonetic. Two points should, however, be noted: (a) the glottal stop is not represented in the orthography; (b) the velar nasal stop is represented with a digraph, *ng*. The Tagalog forms are provided with free English glosses, and with morpheme-by-morpheme glosses making use of the following abbreviations: AT "actor-topic focus"; ASP "aspect marker"; DIR "direct (case)"; DIST "distributive"; INST "instrumental"; IPFV "imperfective"; LIG "ligature"; OBL "oblique"; PERS "personal (article)"; PT "patient-topic focus"; REAL "realis"; SG "singular"; STAT "stative"; TOP "topic"; 2 "2nd person".

(1) a. Atoy   > Yota
         (name)
     b. bayawak   > kawayab
         iguana
         'iguana'
     c. puti   > itup
         white
         'white'
     d. kain   > niak
         eat
         'eat'

In a sentence, each word is reversed separately:

(2) Upo   ka   na   muna   dito   >   Opu ak an anum otid
     sit   TOP:2:SG ASP   while here
     'Sit here for a while'

In the above example, *ka*, *na* and *muna* are clitics, occurring in Wackernagel's sentence-second position; as evidenced by the above example, such clitics are treated as independent words, undergoing reversal like all other words.
     However, in polymorphemic words, it is generally the case that only the stem undergoes reversal; the affixes remain in their original order:

(3) a. tiglima   > tigamil   (stem: *lima*; prefix: *tig-*)
         DIST-five
         'five each'
     b. malaki   > maikal   (stem: *laki*; prefix: *ma-*)
         STAT-big
         'big'
     c. pumasok   > kumosap   (stem: *pasok*; infix: *-um-*)
         AT:REAL-enter
         'entered'
     d. sulatin   > talusin   (stem: *sulat*; suffix: *-in*)
         write-PT
         'be written'

Thus, in (3a) the distributive prefix *tig-* remains unchanged while the stem *lima* 'five' is reversed; in (3b) the stative prefix *ma-* retains its original form while the stem *laki* undergoes reversal; in (3c) the actor-topic infix *-um-* is unchanged while the stem *pasok* 'enter' is reversed; and in (3d) the patient-topic suffix *-in* preserves its original order while the stem *sulat* 'write' undergoes reversal.
     In addition, the case markers *ang*, *ng* (phonetically [nang]), *sa*, and their personal variants *si*, *ni* and *kay* are also opaque to reversal. For example, in the following sentence, *ni*, *ang* and *sa* remain unchanged, as does the infix *-in-* in *Tinapon*:

(4) Tinapon   ni   Bading ang bato sa   tubig
     PT:REAL-throw   PERS.DIR   Bading TOP stone OBL water
     'Bading threw the stone into the water'

     > Ninopat ni Ngidab ang otab sa gibut

This suggests that Tagalog case markers, contra their orthographic representation as independent words, are more appropriately analyzed as prefixes.[2]

Of particular interest is the interface of reversal with the productive process of reduplication. In Tagalog, reduplication applies to the initial CV or CVCV sequences of the stem.[3]   However, in Golagat, reduplication, while still occurring initially, involves the segments at the end of the original stem, which are moved to the beginning by the process of reversal:

(5) a. babalik   > kikilab   (stem: *balik*; reduplication of initial CV)
         AT-IPFV-return
         'will return'
     b. sasama   > aamas   (stem: *sama*; reduplication of initial CV)
         AT-IPFV-come
         'will come'
     c. aakyat   > tatayka   (stem: *akyat*; reduplication of initial CV)
         AT-IPFV-climb
         'will climb'
     d. daladalawa   > awaawalad   (stem: *dalawa*; reduplication of initial CVCV)
         DIST-two
         'two by two'

Thus, in (5a), stem *balik* 'return' becomes *kilab* and reduplication applies to *ki-*; in (5b), stem *sama* 'come' becomes *amas* and reduplication applies to *a-*; in (5c), stem *akyat* 'climb' becomes *tayka* and reduplication applies to *ta-*; and in (5d), stem *dalawa* 'two' becomes *awalad* and reduplication applies to *awa-*.

The following paradigm illustrates the interaction of reduplication with affixation in Golagat:

(6) a. kain   > niak   (=(1d))   (stem: *kain*)
         eat
         'eat'
     b. kumain   > numiak   (stem: *kain*; infix: -*um*-)
         AT:REAL-eat
         'ate'
     c. kakain   > niniak   (stem: *kain*; reduplication of initial CV)
         AT-IPFV-eat
         'will eat'
     d. kumakain   > numiniak   (stem: *kain*; reduplication of initial CV;
         AT:REAL-IPFV-eat   infix: -*um*-)
         'eats'

Example (6a), identical to (1d), portrays the total reversal of a monomorphemic stem. Example (6b), similar to (3c), illustrates the opacity of the infix -*um*- with respect to reversal. Example (6c), similar to (5a), instantiates reduplication. Of interest here is example (6d), involving both infixation and reduplication: while in the original form, the infix -*um*- occurs between the two elements of the initial reduplicated *ka*-, in the

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[2]Alternatively, one might propose that reversal applies only to "content words", not to "function words", as is in fact the case in a variety of other ludlings (Bagemihl 1988:484-485). However, such a proposal is belied by the fact that in other cases, reversal clearly applies to function words, such as the clitics in (2) above, and the ligature in (10,11a) below.

[3]In the case of orthographically vowel-initial stems, reduplication appears to apply only to the vowel. In fact, however, it applies to the vowel plus a preceding glottal stop not represented in the orthography.

ludling form, the infix -um- occurs between consonant and vowel of the initial reduplicated ni-.[4]
The data in (3) - (6) appear to point towards the following analysis for reversal in Golagat:

(7) *The Reversal-Precedes-Morphology Analysis:*
     Reversal precedes all morphological processes.

The Reversal-Precedes-Morphology analysis allows for derivations such as the following:

(8)	*example:*	(6a)	(6b)	(6c)	(6d)
	stem:	kain	kain	kain	kain
	reversal:	niak	niak	niak	niak
	morphological processes:	—	numiak	niniak	numiniak

In accordance with the Reversal-Precedes-Morphology analysis, reversal applies to lexically-specified stems, prior to the application of morphological processes. The Reversal-Precedes-Morphology analysis thus provides an intuitively appealing account of the data in (1) - (6).
If the Reversal-Precedes-Morphology analysis is valid, then from a cross-linguistic point of view, Golagat would be a ludling of exceptional nature. Mohanan (1982:88) claims that all ludlings follow morphological and lexical phonological rules, applying not to morphemes but to words; under the Reversal-Precedes-Morphology analysis, Golagat presents a clear counterexample to Mohanan's claim. More recently, however, Bagemihl (1988) has proposed that ludlings may apply at any of three distinct levels, or "modules", and indeed, he assigns Golagat to "module 1", which applies to the lexicon prior to morphological processes (p.496). Interestingly, though, Bagemihl's extensive cross-linguistic survey suggests that ludlings applying before morphological processes are relatively uncommon.
Further evidence, however, shows that the Reversal-Precedes-Morphology analysis for Golagat, proposed in (7), must be abandoned. Consider the following forms:

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[4]A paradigm similar to (6), with inflections of *kain* 'eat', but involving syllable rather than segment reversal is discussed in Bagemihl (1988:419-420) — who comments that "[i]t is not clear whether this is a fossilized form". My own observations regarding the interaction of (segment) reversal and reduplication suggest that the processes involved — exemplified in (5) and (6) above — are totally productive, occurring spontaneously and frequently in Golagat speech. That several sources cite examples involving *kain* is probably a coincidence similar to the profusion of Johns and Bills in syntacticians' sample sentences in English.

(9)	a.	manigarilyo AT-cigarette 'smoke (cigarettes)'	>	oyliraginam	(stem: *sigarilyo*; prefix: *maN-*)
	b.	mangisda AT-fish '(catch) fish'	>	adsingam	(stem: *isda*; prefix: *maN-*)
	c.	pamasahe INST-travel 'travel fare'	>	ehasamap	(stem: *pasahe*; prefix: *paN-*)
	d.	pangalan INST-name 'name'	>	nalangap	(stem: *ngalan*; prefix: *paN-*)

Each of the above forms consists of a stem plus a prefix; yet unlike the ostensibly similar forms in (3a,b), the entire word — stem together with prefix — undergoes reversal.

What distinguishes the forms in (9) from those in (3) - (6) is a morphophonemic property: in (9), the boundary between stem and prefix is rendered opaque by a rule of assimilation/deletion. In (9a,b), stems *sigarilyo* 'cigarette' and *isda* 'fish' are preceded by the actor-topic prefix *maN-*, which triggers replacement of the first consonant of the stem with a homorganic nasal: *maN-sigarilyo* → *manigarilyo*, *maN-isda* (with stem-initial glottal stop) → *mangisda*. Similarly, in (9c,d), stems *pasahe* 'travel' and *ngalan* 'name' are preceded by the instrumental prefix *paN-*, which, again, triggers replacement of the first consonant of the stem with a homorganic nasal: *paN-pasahe* → *pamasahe*, *paN-ngalan* → *pangalan*.

A second, related class of counterexamples to the Reversal-Precedes-Morphology analysis in (7) is provided by constructions involving the ligature:

(10)	a.	apat	na	bata	>	tapa an atab
		four	LIG	child		
		'four children'				
	b.	tatlong		bata	>	ngoltat atab
		three-LIG		child		
		'three children'				

(11)	a.	mahal	na	regalo	>	laham an olager
		expensive	LIG	gift		
		'expensive gift'				
	b.	murang		regalo	>	ngarum olager
		cheap		gift		
		'cheap gift'				

In Tagalog, modifier-head constructions are of the form X *ligature* Y, where the ligature is of variable form: if X ends in a consonant, as in (10,11a), the ligature takes the form of an independent word *na*, whereas if X ends in a vowel, as in (10,11b) *tatlo* and *mura*, it assumes the form of a suffix *-ng* attached to X. As evidenced above, while the independent form *na* undergoes reversal as a separate word, its bound variant *-ng* undergoes reversal in conjunction with the stem to which it attaches, yielding the forms *ngoltat* in (10b) and *ngarum* in (11b).

Thus, like the prefixes *maN-* and *paN-*, the suffix *-ng* undergoes reversal together with the stem to which it attaches. Moreover, like *maN-* and *paN-*, the form of the suffix *-ng* is determined by a morphophonemic rule. These facts suggest the following generalization:

(12)   *The Morphophonemic-Rule Generalization:*
Affixes whose form is determined by morphophonemic rules undergo reversal together with the stems to which they attach.

Affixes of variant form must accordingly apply *before* reversal. (For example, if prefixation of *maN-* in (9a) applied after reversal, the resulting form would be **mangoyliragis*; similarly, if the ligature in (10a) applied after reversal, the resulting form would be **tapang atab*.)

However, the Morphophonemic-Rule generalization in (12) runs counter to the Reversal-Precedes-Morphology analysis in (7). If both are to be upheld, this would entail a classification of Tagalog morphological processes into two types: "Type A" processes, not involving morphophonemic rules, and "Type B" processes, involving morphophonemic rules. Such a classification would be needed in order to stipulate that — in accordance with the Golagat evidence — "Type A" processes precede "Type B" processes in the grammar of Tagalog. However, this classification and concomitant rule ordering appears highly ad hoc and unmotivated. "Type B" processes form a heterogeneous collection: other than their involvement of morphophonemic rules, no substantive properties seem to be shared by "Type B" processes to the exclusion of their "Type A" counterparts. In fact, particular "Type B" processes may have more in common with particular "Type A" processes than with other "Type B" processes. Thus, for example, the "Type B" prefix *maN-* forms a natural morphosyntactic class with other "Type A" actor-topic affixes such as *ma-*, *mag-* and *-um-* (as in (3c) and (6b)), these different actor-topic affixes occurring in complementary distribution. To single out *maN-* and stipulate that it apply after all other actor-topic affixes solely on the basis of its involving a morphophonemic rule and undergoing reversal in Golagat accordingly seems unwarranted.

The Morphophonemic-Rule generalization in (12) thus suggests that the Reversal-Precedes-Morphology analysis in (7) be abandoned. How, then, may the Golagat facts be accounted for? The following analysis provides a unified account of the data in (1) - (6) and (9) - (11):

(13)   *The Morphology-Precedes-Reversal Analysis:*
    a.   Reversal follows all morphological processes;
    b.   Reversal applies to lexical stems;
    c.   Morphophonemic rules erase the boundaries between stems and affixes.

For data such as in (1) - (4) and (6a,b), the first two clauses alone of the Morphology-Precedes-Reversal analysis apply, yielding derivations such as the following:

(14)   *example:*

	(6a)	(6b)	(3a)	(3d)
stem:	kain	kain	lima	sulat
morphological processes:	—	k(um)ain	(tig)lima	sulat(in)
reversal:	niak	n(um)iak	(tig)amil	talus(in)

In the first stage of the derivations, morphological processes of affixation apply to lexical stems; in (14) above, these affixes are enclosed in brackets. Subsequent to affixation, reversal applies — but only to the lexical stems, skipping over the bracketed affixes.

For data such as in (1) - (4) and (6a,b), the Morphology-Precedes-Reversal analysis in (13) is empirically indistinguishable from the Reversal-Precedes-Morphology analysis in (7); in fact, it is somewhat less elegant, involving a more complex rule of reversal that must apply only to stems, while ignoring affixes. However, the Morphology-Precedes-Reversal analysis alone of the two is capable of

accounting for data such as in (9) - (11), involving affixes whose form is governed by morphophonemic rules, consequently undergoing reversal in accordance with the Morphophonemic-Rule generalization in (12). For such data, all three clauses of the Morphology-Precedes-Reversal analysis in (12) apply, yielding derivations such as the following:

(15) *example:*   (9a)   (9c)   (10b)
     stem: sigarilyo   pasahe   tatlo
     morphological processes: manigarilyo   pamasahe   tatlong
     reversal: oyliraginam   ehasamap   ngoltat

In (9) - (11), affixation of *maN-*, *paN-* and the ligature involves morphophonemic rules; accordingly, following (13c), the boundaries between these affixes and the stems to which they attach are erased, and hence reversal applies to the stem-plus-affix complex — in the above examples, to the word as a whole. Thus, data such as in (9) - (11) provide conclusive support for the Morphology-Precedes-Reversal analysis in (13).

     Remaining to be accounted for are the data in (5) and (6c,d), involving reduplication. While it is easy to see how a rule of reversal may skip over an affix to apply only to the stem, it is less obvious how such a post-morphological rule of reversal might take an already reduplicated form such as (5a) *babalik* in order to derive the correct *kikilab*, and not, say, **bakilab* (in analogy with (3a) *tiglima > tigamil*), or **kilabab* (in analogy with (9a) *manigarilyo > oyliraginam*). Here, indeed, it would appear as though in order to derive the correct Golagat form *kikilab*, reduplication must apply after reversal. However, such an analysis would run counter to the Morphology-Precedes-Reversal analysis; moreover, it would also engender an ordering paradox. If reduplication follows reversal (as per the above), and reversal follows affixation (as per derivations such as in (14) and (15)), then by transitivity, reduplication must follow affixation. However, the opposite is in fact the case, as is evidenced by Tagalog forms such as (6d) *kumakain*, in which infixation of *-um-* must follow reduplication of stem-initial *ka-*. How, then, might we extricate ourselves from this paradox?

     The answer lies in the observation that while reversal follows the application of morphological processes, it *precedes* the application of automatic phonological and phonetic rules. Consider the following examples:

(16) a.   ulo   [ulo]   > olu   [ulo]
         head
         'head'
     b.   ate   [ate]   > eta   [ita]
         elder:sister
         'elder sister'
     c.   makita   [maqita]   > maatik   [maatik]
         PT:see
         'be seen'
     d.   sa   balik   [sabalik]   > sa kilab   [saqilab]
         OBL return
         'to the return'

Examples (16a,b) illustrate the effects of the (optional) alternation between high vowels [u] and [i] in pre-final syllable position, and corresponding mid-vowels [o] and [e] in final syllable position. When [ulo] is reversed, final mid [o] becomes pre-final high [u], and pre-final high [u] becomes final mid [o] — thus, the Golagat form is identical to its Tagalog source. Similarly, when [ate] is reversed, final mid [e] becomes pre-final high [i]. Examples (16c,d) involve the (optional) backing and/or

lenition of [k] in the environment of a back vowel.[5] In *makita*, [k] becomes [q] because of the preceding [a]; however, when the form is reversed, the [k] is no longer adjacent to the [a], and hence does not change to [q]. Conversely, in *sa balik*, the [k] has no reason to change to [q]; however, when the form is reversed, the [k] moves into post-[a] position and therefore changes to [q]. Thus, as evidenced by the above, reversal precedes the application of automatic phonological rules. As such, it is consistent with Bagemihl's (1988:443) cross-linguistic findings that "[t]he vast majority of ludlings apply before the operation of postlexical rules".

We may accordingly account for the data in (5) and (6c,d) by decomposing the process of reduplication into two components: (a) reduplication of C and V slots, a morphological process, which, like affixation, precedes reversal, in accordance with the Morphology-Precedes-Reversal analysis; and (b) spreading of melodic elements onto C and V slots, a phonological process, which, like the phonological processes exemplified in (16) above, follows reversal. Resulting are derivations such as the following:

(17) *example:*   (5a)   (5d)   (6d)
      stem: balik   dalawa   kain
      morphological processes: (CV)balik   (CVCV)dalawa   (CumV)kain
      reversal: (CV)kilab   (CVCV)awalad   (CumV)niak
      spreading: (ki)kilab   (awa)awalad   (numi)niak

In (17), like in (14), the outputs of morphological processes are enclosed in brackets; as in (14), reversal skips over the bracketed material, applying only to the lexical stems. Thus, by viewing reduplication in Tagalog as a morphological process applying to skeletal slots followed by the spreading of melodic elements, it is possible to account for the data in (5) and (6c,d) straightforwardly, within the framework of the Morphology-Precedes-Reversal analysis.

The Morphology-Precedes-Reversal analysis in (13) thus accounts for the entirety of the Golagat data under consideration. Moreover, it does so in a way that is maximally consistent with phonological theory and the properties of ludlings. Clause (13a), ordering reversal after morphological processes, concords with Mohanan's (1982) claim that ludlings always follow morphological operations. More specifically, it locates Golagat in Bagemihl's (1988) "module 2", that which contains a large majority of the world's ludlings — contra Bagemihl's own attribution of Golagat to "module 1". Clause (13b), asserting that reversal applies to lexical stems, counterindicates Mohanan's (1982:88) claim that ludlings "operate on words, not on morphemes", and "are blind to the internal structure of words". Instead, it is consistent with Bagemihl's (1988:423) characterization of a variety of ludlings, whereby "a fully inflected form is submitted to the ludling component, but then the ludling operation simply picks out only stem segments". Clause (13c), specifying that morphophonemic rules erase the boundaries between stems and affixes, follows naturally from such an analysis. While in forms such as (3a) *tiglima*, stem *lima* is easily picked out, in forms such as (9a) *manigarilyo*, stem *sigarilyo* is not readily identifiable; hence, it is unsurprising that reversal applies to the word as a whole. As

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[5]This rule, subject to a great deal of variation, transforms the velar stop into a uvular stop or fricative, which may sometimes also be glottalized. The rule applies after the vowels [a], [o], and [u], and to a lesser extent also before them; the rule is most salient in the environment of [a]. The examples cited above all involve the backing/lenition of [k] following [a] — the environment in which the effects of the rule are most pronounced. For orthographic convenience, the back/lenis variant of [k] is represented as *[q]*.

Sapir (1921:132) puts it: "Where there is uncertainty about the juncture ... the unity of the complete word is more strongly emphasized. The mind must rest on something. If it cannot linger on the constituent elements, it hastens all the more eagerly to the acceptance of the word as a whole."

The above analysis thus underscores the structural affinity of Golagat with a variety of ludlings in diverse languages, demonstrating how ludlings may yield insights into grammatical theory and the grammars of particular languages. Speaking backwards in Tagalog shows how the playful creativity of Pilipino children, constrained by the exigencies of phonological theory, interacts with the grammar of Tagalog to give rise to a ludling of exceptional beauty.

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