

Nyikina Paradigms and Refunctionalization:  
A Cautionary Tale in Morphological Reconstruction

Claire Bower  
*Yale University*

Department of Linguistics  
PO Box 208366  
New Haven, CT 06520, USA

`claire.bowern@yale.edu`

Ph: +1.203.432.2045

**Keywords:** morphology, Nyulnyulan, Australian languages, exaptation, reconstruction, analogy

### **Abstract**

Here I present a case study of change in the complex verb morphology of the Nyikina language of Northwestern Australia. I describe changes which lead to reanalysis of underlying forms while preserving much of the inherited phonological material. The changes presented here do not fit into previous typologies of morphological change. Nyikina lost the distinction between past and present, and in doing so, merged two paradigms into one. The former past tense marker came to be associated with intransitive verb stems. The inflected verbs thus continue inherited material, but in a different function. These changes are most parsimoniously described in a theory of word formation which makes reference to paradigms.

## **1 Introduction**

### **1.1 Background**

Many types of change can occur in morphology. Studies such as Anderson (1988) and Koch (1996) identified a series of processes which cause change in morphemes. These include, in addition to regular sound change which operates on fully inflected forms, various types of boundary shift (such as the absorption of material into stems or the reanalysis of one morpheme as two), and analogical changes such as paradigm regularization. Inflectional material can also be lost.

Other processes are particularly associated with morphological change in complex paradigms, though by no means exclusively so. These include so-called “hermit-crab” morphology – and the related change of “lost wax” – described by Heath (1997, 1998). Such changes operate within an inflectional paradigm and involve the phonological reformation of material on the basis of formally and functionally similar material. Chafe (1998) provides a few further types of change which are particularly associated with morphological complexity (including an identification of Hermit Crab morphology process independently of Heath 1997). Chafe details a number of processes which might be considered broadly “analogical,” and which apply in particular in complex stems. These include the extension of analogies on the basis of stem shapes and “florescence” (Chafe 1999:109); that is, the elaboration of paradigms and creating of new affixal components (that is, the creation of new cells within a paradigm). Further changes which Chafe particularly associates with complex inflect forms include sporadic grammaticalization and idiomatic shifts in individual paradigm cells, leading to paradigmatic gaps.

A third type of change is known as exaptation (Lass 1990) or refunctionalization (Smith 2008). Refunctionalization is the process whereby one morphologically marked opposition is recruited to mark a different type of opposition. For example, Smith (2008) describes the case of Young People’s Tiwi (Lee 1987), where a distinction between first person inclusive and exclusive has been remapped as a past/non-past tense distinction. Another example is the case of the Pitta-Pitta allomorphs of the locative case, where an earlier phonologically-conditioned allomorphy underwent a semantic split and was refunctionalized as two cases, a locative and a causal/malefactive (Bowern 1998). Lass (1990) provides examples from Germanic and Smith (2006) from Romance.

Here, I present a case study of a set of changes which have occurred in the inflectional morphology of the Nyikina language of northwestern Australia. The changes described for Nyikina here do not fit under the rubric of previously described types of morphological change. While they are analogical, they are triggered by a change elsewhere in the morphology. I present a reconstruction of proto-Nyulnyulan verb morphology and outline the changes evident in the Eastern branch of the Nyulnyulan family (to which Nyikina belongs) and their implications for reconstruction of inflectional morphology more generally.

Three results emerge from this case study. The first is the identification of a type of coercive

change which has not previously received attention in the literature. We see in Nyikina a change where a morpheme is reanalyzed because of a change elsewhere in the inflected word. This in turn provides evidence for the status of paradigms in morphological change; the changes presented here provide evidence for paradigms as a morphological construct (pace Bobaljik 2001). Such changes are most parsimoniously described in a theory of word formation which makes reference to paradigms.

The third issue involves the status of morphology in reconstruction. Despite early suggestions (Hymes 1956, Sapir 1921) that morphology is especially stable and indicative of deep genetic relationships, we have long known that using morphology alone can produce unreliable reconstructions, both because of the difficulty in establishing sound correspondences in word pieces and because of the possibility of analogical change (see further Thomason 1980, Thomason and Kaufman 1988, and earlier Darnell and Sherzer 1971). The data here present a further reason for caution: as a result of the changes outlined here, morphemes with similar or identical function across the family are no longer cognate; instead, they have cognates in string-adjacent but functionally very different morphemes. This raises doubt about the status of families which are reconstructed and hypothesized solely on the basis of resemblances in verb morphology.

I begin with a short overview of the Nyikina language and the relevant verbal morphological categories. I then go on to present a reconstruction of earlier stages of the language. Because the Nyulnyulan languages are quite closely related (although not mutually intelligible) this is straightforward. I then discuss the implications for the reconstruction.

## 1.2 Nyikina and the Nyulnyulan family

There are about ten languages in the Nyulnyulan family (Bower 2004, McGregor and Stokes 2004). Although they are closely related, there are not mutually intelligible. The area covered by the family extends the entire length of the Dampier Peninsula and inland up the Fitzroy River towards Fitzroy Crossing, in Western Australia's Kimberley Region. The family is divided into two branches (termed 'Eastern' and 'Western' by speakers and followed in the linguistic literature), with the Eastern languages differing in systematic ways from the Western languages, particularly in lexicon and morphology.

Nyikina is an Eastern Nyulnyulan language; it is the easternmost member of the family. All Nyikina data are from Stokes (1982) and Nyulnyulan reconstructions build on work in Bower (2004). The other Eastern Nyulnyulan languages, Yawuru (Hosokawa 1991) and Warrwa (McGregor 1994), also show some of these changes, although the details of the subsequent history are distinct.<sup>1</sup>

---

<sup>1</sup>Examples are given here in a slightly modified community orthography. I use *k* for the velar stop, *ŋ* for the velar nasal and <u> for /u/, which in these languages is normally written <oo>. Further conventions are as follows: <ny> = /ɲ/; <y> = /j/, <rr> = /r/, <r> = /ɹ/, <j> is IPA /ç/. Abbreviations are CONT, continuous (aspect); EP.NASAL,

### 1.3 Proto-Nyulnyulan verbs

Proto-Nyulnyulan verb morphology can be reconstructed as mostly agglutinative, with prefixes for tense/mood and subject marking, and suffixes for further tense/aspect distinctions; reflexive/reciprocal marking was circumfixal, and direct object and oblique agreement was by clitics. Although mostly agglutinative, there are some areas of irregularity (to be discussed below).

Consider the inflected verb in (1) below. This form could be used as a translation for the English sentence “I was laughing” in Bardi, Nyulnyul, and Nyikina, and in Warrwa in the meaning “I am laughing”.<sup>2</sup> The morphological segmentation is identical, however the morphemes have different meanings. The overall gloss of the word is also different in each language.

(1) *ŋaŋkaman*

	ŋa-	ŋ-	kama	-n
Bardi	1sg-	PAST-	laugh	-CONT
Nyulnyul	1sg-	PAST	laugh	-PAST
Nyikina	1sg-	INTR.REALIS	laugh	-CONT
Warrwa	1sg-	EP.NASAL	laugh	-PRES

In Bardi, the form is a first person singular intransitive verb with continuous aspect marking. It is, however, a rare form in the paradigm; a more usual translation of “I was laughing” would be *ŋaŋkamagal*, with the recent past suffix. In Nyulnyul, the form is the regular past tense; in neither of these languages is transitivity marked overtly. In Nyikina, the form is the intransitive, realis, non-future, and would mean “I was laughing” or “I am laughing.” In Warrwa, the form is present, as denoted by the suffix *-n*. The Warrwa prefix *ŋ-* is an empty morph with no readily identifiable meaning.

Most of this verb morphology can be reconstructed to Proto-Nyulnyulan. The reconstruction method used here follows Koch (1996, 1997) and standard procedures for comparative/historical linguistics (Fox 1995, Hock and Joseph 1996). It involves reconstructing both whole words (cf. *ŋaŋkaman* in (1) above, which is both a reconstruction to Proto-Nyulnyulan and the surviving form in many Nyulnyulan languages) and extrapolating from the reconstructions and extant languages to arrive at a morphological analysis.

Four tense/mood prefixes can be reconstructed to proto-Nyulnyulan: a past marker *\*ŋ(a)-*, present *\*ø-*, future *\*ŋg-* (with further allomorphs dependent on the subject person), and irrealis *\*l(a)-*. In the Eastern Nyulnyulan languages, we also have evidence for a future irrealis (remote

---

epenthetic nasal; FUT, future; INTR, intransitive; IRR, irrealis; PAST, past tense; PERS person; PRES, present tense; TNS, tense; TR, transitivity;

<sup>2</sup>Not all Nyulnyulan verbs are this readily identifiable. The Yawuru verb form in (1) would be *ŋa-ŋ-kami-n* if it existed; however, in that language, the root has lost its ability to take intransitive prefixes, and always appears with the transitive prefix.

future) morpheme with the form *rra-* for singular subjects and *ya-* for plural subjects. There is no trace of these prefixes in the Western languages; it is possible that they were present in Proto-Nyulnyulan but in the absence of further evidence I reconstruct them definitely only to Proto-Eastern Nyulnyulan at this point.

Root valency marking can be reconstructed to the Proto-Nyulnyulan verb, with *\*n(a)-* ~ *\*a-* on transitive stems and *∅-* on intransitive ones. The form *n(a)-* is found with singular subjects, while *a-* appears when the subject is plural. About thirty reconstructible roots may appear either with or without this prefix, but for the majority of verbs in all Nyulnyulan languages it is either obligatorily present or absent. Verbs which take variable prefixing are called ‘ambi-transitive’ in studies of Nyulnyulan languages. An example of an ambi-transitive verb with cognates is given in (2); the transitive marker is in boldface.

- (2) a. Bardi
- i. ***inmarra*** ‘he/she is cooking something’
  - ii. *imarra* ‘he/she/it is burning’
- b. Nyulnyul
- i. ***inamarrin*** ‘he’s cooking something’
  - ii. *imarrin* ‘it was burnt’
- c. Nyikina
- i. ***yinmarran*** ‘he’s cooking something’
  - ii. *yimarran* ‘it’s burning’ (e.g. a fire)

We can also reconstruct most subject person forms; *\*ŋa-* for first person singular, *\*mi-* for second person singular, *\*ku- -(a)rr* for second person plural, *\*ya-* for first person dual inclusive (1+2 in the following tables) and first person plural, and *\*yi-* for third person. There is also a plural marker *\*rr-*. A sample paradigm is given in Table 1. The future transitive forms are omitted because analogical restructuring in several languages has obscured the reconstruction of the Proto-Nyulnyulan forms.<sup>3</sup> Note that while I describe the Proto-Nyulnyulan forms in terms of morphemes, the same analysis would work in a word and paradigm framework with word-formation rules (for example Anderson 1992). The choice of description using morphemes is one of convenience and clarity of exposition, rather than theoretical preference.

The forms in Table 1 show vowels in hiatus in a few forms, for example in the future and irrealis plural subject forms. These simplify in the modern languages to a single short vowel, and

---

<sup>3</sup>The future prefix can be usually segmented as *ŋka-*; however, in several languages it fuses with either the transitive marker (giving forms such as *nk-*) or triggers changes in the form of the person prefix; there are different forms in each language and no evidence at this stage to choose between them.

Intransitive				
	present	past	irrealis	future
1	*ŋa-kama	*ŋa-ŋ-kama	*ŋa-la-kama	*ŋa-ŋka-kama
1+2	*ya-kama	*ya-ŋ-kama	*ya-la-kama	*ya-ŋka-kama
2	*mi-kama	*mi-ŋ-kama	*mi-la-kama	*mi-ŋka-kama
3	*yi-kama	*yi-ŋ-kama	*wa-la-kama	*wa-ŋka-kama
1	*ya-rr-kama	*ya-ŋ-arr-kama	*ya-la-arr-kama	*ya-ŋka-arr-kama
2	*ku-rr-kama	*ku-ŋ-arr-kama	*ku-la-arr-kama	*ku-ŋka-arr-kama
3	*yi-rr-kama	*yi-ŋ-arr-kama	*wa-la-arr-kama	*yi-ŋka-arr-kama
Transitive				
	present	past	irrealis	
1	*ŋa-n-kama	*ŋa-na-ŋ-kama	*ŋa-la-kama	
1+2	*ya-n-kama	*ya-na-ŋ-kama	*ya-la-kama	
2	*mi-n-kama	*mi-na-ŋ-kama	*mi-la-kama	
3	*yi-n-kama	*yi-na-ŋ-kama	*wa-la-kama	
1	*ya-rr-a-kama	*ya-ŋ-arr-a-kama	*ya-la-rr-a-kama	
2	*ku-rr-a-kama	*ku-ŋ-arr-a-kama	*ku-la-rr-a-kama	
3	*yi-rr-a-kama	*yi-ŋ-arr-a-kama	*wa-la-rr-a-kama	

Table 1: Proto-Nyulnyulan Reconstructed Paradigm

I assume that the same process was found in Proto-Nyulnyulan. Both vowels are written here to better show the regularities in the paradigms.

We are able to reconstruct further dependencies within the verb prefixes, and a few irregularities. Some of these involve interaction between subject number and other categories. Others concern stem morphophonology. For example, it seems that roots beginning with a palatal stop were marked only with the transitive prefix in both present and past tense, and not both tense and transitive marker, as appears with other obstruent-initial roots, illustrated above in Table 1. For example, in Bardi the form *i-n-jala-n* means both ‘he/she was watching (something)’ and ‘he/she is watching (something)’.

There are also dependencies between morphemes; for example, the form of the third person subject prefix depends on the tense of the verb, with *\*yi-* forms appearing in the present and past, and forms with *\*wa-* in the irrealis. Finally, there are morpheme ordering differences which are dependent on whether the subject is singular or plural. Subject number determines the relative order of the tense and transitivity markers. In the singular, transitivity precedes tense, while in the plural, the order is reversed and transitive marking appears following the tense and plural subject marker, as illustrated in (3) below.

- (3) a. *\*yi- na- ŋ- kama -na*  
3 TRANS- PAST- laugh -PAST  
“He laughed at it.”



- b. \**yi-* *ŋ-*     *arr-* *a-*     *kama -na*  
 3- PAST- PL- TRANS- laugh -PAST  
 “They laughed at it.”

Verb suffixes do not concern us here; it is sufficient to note that in all Nyulnyulan languages there are additional tense suffixes which co-occur with prefixes to specify further information regarding tense and aspect. See Bower (2004:Ch 8) for further discussion.

Thus it is possible to reconstruct for Proto-Nyulnyulan a four-way prefixal distinction between past, present and future tenses and irrealis modality. Transitivity is also marked in the prefix bundle and this interacts with the tense/aspect/mood categories.

## 2 The Nyikina changes

Such was the likely picture for Proto-Nyulnyulan. Between Proto-Nyulnyulan and Nyikina, there were three main changes in the organization of the verbal prefixes, along with a few minor changes which are likely to be independent. Note that these are not sound changes: the sound changes between Proto-Nyulnyulan and Nyikina are not extensive and do not affect apply to the segments discussed in this article. The most pervasive change is the loss of phonemic vowel length, though since no prefixes are reconstructed with long vowels the change does not affect the form of morphemes discussed here. The changes discussed here are clearly morphological, and can be summarized as in (4):

- (4) a. The distinction between present and past prefixes is lost.  
 b. The Proto-Nyulnyulan past morpheme is reanalyzed as an intransitive marker, and is generalized outside of its Proto-Nyulnyulan distribution.  
 c. The former four-way distinction in prefixes (past, present, future, irrealis) plus transitivity is reorganized as three binary distinctions: future or nonfuture, realis or irrealis, and transitive or intransitive.

The first of these changes is found in all Eastern Nyulnyulan languages, while the second and third are unique to Nyikina.<sup>4</sup> Section 2.1 gives a description of the Modern Nyikina verb system, while Section 2.2 presents the changes between Proto-Eastern Nyulnyulan and Nyikina. The interpretation of the changes is discussed in Section 2.3.

---

<sup>4</sup>A referee raised the possibility that a reanalysis of transitivity in the prefix bundle could have triggered the tense merger. While this would be possible if looking at the Nyikina data alone, the wider context of the changes make this unlikely. The tense merger is shared by all Eastern Nyulnyulan languages, while the transitivity reanalysis discussed here is confined to Nyikina. Moreover, since the way in which the past and present paradigms fall together is complex, and since the Eastern languages show identical reflexes of that change, such a change is likely to have happened only once.

## 2.1 Modern Nyikina's verb system

Contemporary Nyikina verbs have four prefix slots. My analysis here is based on the data in Stokes (1982) and Stokes (1985). It differs in some ways from Stokes (1982) and makes more explicit a few of the assumptions about prefix classes in Stokes (1985). For example, while Stokes (1982:237) gives six order classes, only four are needed for singular subjects and five for plural subjects. The transitive marker and reflexive/reciprocal marker never co-occur, as the reflexive/reciprocal verbs are obligatorily intransitive. I therefore treat them as a single order class.

(5)	Singular::	Person	Transitivity	Tense		(Reflexive)	Root	(Suffixes)
	Plural::	Person	Tense	Number	Transitivity	(Reflexive)	Root	(Suffixes)

Not all slots are filled in all paradigms. For example, the reflexive forms of the verb take no transitivity marker. There are also some irregularities in *n*-initial roots with plural transitive subjects, where the number marker coalesces with the initial consonant of the root (for example, *ya-rr-a-nika* 'we are following someone' is pronounced *yadika*). The relevant Nyikina paradigms are given in Table 2 below, using the root *kama* 'laugh/mock' as an illustration.

Some of the inflected forms directly continue Proto-Nyulnyulan material, while others are secondary innovations. Non-future realis and irrealis are archaic (though with semantic shift, for which see the following section); the person markers are archaic with the exception of the second person intransitive form *nyi-*, which is imported from the nominal possessive paradigm.<sup>5</sup> Future realis and irrealis forms are secondary innovations and are discussed below.

## 2.2 Changes between Proto-Nyulnyulan and Nyikina

As mentioned above, there were three main changes in the verb system between Proto-Nyulnyulan and Nyikina. First, all the Eastern Nyulnyulan languages lose the prefixal tense distinction between present (Proto-Nyulnyulan \**ø-*) and past (Proto-Nyulnyulan \**ŋ-*). That is, they merge the present and past paradigms into a single "non-future" paradigm. The singular subject forms merge identically in all Eastern Nyulnyulan languages, and since this change is a complex one, I assume it happened only once, in Proto-Eastern Nyulnyulan. That is, the tense merger involves the falling together of two paradigms in two different ways, and since the languages share the details of this change, it is highly likely that this change occurred before the breakup of Eastern Nyulnyulan. The plural subject forms are slightly different in each Eastern Nyulnyulan language; they appear to have been subject to secondary analogical formations (also discussed below). Finally, there are some further subsequent developments in the individual Eastern Nyulnyulan languages, such as

---

<sup>5</sup>Nyikina has a contrast between second person singular intransitive *nyi-* and transitive *mi-* in all forms; other Nyulnyulan languages have just *mi-* for second person; however, they have *nyi-* as a second person singular nominal possessive marker. Compare Bardi *ngi-nga* 'my name', *nyi-nga* 'your [sg] name', *ni-nga* 'his/her name', etc. Nyikina is innovative in this regard.

Singular	Intransitive Pers-Tr-Tns-root			Transitive Pers-Tr-Tns- root						
1- 1+2- 2- 3-	nga- ya- nyi- yi-	ɲ- ɲ- ɲ- ɲ-	kama kama kama kama	nga- ya- mi- yi-	n- n- n- n-	kama kama kama kama	Non-future Realis			
1- 1+2- 2- 3-	nga- ya- nyi- wa-	ɲ- ɲ- ɲ- ɲ-	a- a- a- a-	kama kama kama kama	nga- ya- wal- wa-	n- n- a- n-	a- a- kama a- kama	Future Realis		
1- 1+2- 2- 3-	nga- ya- nyi- wa-	la- la- la- la-	kama kama kama kama	nga- ya- mi- wa-	la- la- la- la-	kama kama kama kama	Non-future Irrealis			
1- 1+2- 2- 3-	nga- ya- nyi- wa-	rra- rra- rra- rra-	kama kama kama kama	nga- ya- mi- wa-	na- na- na- na-	rra- rra- rra- rra-	kama kama kama kama	Future Irrealis		
Plural Intransitive				Transitive						
	Pers- Tns-Num-Root			Pers- Tns-Num-Tr-Root						
1- 1+2- 2- 3-	ya- ya- ku- yi-	rr- rr- rr- rr-	kama kama kama kama	ya- yana- ku- yi-	rr- rr- rr- rr-	a- a- a- a-	kama kama kama kama	Non-future Realis		
1- 1+2- 2- 3-	ya- yana- wa- wa-	nga- rr- rr- nga- rr-	rr- rr- rr- rr-	kama kama kama kama	ya- yana- wa- wa-	nga- rr- rr- nga- rr-	a- a- a- a-	kama kama kama kama	Future Realis	
1- 1+2- 2- 3-	ya- ya- ku- wa-	la- la- la- la-	rr- rr- rr- rr-	kama kama kama kama	ya- ya- ku- wa-	la- la- la- la-	rr- rr- rr- rr-	a- a- a- a-	kama kama kama kama	Non-future Irrealis
1- 1+2- 2- 3-	ya- ya- gu- wa-	ya- ya- ya- ya-	rr- rr- rr- rr-	kama kama kama kama	ya- ya- gu- wa-	ya- ya- ya- ya-	rr- rr- rr- rr-	a- a- a- a-	kama kama kama kama	Future Irrealis

Table 2: Nyikina paradigms

the loss of the third person singular subject prefix *i-* in Warrwa, which trigger further morphological changes outside the scope of this paper.

As can be seen from Table 2, although Nyikina has preserved much of the material of Proto-Nyulnyulan verb prefixes, they are distributed rather differently. Instead of the four-way marking of tense/mood (past, present, future, irrealis), Nyikina has two binary categories around which paradigms are organized: future/non-future, and realis/irrealis (as illustrated in Table 2). Paradigms may also be transitive or intransitive, as in other Nyulnyulan languages.

The innovative Eastern Nyulnyulan non-future paradigm is a merger of former past and present forms. The past forms are continued in the intransitive singular, while other forms are based on the present. Table 3 shows which forms are lost from the old Nyulnyulan paradigm and which

	Intransitive			Transitive		
	present	past	irrealis	present	past	irrealis
	> non-Past		> Fut. Irr.	> non-Past		> Fut. Irr.
1	* <i>ŋa-kama</i>	* <i>ŋa-ŋ-kama</i>	* <i>ŋa-la-kama</i>	* <i>ŋa-n-kama</i>	* <i>ŋa-na-ŋ-kama</i>	* <i>ŋa-la-kama</i>
1+2	* <i>ya-kama</i>	* <i>ya-ŋ-kama</i>	* <i>ya-la-kama</i>	* <i>ya-n-kama</i>	* <i>ya-na-ŋ-kama</i>	* <i>ya-la-kama</i>
2	* <i>mi-kama</i>	* <i>miny-ŋ-kama</i>	* <i>mi-la-kama</i>	* <i>mi-n-kama</i>	* <i>mi-na-ŋ-kama</i>	* <i>mi-la-kama</i>
3	* <i>yi-kama</i>	* <i>yi-ŋ-kama</i>	* <i>wa-la-kama</i>	* <i>yi-n-kama</i>	* <i>yi-na-ŋ-kama</i>	* <i>wa-la-kama</i>
1	* <i>ya-rr-kama</i>	* <i>ya-ŋ-arr-kama</i>	* <i>ya-la-arr-kama</i>	* <i>ya-rr-a-kama</i>	* <i>ya-ŋ-arr-a-kama</i>	* <i>ya-la-rr-a-kama</i>
2	* <i>ku-rr-kama</i>	* <i>ku-ŋ-arr-kama</i>	* <i>ku-la-arr-kama</i>	* <i>ku-rr-a-kama</i>	* <i>ku-ŋ-arr-a-kama</i>	* <i>ku-la-rr-a-kama</i>
3	* <i>yi-rr-kama</i>	* <i>yi-ŋ-arr-kama</i>	* <i>wai-la-arr-kama</i>	* <i>yi-rr-a-kama</i>	* <i>yi-ŋ-arr-a-kama</i>	* <i>wa-la-rr-a-kama</i>

Table 3: Proto-Nyulnyulan reflexes in Nyikina paradigms

forms continue into Nyikina. The Proto-Nyulnyulan present/past column labels are given for convenience, with the meanings in modern Nyikina underneath.

One may wonder what triggered the tense prefix merger; since there is overt marking for past and present, it may seem an odd category to fall together. Two considerations are relevant. First, remember from §1.3 that we can reconstruct a few forms where present and past were homophonous, even in Proto-Nyulnyulan. That is, there is already some ambiguity in the paradigm, and a trigger point which could allow an analogical pattern to spread. Second, all Nyulnyulan languages have tense suffixes in addition to the prefixes, and these suffixes mark further tense/aspect distinctions with greater specificity than the prefixes. The tense prefixes are thus redundant, since they accompany marking which makes more distinctions. This appears to be reminiscent of Jespersen’s cycle in negation here, where forms are bleached, reinforced, and fall out of use (Van Kemenade 2000).

### 2.3 Present/Past merger: Exaptation

The collapse of the present-past distinction in prefixes leads automatically to a new opposition in prefix forms. Consider the forms in Table 4. Because of the way the past and present forms fell together, *ŋ-* no longer solely expressed past tense in Nyikina verbs, since the temporal range of verbs with this inflection can extend into the present. Moreover, it stands in formal opposition to the transitive marker *n(a)-*, and appears only in intransitive contexts. The following partial paradigm of the verb *kama* ‘laugh (intr), mock (tr)’ makes this clear. The opposition in a larger paradigmatic context can also be seen in (3) and Table 2.

	Non-fut. Intrans. Realis	Non-fut. Trans. Realis
1	<i>ŋa-ŋ-kama</i>	<i>ŋa-n-kama</i>
1+2	<i>ya-ŋ-kama</i>	<i>ya-n-kama</i>
2	<i>nyi-ŋ-kama</i>	<i>mi-n-kama</i>
3	<i>yi-ŋ-kama</i>	<i>yi-n-kama</i>

Table 4: Nyikina Non-future Forms

The prefix *ŋ-* is overtly marking the category “intransitive” in an opposition between transitive (marked by *n-*) and intransitive. This alternation between *ŋ-* for intransitive stems and *n(a)-* for transitive ones is also found in the future realis:

	Fut. Intrans. Realis	Fut. Trans. Realis
1	ŋa- <b>ŋ</b> -a-kama	ŋa- <b>n</b> -a-kama
1+2	ya- <b>ŋ</b> -a-kama	ya- <b>n</b> -a-kama
2	nyi- <b>ŋ</b> -a-kama	(wala-kama) <sup>6</sup>
3	wa- <b>ŋ</b> -a-kama	wa- <b>n</b> -a-kama

Table 5: Nyikina Future Forms

Examples such as the paradigm in Table 5 show that the prefix *ŋ-* is no longer associated with past tense, since the prefix appears in the future (realis) paradigms. Thus despite its etymology, there is clear evidence from the current distribution of forms in paradigms that *ŋ-* is now straightforwardly the marker of intransitivity.

### 3 Discussion

#### 3.1 Categorizing the Change

There are several possible ways to interpret the Nyikina reanalysis of the past marker as an intransitive marker. The first is to consider this change a type of semantic change; that is, it is possible to frame the change of *ŋ-* marking past to intransitive in terms of a change in the meaning of the morpheme. There are numerous examples of semantic change in morphemes in the literature, so *a priori* such a change would not be unexpected.

The semantic categories involved in the meaning change speak against such an analysis, however. While there is a correlation in languages between tense and transitivity, the Nyikina change would go against well-established directions of correlation. Where transitivity is correlated with tense (or where there are transitivity or case dependencies on tense), the past tenses are *more* transitive, not less transitive. For example, in languages where there is differential object marking and certain tenses require morphology which involves a decrease in transitivity (e.g. by marking objects with an oblique case), past contexts are associated with the more transitive morphology, not the less transitive items. This presumably relates to the fact that past, achieved events can be presumed to have affected their objects; object of events which are less completed are by logic less affected. Thus a change which *semantically* associates past tenses with decreased transitivity is implausible. This is particularly true for Nyulnyulan languages such as Bardi and Nyikina, where the past tense, in combination with a tense suffix, has a default interpretation of completed or perfective aspect unless explicitly marked to the contrary.<sup>7</sup>

<sup>6</sup>The second person transitive form *wala-* continues an old irrealis form.

<sup>7</sup>For further discussion of the relationship between tense, aspect, and transitivity, see Hopper and Thompson (1980),

There is a further objection. Characterizing the change under discussion as a semantic change affecting a single morpheme fails to account for the important fact that the change is part of a larger paradigm reorganization; the change is also bound up in the reformation of marking of oppositions between future and non-future, and transitive and intransitive more generally. The change in meaning of the intransitive marker  $\eta$ - is a consequence of its paradigmatic opposition to the transitive marker. The marking of intransitives in this way was then generalized through analogy to other parts of the paradigm, but the trigger of the change was the combination of a tense merger and the loss of null-marked present forms; that is, it was unrelated to transitivity.

An alternative analysis would be to consider the change as a type of exaptation (Lass 1990). Recall that exaptive changes are those where “empty” or “semantically bleached” items are recruited to mark a new function. The Nyikina change fits part of the definition of an exaptive change, in that it involves the “opportunistic co-option of a feature whose original is unrelated (or only marginally related) to its earlier use,” (Lass 1990:80). Furthermore, since exaptation is a change that applies to semantically bleached items, and since speakers have no access to earlier stages of their language, prior meanings should not be accessible, and therefore should not be able to play a role in exaptive changes.

Here again, however, semantics are a problem. A growing body of literature finds that lexical semantic principles *are* important in exaptive changes, despite Lass’ original claims that meaning was irrelevant to mapping (see, for example, Vincent 1995:435 and Smith 2006, 2008). Smith in particular has argued that while exaptation does involve semantic bleaching of the functional content of the morphology, the items nonetheless exhibit some more abstract, residual opposition such as frequency or functional markedness, which may then be co-opted to guide the refunctionalization. Smith (2008:345–346) uses examples from Tiwi pronominal marking, where an inclusive–exclusive distinction is reanalyzed as a tense distinction, with exclusive forms in past meaning and inclusive forms in non-past meaning. Smith argues that the inclusive is mapped onto the non-past – rather than to the past tense – because both inclusive and non-past are “core” with respect to the categories each marks. He calls this principle “core to core mapping.”

Smith’s arguments for Tiwi cannot be used in our Nyikina case, however. The first reason lies in the nature of the change. The change of past marker to intransitive does not seem to be the result of a reanalysis of an opposition. It is not the case that the past–present opposition is co-opted to mark an intransitive–transitive one. The distinction is lost and one part of the opposition is recruited to new marking. The sole cause of the change seems to be the way that the  $\eta$ - stands in relation to the transitive  $n$ -. That is, forms in which there is overt morphological material in contrast to the transitive marker keep that morphology. Secondly, we must remember that the Nyikina change is not the refunctionalization of one opposition to mark a new opposition; rather,

---

Tsunoda (1985), DeLancey (1982) and the papers in Abraham et al. (1999).

it is a change where one form comes to be interpreted as standing in opposition to another. The trigger for the change, however, occurs elsewhere in the word.

### 3.2 Implications for theories of paradigms

The changes in Nyikina have implications for how paradigms as a theoretical construct are treated in historical linguistics and linguistic theory. As many have noted (for example, Haspelmath 1999, Hayes 1999), paradigms have no theoretical status in many models of morphological theory; rather, they are considered as epiphenomenal; a result of what happens when fully inflected forms are set out side by side, without independent theoretical status and derivable through other parts of the theory.

Some recent work has attempted to address the question of how language users or language learners might make use of paradigms. As Bobaljik (2001:53) writes, “does knowledge of language (grammar) include knowledge (memorization) of paradigms themselves, or just the pieces that constitute paradigms and the rules for generating them?” Bobaljik argues against using paradigms as a formal object in synchronic theories of grammar, on the basis that facts traditionally argued to point to paradigms — such as syncretism — can be captured in paradigm-less theories of morphology, such as Distributed Morphology (Halle and Marantz 1993).

Bobaljik (2004, 2001) are explicit that the arguments against paradigms apply to synchronic morphology. But *change* in morphology might provide us with clues to whether language learners use paradigms in acquiring their languages. When a system is reconstructed, we gain evidence as to which facets of a paradigm are particularly salient to speakers. It is very difficult to explain changes of the type described here for Nyikina without appeal to forms standing in paradigmatic opposition. In this case, the Nyikina change was driven by the place of the morpheme in the word, and the way it stood in opposition to the transitive marker in some forms. After all, how would a learner come to the conclusion that *ŋ-* marks a verb that is “intransitive” without a comparison to transitive forms with an overt marker *n-*? While diachronic change might not tell us the best synchronic analysis of a phenomenon, it does provide us with evidence for how speakers view relationships among forms, and the conclusions that children acquiring language draw about the systems that underly the morphology of their language. If synchronic models of grammar are to capture these facts, paradigms are indispensable.

There is an alternative view. It could be that the answer lies in separating theories of learnability which make reference to paradigms from theories of grammatical competence – that is, synchronic I-language models of grammar – which do not. Children acquire morphological distinctions by drawing conclusions about alternations, based on the evidence of their language. But whether they store that information in paradigms once they have acquired it is a different question. Such a view makes predictions about the types of change which could occur through child language acquisition, and those which would be spread through a language through social processes

enacted by adults. At this point, however, we do not have the data which would allow such a prediction to be tested.

### **3.3 Implications for morphological reconstruction**

The changes discussed here show us that even quite closely related languages can undergo changes in their inflectional systems which render morphological analyses opaque, and which render morphological meanings non-cognate. It has long been known that there are problems in the use of morphology in classification and reconstruction, when such evidence is used alone, without further analysis of lexicon and sound change. Yet despite this knowledge, classification of morphology alone still appears to be alluring. For example, McGregor and Rumsey (2009:68–74), in their discussion of Worroran verb prefixation, give only morphemes, and not fully inflected paradigms, and Evans (2003:19) simply gives person prefix forms in discussion of wider relationships between Non-Pama-Nyungan language families. Within Australia, linguists have tended to concentrate on morphological evidence rather than lexical evidence, because morphology is less likely to be borrowed, a point discussed by Campbell (2004) and Campbell and Poser (2008). Changes like the Nyikina one reinforce the fact that while morphology may be less borrowable, it is not immune from change, and comparison of morphemes in complex paradigms, without considering full forms, can be rather misleading. In the case discussed here, the languages are closely related and both roots and affixes show a high degree of cognacy, and this allows the straightforward identification of the change. In proposals for relationship that rely on morphology alone, however, such evidence may well be lacking.

## **4 Conclusions**

In conclusion, we see in Nyikina a case of a change where an analogical change is facilitated by another change elsewhere in the word; that is, a refunctionalization of morphology which is ‘coerced’ by an earlier change. Nyikina reflects a reorganization of Proto-Nyulnyulan prefixal morphology, whereby a four-way opposition in tense—mood marking has been reanalyzed as two two-way oppositions between non-past and past, on the one hand, and realis—irrealis on the other. The change in the tense—mood system has triggered a reanalysis in the prefixal morphology, such that the old Proto-Nyulnyulan past tense prefix now marks intransitive verbs. Because the languages of the family are fairly closely related, and the material used to mark these oppositions remains cognate, the systemic changes can be tracked and reconstructed with a fair degree of certainty.

This type of change does not easily fit within existing typologies of morphological change, and it provides an insight into possible changes in complex paradigms more generally. The Nyikina reanalysis of past as intransitive is not a semantic change, and while it bears some similarities to other morphological refunctionalizations, the details of the change are sufficiently different to warrant a place in typologies of morphological change. This work in turn provides further



evidence for the status of paradigms in synchronic description, and for the need for care in using only morphology in historical reconstruction.

## References

- Abraham, W., L.I. Kulikov and V.P. Nedid'alkov. 1999. *Tense-aspect, transitivity and causativity: essays in honour of vladimir nedjalkov*, vol. 50. John Benjamins Publishing Company.
- Anderson, Stephen R.. 1988. Morphological change. vol. 1, chap. 13, 324–362. Cambridge: Cambridge University Press.
- Anderson, Stephen R. 1992. *A-Morphous Morphology*, vol. 62, Cambridge Studies in Linguistics. Cambridge: Cambridge University Press.
- Bobaljik, J.D. 2004. Paradigms, optimal and otherwise: A case for skepticism. *Ms., University of Connecticut, Storrs*.
- Bobaljik, Jonathan. 2001. Syncretism without paradigms: Remarks on Williams 1981, 1994. *Yearbook of Morphology*.
- Bowern, Claire. 1998. *The case of Proto-Karnic*. BA Honours Thesis, Australian National University, Canberra, Australia.
- Bowern, Claire. 2004. *Bardi verb morphology in historical perspective*. PhD dissertation, Harvard University, Cambridge, Massachusetts.
- Campbell, Lyle. 2004. Foreword. In Claire Bowern and Harold Koch (eds.), *Australian languages: classification and the comparative method*, vol. 249, Current Issues in Linguistic Theory, xi–xii. Amsterdam: John Benjamins.
- Campbell, Lyle and William Poser. 2008. *Language classification: history and method*. Cambridge: Cambridge University Press.
- Chafe, Wallace. 1998. How a historical linguist and a native speaker understand a complex morphology. In Monika S. Schmid, Jennifer R. Austin and Dieter Stein (eds.), *Historical linguistics 1997: Selected papers from the 13th international conference on historical linguistics*, 101–116. Amsterdam: John Benjamins.
- Chafe, Wallace. 1999. Florescence as a force in grammaticalization. In Spike Gildea (ed.), *Reconstructing grammar: Comparative linguistics and grammaticalization*, 39–64. Amsterdam: John Benjamins.
- Darnell, Regna and Joel Sherzer. 1971. Areal linguistic studies in North America: A historical perspective. *International Journal of American Linguistics* 37(1). 20–28. URL <http://www.jstor.org/stable/1264958>.
- DeLancey, S. 1982. Aspect, transitivity and viewpoint. In Paul Hopper (ed.), *Tense-aspect: be-*

- tween semantics & pragmatics: containing the contributions to a symposium on tense and aspect, held at ucla, may 1979*, vol. 1, 167. Amsterdam: John Benjamins.
- Evans, Nicholas. 2003. *Bininj gun-wok: a pandialectal grammar of Mayali, Gunwinygu, and Kune*. Canberra: Pacific Linguistics. 2 vols.
- Fox, Anthony. 1995. *Linguistic reconstruction: An introduction to theory and method*. Oxford: Oxford University Press.
- Halle, Morris and Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In Jay Keyser and Kenneth Hale (eds.), *The view from building 20*, 111–177. MIT Press.
- Haspelmath, Martin. 1999. Optimality and diachronic adaptation. *Zeitschrift für Sprachwissenschaft* 18. 180–205.
- Hayes, Bruce. 1999. Phonetically-driven phonology: The role of optimality theory and inductive grounding. In Michael Darnell, Edith Moravcsik, Michael Noonan, Frederick Newmeyer and Kathleen Wheatly (eds.), *Functionalism and formalism in linguistics*, vol. I, 243–285. Amsterdam: John Benjamins.
- Heath, Jeffrey. 1997. Lost wax: Abrupt replacement of key morphemes in Australian agreement complexes. *Diachronica* 14. 197–232.
- Heath, Jeffrey. 1998. Hermit crabs: formal renewal of morphology by phonologically mediated affix substitution. *Language* 74(4). 728–759.
- Hock, H.H. and B.D. Joseph. 1996. Language history, language change, and language relationship: An introduction to historical and comparative linguistics .
- Hopper, P. and Thompson. 1980. Transitivity in grammar and discourse. *Language* 56(1). 251–95.
- Hosokawa, Komei. 1991. *Meaning in Yawuru: A semantically oriented description of an indigenous language of the Kimberley region, Western Australia*. Canberra: to be published by Pacific Linguistics. [author's Ph.D. Thesis, Australian National University].
- Hymes, Dell. 1956. Na-Déné and positional analysis of categories. *American Anthropologist* 58(4). 624–638.
- Koch, Harold. 1996. Reconstruction in morphology. In M. Durie and M Ross (eds.), *The comparative method reviewed; regularity and irregularity in language change*, chap. 8, 218–263. New York: Oxford University Press.
- Koch, Harold. 1997. Comparative linguistics and Australian prehistory. In *Archaeology and linguistics: Aboriginal Australia in global perspective*, chap. 3, 27–43. Melbourne: Melbourne University Press.
- Lass, Roger. 1990. How to do things with junk: exaptation in language change. *Journal of*

- Linguistics* 26(1). 79–102.
- Lee, Jennifer. 1987. *Tiwi today: study of language change in a contact situation*. Canberra: Research School of Pacific and Asian Studies, Australian National University.
- McGregor, W. and A. Rumsey. 2009. *Worrorran revisited: the case for genetic relations among languages of the Northern Kimberley region of Western Australia*. Canberra: Pacific Linguistics.
- McGregor, William. 1994. *Warrwa*, vol. 89, Languages of the World Materials. München: LINCOM Europa.
- McGregor, William and Bronwyn Stokes. 2004. Classifying the Nyulnyulan languages. In Nicholas Evans (ed.), *The non-Pama-Nyungan languages of northern Australia: comparative studies of the continent's most linguistically complex region*. Canberra: Pacific Linguistics.
- Sapir, Edward. 1921. *Language: An introduction to the study of speech (first edition)*. New York: Harcourt, Brace and company.
- Smith, John Charles. 2006. How to do things without junk: the refunctionalization of a pronominal subsystem between Latin and Romance. In Jean-Pierre Y. Montreuil (ed.), *New perspectives on Romance linguistics*, 183–205. John Benjamins.
- Smith, John Charles. 2008. The refunctionalisation of first-person plural marking in Tiwi. In Claire Bower, Bethwyn Evans and Luisa Miceli (eds.), *Morphology and language history: in honour of Harold Koch*, 341. John Benjamins Pub Co.
- Stokes, Bronwyn. 1982. *A description of the Nyigina language of the Kimberley region of Western Australia*. PhD thesis, Australian National University, Canberra.
- Stokes, Bronwyn. 1985. The verb from Noonkanbah to Broome: Alternative-prefixing verbal systems of the West Kimberley. Australian Institute for Aboriginal and Torres Strait Islander Studies, MS. 3139.
- Thomason, Sarah. 1980. Morphological instability, with and without language contact. In J Fisiak (ed.), *Historical morphology*, 359–372. The Hague: Mouton.
- Thomason, Sarah and Terrence Kaufman. 1988. *Language contact, creolization and genetic linguistics*. Berkeley and Los Angeles: University of California Press.
- Tsunoda, T. 1985. Remarks on transitivity. *Journal of Linguistics* 385–396.
- Van Kemenade, A. 2000. Jespersen's cycle revisited: formal properties of grammaticalization. In Susan Pintzuk, George Tsoulas and Anthony Warner (eds.), *Diachronic syntax: Models and mechanisms*, 51–74. Oxford: Oxford University Press.
- Vincent, Nigel. 1995. Exaptation and grammaticalization. In Henning Andersen (ed.), *Historical linguistics 1993: Selected Papers from the 11th International Conference on Historical*

*Linguistics, Los Angeles, 16-20 August*, 433–448. Amsterdam: John Benjamins.