

John Benjamins Publishing Company



This is a contribution from *Language Description Informed by Theory*.

Edited by Rob Pensalfini, Myfany Turpin and Diana Guillemin.

© 2014. John Benjamins Publishing Company

This electronic file may not be altered in any way.

The author(s) of this article is/are permitted to use this PDF file to generate printed copies to be used by way of offprints, for their personal use only.

Permission is granted by the publishers to post this file on a closed server which is accessible to members (students and staff) only of the author's/s' institute, it is not permitted to post this PDF on the open internet.

For any other use of this material prior written permission should be obtained from the publishers or through the Copyright Clearance Center (for USA: www.copyright.com).

Please contact rights@benjamins.nl or consult our website: www.benjamins.com

Tables of Contents, abstracts and guidelines are available at www.benjamins.com

The reconstruction of inflectional classes in morphology

History, method and Pama-Nyungan (Australian) verbs

Harold Koch

Australian National University

This paper* surveys the approaches that have been taken to the synchronic description of the inflectional classes of verbs of the Pama-Nyungan family of Australian languages, highlighting problems with the application of the concept of the morpheme, and the notion of “conjugation markers”. It then summarizes and critically assesses attempts to reconstruct the prehistory of Pama-Nyungan verb inflection, considering primarily the contrasting approaches of Dixon (1980, 2002) and Alpher (1990). The methodological requirements for such a reconstruction are then discussed. Finally, the proposed principles are applied first to the internal reconstruction of verbs in Walmajarri, a language of the Ngumpin-Yapa subgroup, then to the comparative reconstruction of some Pama-Nyungan (monosyllabic) verbs that display heterogeneous patterns of inflection.

1. The synchronic description of Australian verb inflection

In all Australian languages verbs inflect, typically by means of suffixes, for tense, aspect, and mood (TAM) categories. For many of the languages verbs do not all inflect according to the same pattern but fall into a number of inflectional classes, typically called “conjugations”. The language learner needs to memorize

* This paper is partially based on a presentation “Neogrammarian principles and the reconstruction of Australian verb inflection” to the 16th International Conference on Historical Linguistics, Copenhagen, August 2003. I am pleased to offer this study to Mary Laughren, who shares my interest in reconstructing verb inflection in languages of the western part of Australia. I acknowledge research support from a small grant from the Faculties Research Grants Scheme of the Australian National University in 2002, and feedback on an earlier draft from Claire Bowern and two anonymous reviewers. I accept responsibility for any remaining errors.

which pattern of inflections is appropriate for each lexical verb. This principle was described as follows in an early modern description of the Western Desert language:

For the Warburton Ranges dialect the form of the Command suffix which each Verb Stem takes must be memorized ... these differing forms of the Command suffix divide Verbs into FOUR CLASSES. These VERB CLASSES may be labelled according to the form of the Command suffix which each takes, e.g. “The -la Class”, “The zero Class”, etc. Verbs must be memorized according to their classes, as the predictability of all other suffixes, such as Tense and Aspects, is dependent upon these class distinctions. (Douglas 1964: 34)

In pre-modern descriptions that followed the Traditional Grammar approach that has been used for centuries to teach European languages, sample paradigms were simply listed without any attempt to describe which part of the word expressed which lexical or grammatical aspect of its meaning.¹ Since morphemic analyses have been applied to the Australian languages, however, problems have arisen with the segmentation of verb forms.² To illustrate the issues, I offer sample paradigms of Western Desert (Warburton Ranges dialect) in Table 1, using a space to set off the suffixes.³

Note that each class is labelled after the inflection of the Imperative; in fact, it is the Imperative inflection that shows the most divergence between the classes. Consider the Future forms: one could make a case that Future is signalled by *-ku* for each class and that this suffix is preceded by *Ø*, *ng*, *n*, and *l* according to the class. One could go so far as to claim that the distinguishing consonant (or lack of any consonant) is in fact a part of the verb stem. A similar analysis almost works for the Continuous Imperative forms: an invariant suffix *-ma* is added to a verb

1. For a contrast between early descriptions according to the Traditional Grammar model and modern structuralist approaches, with reference to the grammatical sketches of R.H. Mathews, see Koch (2008).

2. For the contrast between morphemic and Word-and-Paradigm models, see Mathews (1972, 1991) and Anderson (1992). Hockett (1954) mentioned Traditional Grammar as an alternative model to the Item-and-Arrangement and Item-and-Process models he described. See Koch (1990) for a discussion of morphemic vs. Word-and-Paradigm approaches to the morphology of Australian languages.

3. I have standardized the spelling of all Australian languages cited, except in quotations from others, as follows: voiceless symbols are used for obstruents unless they are contrastively voiced; of the rhotics, *r* is used for the approximant, *rr* for the tap/trill, and *rrh* for a trill that contrasts with the tap; digraphs *rt*, *rn*, *rl* indicate retroflex consonants; digraphs *th*, *nh*, *lh* indicate laminodentals; and *ty*, *ny*, *ly* indicate palatals, in languages that have contrasting laminodentals, or the general laminals, in languages that do not contrast dentals and palatals.

Table 1. Western Desert (Warburton Ranges) sample verb paradigms

Category\Class	talk Ø	hit wa	put rra	run la
Future	<i>wangka ku</i>	<i>pu ngku</i>	<i>tyu nku</i>	<i>kukurra lku</i>
Cont. Impv.	<i>wangka ma</i>	<i>pu ngama</i>	<i>tyu nama</i>	<i>kukurra nma</i>
Past	<i>wangka ngu</i>	<i>pu ngu</i>	<i>tyu nu</i>	<i>kukurra rnu</i>
Imperative	<i>wangka</i>	<i>pu wa</i>	<i>tyu rra</i>	<i>kukurra la</i>
Present	<i>wangka rra</i>	<i>pu ngkula</i>	<i>tyu nkula</i>	<i>kukurra ra</i>

stem that ends in Ø, *ng*, *n*, or *l*, provided we make some minor adjustments at the morpheme boundary. These adjustments seem relatively “natural”: a vowel *a* is inserted within the consonant clusters *ng+m* and *n+m* and the *l* is assimilated to *n* before the nasal *m*. Such alterations to hypothetical forms could be justified if it could be shown that the offending clusters *ngm* and *nm* are disallowed by the phonotactics of the language. Unfortunately this is not totally true, since *nm* is quite acceptable. For the Past inflection the most plausible candidate for an invariant suffix would be *-ngu*; the form for the *wa* class could be analysed as being reduced from an underlying *ng-ngu* by the deletion of the second consonant (since this cluster does not occur otherwise), and the retroflex *rn* of the *la* class might result somehow from an alteration of a non-permitted cluster *l+ng*. In this approach the Imperative may possibly be explained in terms of an invariant suffix *-a* added to stems ending in a vowel, *ng*, *n* and *l* respectively; no change would be required to generate the *la* form; the Ø class form would simply require the deletion of the first of two vowels; the *wa* and *rra* classes, however, would require unmotivated changes of *ng* to *w* and *n* to *rr* in an intervocalic position, in spite of the fact that the original sequence is easily tolerated by the phonotactics. Finally, the Present inflections consist of a suffix *rra* in the Ø class and *ra* in the *la* class, but in the other two classes *la* is added to the inflected form of the Future. An attempt to explain these in terms of an invariant suffix added to an invariant stem would have to start from *la* and would require adjustments that insert *ku* after *ng* and *n*, change the sequence *l+rr* to *r*, and alter the *l* between vowels (in the Ø class) to *rr*.

There are three possible solutions to the problem of how to deal with the recurrent consonants in a morphemic analysis: they can be assigned to the suffix, to the verb stem, or be treated as a separate morpheme, whose meaning would be limited to indicating the inflectional class of the lexical stem. Since the advent of Generative Phonology in the 1960s an attractive solution has been to posit wherever possible invariant morpheme shapes at an abstract or “underlying” level and

to specify the differences in the “surface form” by an appeal to a set of unidirectional morphophonemic (or preferably labelled “phonological”) rules that would effect the necessary alterations in the most general manner possible.⁴ It was also considered preferable to build all arbitrary elements into the lexical stem, a consideration which favours assigning the characteristic consonant to the lexical stem, which is by its nature arbitrary. This avoids the need to assign labels such as “class 1/2/3/4” or “Ø/wa/rra/la-class” to the lexical stems; this distinguishing information is rather available by inspecting the final segment of the lexical entry of the stem: e.g. *wangka-*, *pung-*, *tyun-*, *kukurral-*.

An example of explicit “morphophonemic changes” that apply to invariant stem plus suffix combinations to produce the proper Irrealis forms of Walmajarri is given by Hudson (1978: 12), and reproduced in Table 2.

Table 2. Walmajarri morphophonemic rules for Irrealis, according to Hudson (1978)

	Underlying form		Surface form
“stand”	<i>karri+ta</i>	->	<i>karri</i>
“chop”	<i>patyarr+ta</i>	->	<i>patyarra</i>
“carry”	<i>kang+ta</i>	->	<i>kangka</i>
“speak”	<i>many+ta</i>	->	<i>manytya</i>

The verb stems in question are described as belonging to the Ø, *rr*, *ng*, and *ny* classes, according to the final consonant (if any) of the underlying verb stem. These rules effect deletions and alterations of phonological segments within morpheme combinations. These particular rules are restricted to lexical stems and not of a general nature applying to all instances where the given phonemes are found in the same environment.

In the system of description promoted by R.M.W. Dixon, the characteristic consonants have been labelled “conjugation markers”.⁵ Dixon (1980: 382–430, Section 12.2 “Conjugations”; cf. 279–280, Section 9.4.2) discusses the nature of

4. See, for example, Schane (1973). This generativist concept represented a formalization of the practice of earlier linguists, such as Bloomfield (1939).

5. It is worth noting that Dixon did not use the concept of conjugation marker in his earlier Dyirbal grammar but analysed verb stems as ending in a consonant (the liquids *l* or *r*, or *y*) or zero: “depending on the analysis appropriate to the language, the liquid will be recognised either as the final segment of the verb roots belonging to this conjugation or else as the initial segment of some of the affixial allomorphs” (Dixon 1972: 13). The term conjugation marker appears to be due to Ken Hale. (I thank a reviewer for this insight.)

conjugations in Australian languages. There is often a statistical correlation between classes and transitivity. There are usually two open classes: one consisting predominantly of transitive verbs and one containing mainly intransitive verbs. Some verb classes may contain just a few members. Conjugations carry no semantic information: they are just arbitrary determiners of the form of inflectional suffixes. The example of Yidiny (from north-eastern Queensland), as presented in Dixon (1980: 383), is reproduced in Table 3.

Table 3. Yidiny verb classes

Conjugation label	1 - <i>n</i>	2 - <i>l</i>	3 - <i>r</i>
Size of class	open	open	20+
Sample verbs	<i>pala</i> - “be open” <i>nyina</i> - “sit”	<i>wawa</i> - “see” <i>patya</i> - “bite”	<i>patya</i> - “leave” <i>payka</i> - “feel sore”
IMPV	<i>n</i>	Ø	<i>rr</i>
PRES/FUT	<i>ng</i>	<i>l</i>	<i>r</i>
PAST	<i>nyu</i>	<i>lnyu</i>	<i>rnyu</i>
PURP	<i>na</i>	<i>lna</i>	<i>rna</i>
APPR	<i>nty</i>	<i>lty</i>	<i>rty</i>

Comparing forms across classes, by reading along each row in the table, one observes that the forms that express a given TAM value are partially alike (e.g. PAST *nyu*, *lnyu*, *rnyu*). Comparing different TAM forms within a given class, by reading down a column, one observes that these forms often share an initial consonant: *n*, *l*, or *r*. Dixon calls these characteristic consonants “conjugation markers (CMs)”. The classes are then named by this CM: *n*-class, *l*-class, *r*-class. The verb stems are cited with the CM attached; for example, *pala-n*, *wawa-l*, *patya-r*. The structure of inflected verb words is described as Stem-CM-TAM. While this kind of labelling provides a handy way of referring to the inflections, one can easily see how difficult it would be to provide a set of natural rules which would derive the IMPV and PRES/FUT inflections from the interaction between an invariant suffix and the *l* or *r* conjugation marker.

It can easily be seen that there are a number of problems with describing such verbal inflections within a morphemic approach, especially using the device of a “conjugation marker”. First, the CM is not present in all the inflectional forms of its class. Second, the consonants of the TAM suffix are not all easily explicable in terms of a phonological interaction with a preceding CM consonant. Third, attempts to derive all inflected forms from the combination of invariant underlying forms of a stem plus suffix require clumsy and otherwise unmotivated morphophonemic

processes. Fourth, some inflected forms include material that “cannot be straightforwardly assigned to either the root or the tense/aspect/mood suffixes”, in the terminology of Harvey (2008: 123).

Even worse for an approach (such as morphemics) that attaches meaning directly to formal parts of the word, some inflections clearly appear to consist of a suffix added to what is already another inflected form. This phenomenon of “parasitic” formations, in which the stem for one part of a paradigm is derived from that of another” (Matthews 1991: 183), is actually relatively widespread in Australian verb inflection. Thus in two of the four conjugations of the Warburton Ranges dialect of Western Desert (see Table 1) the Present forms of “hit” and “put”, *pungkula* and *tyunkula*, are transparently based on the respective Future forms *pungku* and *tyunku*. Goddard (1985) employs a further descriptive technique in his description of verbs in the Yankunytjatjara dialect of Western Desert. He gives labels to the three stems that are used to build a full set of inflections (which number over a dozen), calling them “Perfective”, “Imperfective”, and “Neutral”. For the verb roots “hit” and “put” (as in Table 1 above), these are: *pu-*, *punga-*, *pungku-*, and *tyu-*, *tyuna-*, *tyunku-* respectively. The third stem is identical to the Future form for these two classes: for *patya-* “bite”, in the equivalent of the *-la* class of Table 1, it is *patyal-*.

2. Reconstruction of Australian verb inflection

The most prevalent discourse concerning the prehistory of Australian verbs has centred on Dixon’s (1980, 2002) reconstructions. Although his data was taken primarily from languages classed as Pama-Nyungan (PN) by most Australianists, some discussions of non-Pama-Nyungan (nPN) verbal comparative data have commented on his results, which in the 1980 version were claimed to represent Proto Australian (pA). Because of the influence of Dixon’s discussions, it is appropriate to summarize his procedures and results, and to use his discussion as a point of departure in further discussions of the methodological considerations appropriate for the reconstruction of inflectional classes.

2.1 Dixon’s reconstruction

Dixon first presents the inflections of Yidiny as an illustration of a conjugational system, and gives an analysis in terms of root followed by optional conjugational marker morpheme followed by final inflection, which may be Ø. This analysis includes the consequence that forms of a conjugation 3 verb (whose CM is *r*) such as *patya-r* “leave” are analysed as Imperative *patya-rr* “leave-Ø” (with no

CM present) but Present-Future *patya-r-Ø* “leave-CM-PRES/FUT”, where “the present-future inflection appears to involve just the conjugation marker” (Dixon 1980:384).⁶

He then discusses four representative languages that have conjugations (some languages lack inflectional classes altogether): Walmajarri, Western Desert (Pintupi and Ngaanyatjarra dialects), Guugu Yimidhirr, and Nyawaygi. He notes how many verbs are in each class, whether the classes are open or closed, whether they contain monosyllabic stems, and to what extent each class aligns with the transitivity of the stem, and presents a table of inflections organized according to conjugation class and inflectional (Tense-Mood) category. He then applies internal reconstruction within each language, positing earlier forms consisting of verb root, invariant CM, and invariant final suffixes, then discusses the phonological changes required to produce the actually occurring forms. He declares that the required developments are for the most part “quite natural” (Dixon 1980:386). He then compares the classes with respect to their lexical members (especially monosyllabic verb roots), transitivity, and conjugation markers and concludes that this information (assembled in Dixon’s (1980:400–401) Table 12.6) “should be sufficient to demonstrate the correspondence of conjugational classes between languages in different parts of the continent”.

In Section 12.2.2, “Reconstruction” (Dixon 1980:402–408), he proposes, on the basis of the previous comparisons plus other languages that have verb conjugations, that seven conjugations can be reconstructed for the “non-prefixing region” (which roughly correlates with the PN family). These classes are labelled according to their CM: *Ø*, *y*, *ng*, *n*, *m*, *l*, *rr*. He indicates verb roots (especially monosyllabic ones) that can be assigned to each of these conjugations. Then in Section 12.2.3, “The Proto-Australian verbal system” (Dixon 1980:408–411), he proposes that in Proto-Australian the verb structure was simply ROOT+INFLECTION, without the CM that he posits for modern languages, with “a simple agglutinative-type structure, where the morpheme boundary between root (or stem) and affix would have been consistently and clearly recognisable” (p. 409). Roots could end in a vowel or one of the six consonants that had previously been identified as CMs. “Every modern language has undergone some phonological changes involving the final consonant of the root and the first segment of the most common inflections – assimilations, blendings, deletions, epentheses, and the like”, which has led to structures in which the erstwhile root-final consonant “still occurs in some

6. Dixon later (2002:223) comments that “the term ‘conjugation marker’ was simply intended as a useful shorthand in synchronic analysis for the consonant that comes between root-final vowel and inflectional allomorph at some positions in some modern languages”.

verbal forms, but is now most revealingly regarded as a morpheme that ‘marks’ that conjugation” (1980:409). The proposed pA verb structure is reinforced, it is claimed, by the fact that the root-final segments posited equate with the word-final consonants allowed by Dixon’s pA phonotactics; verb roots in this scenario had the same phonotactic structure as whole words.

Now, if we put together the consonant-final monosyllabic verb roots posited by Dixon with his three proto-suffixes (Past *-nhu, Imperative *-ka and Purposive *-ku), we get the implied reconstructions shown in Table 4, derived from Dixon (2002:215f.).

Table 4. Dixon’s reconstructed paradigms

	see	take, carry	go	hit	get
Root	*nhaang	*kaang	*yan	*pum	*many ⁷
Past	*nhaang-nhu	*kaang-nhu	*yan-nhu	*pum-nhu	*many-nhu
Imperative	*nhaang-ka	*kaang-ka	*yan-ka	*pum-ka	*many-ka
Purposive	*nhaang-ku	*kaang-ku	*yan-ku	*pum-ku	*many-ku

Section 12.2.4 “Evolution of conjugations” (Dixon 1980:411–415) summarizes and exemplifies the kinds of phonological changes across the root-affix boundary that partially led to the loss of the transparent original structure. In this scheme it is claimed to be the Imperative forms that have undergone the most changes, conditioned perhaps because of their pragmatic semantics.

Section 12.2.5 “Development of modern systems” (Dixon 1980:415–421), discusses three processes that affect conjugations. First, a general tendency of languages to eliminate monosyllabic roots is seen behind the reanalysis of disyllabic inflected forms as new roots. The Imperative is a relatively common base for the reanalysis, but other inflections can be involved, as noted by O’Grady for languages of Western Australia. Dixon shows, for example, that Dyirbal *wuka-* “give” corresponds to Nyawaygi *wu-ka* “give-IMPV”, Warrgamay *wuki-* “give” to Nyawaygi *wu-ki* “give-Perfect”, and Warungu *yani-* “go” to Nyawaygi *ya-ni* “go-Perfect”. Second, Australian languages tend to develop systems of two open inflection classes (plus a possible handful of irregular verbs), one of whose members are predominantly transitive and the other largely intransitive. Third, conjugational classes have often merged as the result of a combination of phonological changes and analogical

7. In Dixon (1980) this root was posited as *ma-n; the revision to *-ny was said to be motivated by Alpher et al.’s evidence of *many as the verb’s Past Perfective in Proto-Gunwinyguan (Dixon 2002:222).

changes resulting from the coincidence of some of their inflections. Section 12.2.7, “pA verbal roots in prefixing languages” (Dixon 1980:426–430), points to presumed cognates among the nPN languages of the reconstructed monosyllabic verb roots reconstructed for pA. A few examples are given where the inflectional suffixes correlate with his reconstructed root-final consonants. In Gunwinygu one inflectional class, whose conjugation marker is said to be *ng*, contains the verbs *-na-* “see”, *-ka-* “take/bring/carry”, and *-wo-* “give”, which “are plainly reflexes of pA *NHaa-ŋ*, *gaa-ŋ* and *ŋu-ŋ*” (1980:427). Gunwinygu and Ngandi have *-bu-* “hit” in a conjugation “whose inflections strongly feature an initial *-m*” (1980:429). It is noted that in Mangarayi “there is scarcely any hint of the expected conjugation markers” (1980:428). For other languages mentioned, only the cognate roots are discussed. Lack of this evidence is attributed to the radical changes to word structure that resulted from the development of prefixation. Nevertheless the conclusion is drawn that these languages support the reconstruction made earlier in the book.

The similarity of critical verb roots, and *in most cases* (Mangarayi is unusual), *their conjugation markers* between prefixing and non-prefixing languages is the main evidence that they are related as one Australian language family.

(1980: 428 [emphasis added HK])

Dixon (2002) presents the same views regarding the prehistory of Australian verbs as Dixon (1980), except for the language to which this earlier system is attributed. In Dixon (1980) this state is ascribed to a “Proto-Australian” (pA). Dixon (2002) takes a different stance toward pA. It is totally agnostic regarding the genetic unity of the Australian languages. It rather claims that no high-level proto-languages can be reconstructed at all and that most of the features shared between Australian languages result from diffusion. Dixon’s verbal reconstructions apply to “an earlier stage in the history of the Australian language area” (2002: 215).

2.2 Reactions to Dixon’s reconstructions

Reactions to Dixon’s reconstructions focus on three primary topics: the language stage to which the reconstructions apply; the role of the CMs; and his approach to sound change. Heath (1990:403) challenges Dixon’s labelling of his reconstructions as pA: “from a methodologically conservative point of view, we should really take Dixon’s ‘Proto-Australian’ reconstructions as Proto-Pama-Nyungan, since the descriptive materials used are from the Pama-Nyungan languages”. He then compares Dixon’s reconstructed verbs – roots with their final consonant – to three groups of non-Pama-Nyungan languages from Arnhem Land in northern Australia. He finds that, while “nearly all of Dixon’s core monosyllabic verb stems for Proto-Pama-Nyungan have good cognates in some or all of the non-Pama-Nyungan groups discussed here” (1990:414), the verbs do not group

together in inflectional classes in the way surmised by Dixon, and his conjugation-marking consonants “are difficult to identify in the non-Pama-Nyungan data” (1990:415). Heath does not otherwise question Dixon’s methodology nor dispute his reconstructions as pPN: he only disputes Dixon’s claim that his reconstructed forms represent pA and can be confirmed by the evidence of nPN languages.

Alpher et al. (2003) partially reconstruct the verb suffixes marking Tense Aspect and Mood (TAM) in the nPN Gunwinyguan family of languages in Arnhem Land. Methodologically, they compare inflected roots, and their reconstructions are consequently paradigmatic sets for each of the verbs they compare. They also assign a major role to analogical changes in their reconstructing. In comparing their results with Dixon’s, they conclude that Dixon’s pA CMs cannot be found as final consonants of cognate verbs in Proto-Gunwinyguan but at best correspond to certain consonants occurring in the suffixes marking one or more of the TAM categories. Nor is there a consistent correlation between the consonant of any inflectional category for a class of verbs and the CM of corresponding verbs in PN languages. Some of their reconstructions are given in Table 5. They concur with Alpher’s (1990) alternative view of pPN verbal structure, which is closer to the Gunwinyguan type. They present some comparisons between Proto-Gunwinyguan and particular PN languages, which suggest that “PN ‘conjugation markers’ have origins in the markers of a variety of different verbal categories, which have then been analogically generalized and detached from any association with a particular TAM category” (Alpher et al. 2003:349).⁸

Table 5. Proto Gunwinyguan reconstructions from Alpher et al. (2003:345)

	see	take, carry	get	hit
Root	<i>na-</i>	<i>ka-</i>	<i>ma-</i>	<i>po-/pu-</i>
Past perfective	<i>nay</i> <i>~nang</i>	<i>kang</i> <i>~kanginy</i>	<i>may</i>	<i>pom</i> <i>~pong</i>
Past imperfective	<i>naniny</i>	<i>kaniny</i>	<i>manginy</i>	<i>puniny</i>
Non-past	<i>nan</i>	<i>kan</i>	<i>mang</i>	<i>pun</i>

Green (2003) compares verb paradigms across a wider group of languages from Arnhem Land that includes those compared by Heath and Alpher et al. plus more. She uses the same methods as Alpher et al. She does not compare her results to those of Dixon, but finds that “much of what has been proposed for Proto-Gunwinyguan verbs [by Alpher et al.] is attributable to the parent language of a much wider grouping of languages, which I have called Proto Arnhem” (2003: 419). She reconstructs paradigms for 29 verbs; samples are given in Table 6.

8. Alpher (pers. comm. July 2012), however, wishes to dissociate himself from any extension of findings about Gunwinyguan paradigms to Pama-Nyungan.

Table 6. Proto Arnhem reconstructions from Green (2003: 418ff)

	see	take	get	hit
Past Perfective	<i>nay~nang</i>	<i>kang~kanginy</i>	<i>many~miya</i>	<i>pom~pong</i>
Past Imperfective	<i>nani</i>	<i>kani</i>	<i>mangi</i>	<i>puni</i>
Hab/IrrP	<i>natyan</i>	<i>kanytyan</i>	<i>mangkan</i>	<i>purnta</i>
Non-Past 1	<i>natyini</i>	<i>kanytyini</i>	<i>mani</i>	
Non-Past 2	<i>nan</i>	<i>kan</i>	<i>mang</i>	<i>pun</i>
Irrealis	<i>nayi</i>	<i>kayi</i>	<i>mayi</i>	
Imperative	<i>na</i>		<i>ma</i>	<i>pu</i>

Harvey (2008) discusses the problem of “unassignable segments” in the inflected forms of many PN languages; by this he means phonological “material [that] cannot be straightforwardly assigned to either the root or the tense/aspect/mood suffixes” (2008: 123) – in a synchronic analysis. In opposition to Dixon’s claim that these were originally part of the verb root, he proposes that (2008: 124):

these segments were originally suffixes, and that the combination of these suffixes and the root served as a stem for further suffixation in some parts of the verbal paradigms. In other words, some suffixes were inner suffixes and attached directly to the root. Other suffixes were outer suffixes and attached to stems which consisted of the root and an inner suffix.

Harvey highlights the finding of Alpher et al. that the Past Imperfective is often built on the inflected form which by itself serves as the Non-Past; compare, for example, the Past Imperfective of “see”, *naniny*, to the Non-Past *nan* in Proto-Gunwinyguan. He presents evidence from a number of languages to support a claim that it is typically only inflections that include present time reference which get to be reanalysed as stems for semantically unrelated categories. This does not apply, however, to closed inflectional classes (which he prefers to call sets of irregular verbs rather than conjugations), such as Dixon’s *m*- and *ng*-verbs. The fact that these consonants (*m* and *ng*) do not end up in open class inflections is taken by Harvey as evidence supporting his hypothesis (as well as that of Alpher 1990 and Alpher et al. 2003) that the so-called CMs originate in verbal suffixes rather than in verb roots as posited by Dixon.

The scholar who most seriously questioned Dixon’s methods (as opposed to his results) is Alpher (1990). He presents his own reconstructions of the inflectional paradigms for a number of verb classes. He expresses dissatisfaction with a number of Dixon’s assumptions. His most detailed criticism is applied to Dixon’s postulation of ad hoc sound changes, which are not supported by other forms in the languages. This is based on an “extreme position on the non-regularity of phonological change, which is held to be conditioned by the semantic nature of inflections ... and by the presence

of inflectional morpheme boundaries. This is a position that ... licenses all kinds of mischief” (1990: 167–168). For example, Dixon’s reconstruction of the Imperative of “go” as *yanka requires postulation of sound changes to produce the attested forms *yarra* of Pintupi, *yanta* of Warlpiri, and *yana* of Nyawaygi that fail to apply to the *nk* cluster in other words of the same language, even if there is a morpheme boundary within the cluster. Alpher rather takes a form like Western Desert *yarra* at face value as a reflex of pPN *yarra, which is supported by cognates in other languages, and reconstructs a paradigm that includes suffixes containing both *n* and *rr*.

A sample of Alpher’s tentative reconstructions is given in Table 7. Not all of the forms can necessarily be projected all the way back to pPN. And there is some uncertainty about the semantic value of some of the TAM forms, especially where the evidence seems to support two reconstructions for a given value. Where two Past forms are given, it is sometimes suggested that they were distinguished as Perfective and Imperfective. Notice that each of verbs given here (with the exception of “bite” and “eat”) has a different inflectional pattern⁹ and that there is no consonant that recurs in every cell of the paradigm of a given verb.¹⁰

Table 7. Proto-Pama-Nyungan reconstructions from Alpher (1990)

	bite	eat	go	hit	see	sit
	<i>patya-</i>	<i>nga-</i>	<i>ya-</i>	<i>pu-</i>	<i>nyaa-</i>	<i>nyiina-</i>
Imperative	<i>patyala</i>	<i>ngala</i>	<i>yarra</i>	<i>puma</i>	<i>nyaaya,</i> <i>nyaawa</i>	<i>nyiinaka,</i> <i>nyinaya</i>
Purposive	<i>patyalku</i>	<i>ngalku</i>	<i>yanku</i>	<i>pungku</i>	<i>nyaangku</i>	<i>nyiinaku</i>
Past	<i>patyarnV</i> ¹¹ , <i>patyanma</i>	<i>nga(r)nV</i>	<i>yanV</i>	<i>punyV,</i> <i>pungu?</i>	<i>nyaanya,</i> <i>nyaangu</i>	<i>nyiinanya</i>
Non-past	<i>patyal</i>		<i>yani</i>		<i>nyaama,</i> <i>nyaanyi</i>	<i>nyiinami</i>

3. Methodological issues in verb reconstruction

In this section I discuss issues of method, using Dixon’s work as point of departure. I take it as axiomatic that any linguistic reconstruction must be consistent with what we

9. Another reconstructible verb that inflects like *patya- is *paka- ‘dig, hit’; two other verbs, *ma(a)- ‘get’ and *tyu- ‘put’ have the same pattern as *ya- (p. 160).

10. Bowern (2009), using essentially the same methods as Alpher, similarly reconstructs full paradigms for a sample of verbs in the Yolngu subgroup, and finds for Proto-Yolngu seven different inflectional patterns, each involving a range of consonants.

11. Alpher (2004: 100, Note 8) revises this reconstruction to *patyarn, attributing the variation in final vowels to morphological rather than phonological changes.

know about the processes of language change. This is an application of the uniformitarian principle, which goes back to the Neogrammarians (Hock & Joseph 1996: 154).

3.1 Internal reconstruction vs. comparative reconstruction

Internal reconstruction (IR) is a procedure for gaining information about the structure of earlier stages of a particular language from data found in that language alone. The most discussed procedures deal with phonological material, although it is possible to apply IR principles to reconstruction of morphology, syntax and semantics as well. Phonological IR begins with synchronic phonological alternations (found in allomorphs) and posits for each alternation an earlier phoneme plus a sequence of phonological changes that produce the alternants. It is based on the assumption that the allomorphic differences were caused by sound changes operating on a uniform segment in different environments. The similarity to synchronic morphophonemic techniques that posit an underlying form plus phonological rules (of the type made popular within Generative Phonology) has often been noted by linguists: see, for example, Lass (1977, 1997: 234–237) and Anttila (1989 *passim*).¹²

As mentioned in Section 2.1, Dixon (1980) applied IR to the verb systems of each of Walmajarri, Western Desert, Guugu Yimidhirr, and Nyawaygi before comparing across the languages. Here I illustrate his results for Walmajarri. Dixon's synchronic description of the conjugation system of Walmajarri (Dixon 1980: 385) is summarised in Table 8 (with some change to the order of TAM categories). This description is of the same type as the Yidiny system displayed in Table 3.

Table 8. Walmajarri verb conjugations: synchronic description
(source Dixon 1980: 385)

Class	1(Ø)	2(<i>ng</i>)	3(<i>n</i>)	4(<i>l</i>)	5(<i>rr</i>)
IMPV	Ø	<i>ngka</i>	<i>nta</i>	<i>nytya</i>	<i>rra</i>
FUT	<i>wu</i>	<i>ngku</i>	<i>nku</i>	<i>lku</i>	<i>rrku</i>
PAST	<i>rni</i> ¹³	<i>nya</i>	<i>ni</i>	<i>rni</i>	<i>ni</i>
CUSTomary	<i>lany</i>	<i>ngany</i>	<i>nany</i>	<i>lany</i>	<i>rralany</i>
SUBordinate	<i>rnu</i>	<i>ngu</i>	<i>nu</i>	<i>rnu</i>	<i>nu</i>

12. See Koch (2011b: Appendix 8.1), however, for an indication that solutions according to the methods of Generative Phonology and Internal Reconstruction do not match exactly.

13. Dixon adds a note that the consonant of the PAST and SUB is *ny* after an apical consonant plus *i*. This implies suffixes *-nyi* and *-nyu*. The past of these verbs is however not *-nyi* but *-nya*, with a different vowel.

Dixon then applies IR to the Walmajarri verb system. He implicitly applies a morphemic analysis of the type described above to the system portrayed in Table 8, with invariant underlying forms for verb stems, CMs, and TAM suffixes: “the Walmajarri forms can largely be explained in terms of an originally analytic pattern of this type” [ROOT+CM+INFL] (Dixon 1980:387). He then treats these underlying forms as actual earlier, pre-Walmajarri forms; the rules needed to convert the string of underlying forms into the attested forms are treated as real diachronic phonological changes. He reconstructs a pre-Walmajarri verb system characterized by invariant verb roots, invariant conjugation markers, and a set of invariant TAM inflectional suffixes; that is, a system with no inflectional classes. The results of Dixon’s diachronic analysis of Walmajarri (as discussed in this section of the book) – the underlying forms and the changes they presuppose – are organized and presented in Table 9.

Table 9. Prehistory of Walmajarri verb suffixes proposed by Dixon (1980:385–388)

	y-	ng	n	l	rr
IMPV	(y)ka > Ø	*ngka	*nka > nta	*lka > nytya	*rrka > rra
*PURP>FUT	*ku > wu	*ngku	*nku	*lku	*rrku
CUST	*(y)lany > lany	*nglany > ngany	*nlany > nany	*llany > lany	*rrlany > rralany
PAST	? > rni/nyi	? > nya	*nni > ni	*lni > rni	*rrni > ni
SUB	? > rnu	*ngnu > ngu	*nnu > nu	*lnu > rnu	*rrnu > nu

There are four problems with this solution: (i) it assumes a pre-Walmajarri typology characterized by a uniformity of structure that is unlike that of either modern Walmajarri or a great number of other Australian languages;¹⁴ (ii) it attributes all allomorphy to the result of phonological changes and none to changes of a morphological kind; (iii) it requires phonological changes which are not regular within the language; (iv) it attempts language-particular explanations before considering whether the forms are shared with other languages. I suggest that IR of a morphological kind (positing functional shifts, analogies, reanalyses, etc.) should be used to try to explain only those forms which comparison reveals to be not inherited and explicable by regular phonological changes.

14. Cf. Lass’s (1997:235) comment that the deeper assumption of IR that “earlier states tend to be more uniform than later states ... carried to its extreme ... would mean that at some remove every language has an ancestor with no morphophonemic alternations whatever”. This amounts to an “indefensible claim about the (general) priority of one morphological type ... and is inadmissible on uniformitarian grounds”.

3.2 The regularity of phonological change

Although we are concerned here with morphological reconstruction, the principle of regularity of sound change still needs to be observed, although supplemented with other kinds of change. Hence Dixon's suggested changes such as those affecting his imperatives – *yanka > *yarra*; *ngalka > *nganytya*, *nhaka > *nhawa*, which contradict the normal correspondences in their languages – cannot be accepted as purely phonological changes. Harvey (2008:128) rightly asserted that “regularity must be the default criterion. Any departures from this default criterion must follow from the operation of other principles that are independently motivated. Dixon does not provide any such independently motivated criteria.” Dixon (2002: 222–223) devotes a whole page to countering Alpher's arguments against his use of irregular phonological change. He criticizes Alpher for “operat[ing] from a strict neogrammarian stance, that all sound change must be completely regular” and in particular for not accepting the principle that certain sound changes might occur only across morpheme boundaries (2002:222) or “that imperative might change in a different way to other inflections, because of its pragmatic role in language use” (2002:223). Campbell (1996:78–80) discusses morphologically conditioned sound changes as a secondary principle of language change that interferes with sound change that is essentially regular; the best examples of the phenomenon involve the situation where “languages (or rather speakers of languages) may block otherwise regular sound changes when the result would impede perception of important morphosyntactic functions” (1996:80). It is worth noting that the examples discussed by Campbell do not involve phonological changes that apply only in certain morphological environments, as proposed in Dixon's scenarios.¹⁵

It remains to ask, however, to what extent the special pragmatic status of imperatives can be legitimately invoked to account for the kind of exceptional phonological developments posited by Dixon. Maiden et al. (2009) discuss the kinds of special diachronic effects involving imperatives in the Romance languages. None of their examples involve special sound changes of the type posited by Dixon. Some of their ideas, nevertheless, have a resonance among Australian languages. Firstly, imperative forms sometimes survive, possibly as particles, apart from their paradigm: thus Arrernte *ngke* “give it here!” may be an isolated reflex of an earlier *nyu-ngka “give-IMPV”. Similarly a widespread PN Imperative *wana* “leave” has become a negative particle in a number of languages. Secondly, verbs

15. It must be conceded, however, that another Walmarjarri change mentioned by Dixon, *k* > *w/_+u*, may have applied only in morphemes involving *-ku (Future, Purposive, Dative), as described in Hudson (1978:12), since the sequence *Vku* does occur in other words; e.g. *papaku* “flying fox”, *kayuku* “frilled lizard”.

used in the Imperative may be accompanied by vocative-like enclitics; for example, Arrernte *-aye*. And thirdly, imperatives occasionally serve as the base for remaking a paradigm; for example, *ngala*, originally “eat-IMPV” becomes the inflected stem of “eat” in WD Pintupi/Luritja.

It should be obvious that a reconstruction that does not require the positing of non-regular (and non-recurring) sound changes is preferable to one that does. Such an alternative will require giving up the notion that a single consonant occurred in all the inflectional forms of the paradigm in pPN.

3.3 Local probability constraints

The most plausible and economical reconstructions lead to the kinds of structure that are predominant within the relevant language family; that is, we expect consistency within families unless it has been disturbed by known factors. The principle of reconstruction that follows from this is described by Lass (1997: 275) as the observance of “local probability constraints”: “a protolanguage should have as few properties as possible not attested in at least one of its daughters, or in the general area where we assume it was spoken”. The “two initial assumptions” on which Dixon’s verb reconstructions are based both violate these constraints: that the structure of verbs (as well as nouns) at “an earlier stage¹⁶ ... was basically agglutinative”, consisting of an invariant verb root followed by an invariant TAM suffix with transparent morpheme boundaries, and that many verb roots ended in a consonant (Dixon 2002: 215). This implies that pre-modern stages of language allowed (at the root-suffix boundary) consonant clusters of the type nowhere permitted in the attested Australian languages. This typology is rarely found in the structure of PN verb inflection and is totally lacking in the nPN languages of Arnhem Land, which are widely considered to be among the closest relatives of the PN family. These languages fail to show a pattern where a single consonant is found throughout the inflectional paradigm, nor is there any reason to assume that earlier linguistic stages ever manifested such consistency – a point already made in Alpher (2005: 797–798). In other words, the “irregularity” needs to be reconstructed to the proto-language.

3.4 Comparison of whole words before internal analysis

Comparative reconstruction should proceed from the comparison of whole words rather than single disembodied morphemes. “Reconstructing from full

16. In Dixon (2002) the reconstructions are not claimed to apply to a Proto-Australian, which he no longer advocates, but only to “an earlier stage in the history of the Australian language area” (2002: 215).

tense-forms ... is not just a formal nicety. Reconstructing endings alone, disembodied from stems, gives no confidence that the result is in fact a proto-paradigm" (Alpher 1990: 167). In fact, comparative reconstruction does not require prior morphological analysis of the words compared. Sets of inflectionally related words can be reconstructed by comparing across languages; then normal synchronic linguistic analysis is performed on the set of proto-words to yield their internal structure. This is what Anttila (1989: 351) means by the claim that "comparative morphology is simply applied phonology".¹⁷ Reconstruction of complex words that occur in paradigmatic sets, however, is complicated by the fact that particular forms may have been affected by non-phonological changes: analogically motivated levellings within paradigms and extensions from other inflectional classes (Koch 1996: 219, and see below).

Stems with their affixes have been taken as the object of comparison in the practice of Alpher (1990), Alpher et al. (2003), and Green (2003). Dixon (1980), on the other hand, largely operates in terms of sets of suffixes that occur together in particular conjugations and comparison of verb roots with their CM. Note that the consonant that is posited as the CM in the individual languages is selected on the basis of its predominance in the suffixes of the verbs of its class. For example, in Walmajarri "see" is given as *nya-ng* because *ng* occurs in four of the five inflections, and "eat" is given as *nga-l* because *l* occurs in two of the five inflections (as does *rn*!). In the comparative reconstruction stage of his presentation, the particular root-final consonant that is reconstructed is selected by taking the CM that occurs in the majority of the languages that have inflectional classes, resulting in **kaa-ng* "carry", **maa-n* "get", **ya-n* "go", **nga-l* "eat", etc. Thus the reconstructed verb forms of Proto-Australian (or earliest Australian in the perspective of Dixon 2002) represent the combination of the reconstructed root with the consonant that occurs in the majority of its inflections in the majority of languages, followed by the supposed invariant suffixes. These posited original forms are not "reconstructions" of the kind produced by the classical Comparative Method, which produces proto-words by comparing across languages, then applies morphological analysis to these proto-words.

3.5 Exploiting known kinds of morphological change

It is axiomatic that morphological reconstruction needs to be based on the known principles of morphological change. The kinds of change that are expected to affect

17. Cf. Campbell (2004: 302): "The techniques used for lexical reconstruction ... based on the sequence of sound correspondences in cognate words, can frequently be used to reconstruct polymorphemic words. Morphological analysis of these reconstructed proto-words provides the proto-morphology free, so to speak".

morphological systems should be invoked, alongside the regular phonological changes that apply in the particular language. The morphological changes should especially be used to account for forms that are not strictly cognate according to the established phonological correspondences. A typology of morphological change is given in Koch (1996); see also Koch (2011a) for a short summary organized along different lines. Some of the kinds of change and their implications for reconstruction are given in the following sections.

3.5.1 *Functional shift*

Inflectional formatives, like lexemes, are liable to undergo semantic shifts. This has the consequence for comparative linguistics that cognate formatives are not always found in the same functional slot in related languages (Koch 2003).¹⁸ For example, it has often been noted that inflections in *-ku* are found as markers of either Purposive or Future; the earlier use has been Purposive, since this usage is very close to that of the nominal Dative case, which is also expressed by *-ku*. A further change beyond the shift of Purposive to Future has been established for a number of Pilbara languages (Panyjima, Ngarluma, and Yindjibarndi-Kurrama) by Dench (2003), who shows that the Future has further shifted to Present tense, presumably via a Prospective aspect meaning, which is attested in Nyamal. Functional shifts have been taken account of by Australian comparativists (Dixon, Alpher, Alpher et al., Green), in that they have compared forms whose functions are not exactly equivalent. I suggest that invoking functional shift would solve the problem of the Imperative *-nytya* of *l*-class verbs in Walmajarri (and other Ngumpin-Yapa languages), which Dixon (1980:386) derived from **-lka* by problematic sound changes. This formative has a plausible etymon in the widespread Pama-Nyungan nominalising suffix *-nhtha* (which is reflected as *-nytya* in the Ngumpin-Yapa languages), provided we assume a functional shift of nominalization (infinitive) to imperative. Such a change presumably accounts for an Arandic particle, Kaytetye *mentye* and Anmatyerr *ipmenty/imenty/menty* “leave it”, “don’t worry about it”, “never mind”, which is plausibly related etymologically to the North-eastern Arrernte verb *ipme-* “leave something behind, leave it alone, let go of something, abandon it”.¹⁹

18. An example from verbal inflection involved the comparison of the Arrernte Potential inflection with the reconstructed Kaytetye Present **-me* (Koch 2003:278).

19. A possible extra-Arandic cognate is *kima-* “let go, leave” in the Warluwarric languages (Carew 1993:66).

3.5.2 *Reanalysis of wordforms*

A common type of morphological (and syntactic) change is reanalysis, whereby a form comes to have a different structural analysis without the surface manifestation being changed (Harris & Campbell 1995: 50); typically, new forms based on the reanalysed structure are the main evidence that reanalysis has taken place.

Dixon has shown that this is one of the ways conjugations are transformed in Australian languages, referring to “the recurrent reanalysis of verbs; for example, taking an old monosyllabic-root plus suffix as a new disyllabic root, to which suffixes are added all over again” (Dixon 2002: 210). The repeated operation of these reanalyses has resulted in the elimination of monosyllabic stems in many languages: “many modern polysyllabic roots go back to a pA monosyllable” (Dixon 1980: 403).

A number of reasons can be given for such reanalyses. Dixon (e.g. 2002: 224) emphasizes changing phonotactic targets that eliminate monosyllabic stems. Koch (1995: 60–64) highlights the potential for Imperative forms to be reanalysed as having a zero inflection, with the erstwhile suffix being absorbed into the stem. Harvey (2008) emphasizes that (in open classes at least) it is especially forms that express the (semantically most neutral) Present tense that usually form the base for further inflections, unless the new inflection is semantically related to the base. An example of the latter is Walmajarri, where the Irrealis Mood inflection consists of suffixing *-rla* to the semantically related Imperative, which also has modal usages. The use of the Future suffix as a stem in the Western Desert language was mentioned in Section 1.

Reanalyses of this type have implications for comparison and reconstruction. They indicate that, especially for monosyllabic verb roots, one should be prepared to accept disyllabic verb stems as potentially cognate with particular inflected forms of a paradigm in languages that inflect monosyllabic verb stems.²⁰ Thus, even languages that have not retained the monosyllabic root will have preserved evidence (in their stem) for at least one inflectional affix.

Sometimes a language has two or more stems that derive from earlier inflections. Thus the Pintupi/Luritja dialects of the Western Desert language have two stems for “eat”: *ngala-* (Ø conjugation) and *ngalku-* (*la* conjugation). Comparison with other languages, such as Nyangumarta, shows that these two stems originated as Imperative and Purposive inflections of a monosyllabic verb root, which followed Alpher’s *rn/l*-inflection, a pattern that no longer exists in the language.

20. Koch (2009) explicitly formulates the strategy of comparing inflected forms with stems that have historically absorbed an earlier inflectional form.

Dench (1998: 95–97, with references to earlier findings of O’Grady) shows that many languages of the Pilbara region of Western Australia reflect the PN monosyllabic verb roots as disyllabic stems, having absorbed different erstwhile inflectional formatives by processes of reanalysis. Closely related languages have sometimes built their new stem on different inflections. Some languages base the new stem on the former Purposive suffix, and others on the Past. Thus we find cognate stems *yanku-* and *yana-* for “go”, *manku-* and *mana-* for “get”, *yungku-* and *yinya-* (< **yunya*) for “give”, *nhaku-* and *nhanha-* for “see”, and *ngarrku-* (< **ngalku*) and *ngarna-* for “eat”. The consequence for reconstruction is that, while any language that shows a single disyllabic stem for an earlier monosyllabic verb root provides evidence for only one earlier inflection, comparison across these languages yields at least two earlier inflections of a former monosyllabic verb stem.

Another subgroup that has totally eliminated monosyllabic verb roots is the Thura-Yura subgroup of South Australia. In most cases the new verb stem includes the erstwhile Purposive suffix. Thus, Simpson and Hercus (2004: Appendix 8.2) give the following reconstructions within the subgroup: **manku-* “take/get”, **ngalku-* “eat”, **nhaku-* “see”, **pungku-* “kill” (< **hit*). **yungku-* (< **nyu-*) “give”. On the other hand “lead/bring” **kangka-* seems to be built rather on the former Imperative. And “see” seems to show alternative stems *nhanga-* in Kurna and *nhaka-* in Wirangu, which reflect different inflections in an earlier linguistic system. For Kurna Amery (2000: 80) quotes an early record *poomandi* “to strike”, which attests to an alternative stem *puma-* (beside *pungka-*) for “hit”. These alternative stems suggest that more than one of the original monosyllabic inflections persisted beyond proto-Thura-Yura.

A number of languages, especially in south-eastern Australia, have one main pattern of inflection for most verbs but a number of (typically monosyllabic) verbs have irregular inflections. In some cases verbs participate in more than one inflectional system, one of which applies regular inflections to a disyllabic stem, while others reflect inflections of an earlier monosyllabic stem. Thus in Gadhang for “hit” the Imperative and Nominaliser are based on a root *pu-*, while other inflections use the regular suffixes added to a stem *punyi-*. The verb “see” likewise has irregular inflections (Imperative, Purposive and Nominaliser) based on *nyaa-* but regular ones using a stem *nyaanyi-*. For “get” a monosyllabic root is apparent in Purposive *maanki* and three separate Imperative forms *marra*, *maana*, and *maaka*, and there are regular forms built on both *maanyi-* (Past *maanyila*, Future *maanyiyi*) and *marra-* (Past *marrala*), which seems to be the Imperative. The implied paradigms of “hit” and “see” are shown in Table 10.²¹

21. These forms are taken from Lissarrague (2010). Most of the forms are from p. 74, but some are taken from the texts. The *n* in the Imperative and Purposive of *maa-* represent my different interpretation of the sources from Lissarrague’s *nh* and *ny* respectively.

Table 10. Gadhang verb paradigms from Lissarrague (2010)

	hit	hit	see	see
stem	<i>pu-</i>	<i>punyi-</i>	<i>nyaa-</i>	<i>nyaanyi-</i>
IMPV	<i>pungka</i>		<i>nyaaka,</i> <i>nyaa</i>	
PURP			<i>nyaaki</i>	
NOMLSR	<i>pungkil</i>		<i>nyaakil</i>	<i>nyaanyil</i>
PAST		<i>punyla</i>	<i>nyaala</i>	<i>nyaanyila</i>
FUT		<i>puniyi</i>		<i>nyaanyiy</i>

3.5.3 Analogical changes

Analogical change is basically the creation of novel forms on the model of another (usually more prevalent) pattern found in the same language. Analogy is the second great principle of language change (beside the regularity of sound change) emphasized by the Neogrammarians (Osthoff & Brugmann [1878]/1967). Not all linguistic change can be explained by sound change, especially if one insists on regularity. It was widely accepted among the Neogrammarians that many forms, especially within inflectional paradigms, have been created by processes of a morphological rather than a phonological nature, for which the Neogrammarians gave the term “analogy”.²²

One of the most discussed of such changes is “levelling”, where forms (such as allomorphs of the stem) are extended from one or more cells to all members of a paradigm, thereby producing greater uniformity within the paradigm. It has not proved possible to provide principles that adequately explain which form is most likely to prevail in paradigmatic levelling; some factors are indicated in Koch (1996: 232). Garrett (2008) argues that the direction of levelling is not to be sought in universal principles (such as markedness): in fact “pure levelling does not exist and ... the emergence of paradigm uniformity is always the imposition of an existing (uniform) pattern on a non-uniform paradigm” (2008: 142). This would make levelling a special case of extension.

However it is to be motivated, paradigm regularization is surely one of the mechanisms, along with reanalysis of word forms, that accounts for the appearance of *n* in the whole paradigm, including the Imperative, of **ya-* “go” in many

22. See Anttila (1989: Chapter 5) and Hock and Joseph (1996: Chapter 5) on analogical change in general.

PN languages. This includes replacing the inherited Imperative *yarra, which Alpher (1990) reconstructed for this verb.²³

Another kind of analogical change involves the influence of one inflectional class on another. It is well known that major, productive inflectional patterns may attract into their class lexical members of minor, unproductive classes. Thus, over time many English strong verbs have taken on the inflection of the majority weak class; for example, replacing a past tense form like *drug* by *dragged*. The influence of major on minor classes may also lead to the replacement or reshaping of inflections. Thus in Latin fifth-declension nouns (mostly feminines with stem in *ē-*) were affected by those of the productive first declension (mostly feminines with stem in *ā-*), and fourth-declension nouns were heavily influenced by the productive second class, with which they shared largely masculine gender and some of whose inflections became identical as a result of sound changes (*-os* > *-us*, *-om* > *-um*). Latin noun inflection also shows that parallel open classes influence one another. Thus the first-declension Genitive Singular suffix *-āī* (later *-ae*), replacing *-ās* (as in the relic phrase *pater familias* “father of the family”), was modelled on the *-ī* of the second declension; conversely the Genitive Plural *-āsōm* (> *-ārum*) of the first declension was the model for a reshaping of the second declension’s exponent from *-um* to *-ōrum*.

Analogical change has been used to some extent in Australian linguistic reconstruction. Dixon has noted the attraction of members of minor verbal conjugations into productive classes, with the consequent reduction or elimination of minor classes; changes in minor class membership (such as *pu- changing from *m-* to *ng-* class; and the merger of *ng* and *m*-classes in some languages (1980:404). Alpher (1990:169) has suggested that certain classes have “acquired [some of their inflections] analogically from other paradigms”. I suggest that linguistic reconstruction should make greater use of analogical explanations, explaining the reshaping of inflectional forms of one class under the influence of other classes (see on Walmajarri below). Such changes can be described in terms of “proportional” or “four-part” analogy of the type utilized by historical linguists since the Neogrammarians (see Hock & Joseph 1996:160). For example a novel Purposive form *-rrku* beside an Imperative *-rra* may have been modelled on the relationship between *-la* and *-lku*, which is expressible by the formula *la : lku = rra : rrku* (to be read as “*la* is to *lku* as *rra* is to *rrku*”, where *rrku* is the novel form), in the Ngumpin languages (cf. Walmajarri class 5(*rr*) in Table 8) – assuming an earlier inflection *-la* was present in the system.

23. This principle answers Dixon’s (2002:223) objection to Alpher’s reconstruction of *yarra, that he “pays no attention to explaining [Imperative] forms such as *yana*, *yanta* ... Or to explaining the new disyllabic roots that have been assigned to ‘go’ in about fifty further languages”.

3.6 The value of shared irregularities

It was probably Meillet ([1954]/1967) who best articulated the implications for reconstruction that can be derived from the principle of analogical change. If a form is regular within the system of its own language it can be the result of analogical changes; hence, it has little value for reconstruction. On the other hand, if a form is exceptional (anomalous, or aberrant) within its own linguistic system, it may be explicable only in terms of an earlier system. If it resembles similar anomalies in other languages, it should be reconstructed to an earlier state. Thus, in doing reconstruction one should value the synchronically irregular and unmotivated forms over the well-behaved forms if they have comparative support. The synchronically regular forms should be explained, by internal reconstruction within the particular languages, as the result of regularising morphological changes – which may be parallel in a number of languages. This will be illustrated in the following section with respect to heterogeneous verbal paradigms in the Pama-Nyungan languages.

Hetzron's (1976) "principle of archaic heterogeneity" is an application of these principles. In the example quoted in Koch (1996:219f), where the 1Sg and 2SgMasc verbal inflections are *-ku* and *-ta* respectively in Akkadian but *-tu* and *-ta* in Arabic and *-ku* and *-ka* in Ethiopic, the most heterogeneous system of Akkadian is taken to reflect the Proto-Semitic pattern since the more homogeneous ones found in the other two languages can be assumed to have resulted from language-particular levellings. The verbal paradigms in many Australian languages are heterogeneous, whereas individual languages show more homogeneous patterns. Hetzron's principle encourages us, in comparing heterogeneous vs. homogeneous paradigms of cognate verbs, to take seriously the possibility that the non-uniform pattern may reflect the original structure, while the uniform pattern is the result of regularising analogical changes. This is more consistent with Alpher's approach to pPN verbal reconstruction than with Dixon's, which assumes consistent patterns as the starting point.

One kind of irregularity that is valued in grammatical reconstruction is relics or archaisms. These are exceptional forms or patterns that are explicable as survivals from and vestiges of an earlier linguistic system. While they may be difficult to interpret historically on their own, they are valuable as additional support for reconstructions made on the basis of other evidence (see Campbell 2004: 303–305). Thus while the Ngumpin languages have *nganytya* as the imperative of *nga-* "eat" instead of the form **nga-la*, which is reconstructible from other languages, a trace of the expected form is discernible in the Walmajarri Customary form *ngalany*, which appears to consist of the suffixation of *-ny* to this **ngala* (see Section 4.1).

3.7 Distribution across subgroups

For the sake of completeness, it should be mentioned that in any kind of comparative reconstruction, the distribution of cognate forms must be sufficiently wide across major subgroups that they cannot be taken to be reflexes of a lower-order proto-language. Where the higher-level branches are not yet established (as in Pama-Nyungan), a geographic breadth of attestation is required to inspire confidence that what is reconstructed was a feature of the proto-language.

4. Exemplification

In this section I illustrate how the aforementioned principles can be applied in a few particular instances where Dixon’s methods and results have been contested, to explore whether alternative reconstructions can be posited which adhere to the methodological desiderata outlined above. Section 4.1 revisits the prehistory of the Walmajarri inflectional system, and Section 4.2 discusses three instances of shared paradigm irregularities.

4.1 Internal reconstruction of Walmajarri verb inflection

The study in this section is an exercise largely in internal reconstruction of a morphological kind. This can be contrasted with Dixon’s reconstructions, which were given in Table 9. The Walmajarri verb suffixes, presented earlier in Table 8, are set out in Table 11 with a slightly different organization. Note that I have given two classes corresponding to Dixon’s class 1(Ø), which has two different PAST and SUB inflections: my class 1b thus agrees inflectionally with class 1a in its IMPV and FUT, with class 3 in PAST, SUB, and with both 1a and 3 in CUST. Note also that classes 4 and 5 agree in PAST and SUB. The second line of the table includes the number of verb stems in each class.

Table 11. Walmajarri verb suffixes re-arranged

Class	2(<i>ng</i>)	1b(Ø)	1a(Ø)	4(<i>l</i>)	3(<i>n</i>)	5(<i>rr</i>)
no.	6	8?	17?	2	3	9
IMPV	<i>ngka</i>	Ø	Ø	<i>nytya</i>	<i>nta</i>	<i>rra</i>
FUT	<i>ngku</i>	<i>wu</i>	<i>wu</i>	<i>lku</i>	<i>nku</i>	<i>rrku</i>
CUSTomary	<i>ngany</i>	<i>lany</i>	<i>lany</i>	<i>lany</i>	<i>nany</i>	<i>rralany</i>
PAST	<i>nya</i>	<i>nya</i>	<i>rni</i>	<i>rni</i>	<i>ni</i>	<i>ni</i>
SUBordinate	<i>ngu</i>	<i>nyu</i>	<i>rnu</i>	<i>rnu</i>	<i>nu</i>	<i>nu</i>

As noted earlier, Dixon applied to these forms the method of phonological IR, positing invariant stems and suffixes and the operation of irregular sound changes. In the first instance, the Walmajarri inflections should be compared to those of the other languages in the Ngumpin subgroup. Most of the forms have very close cognates in its sister languages, and so can easily be reconstructed to Proto-Ngumpin. For some categories a slightly different semantics is suggested: the Future is likely to have had a Purposive value and the Subordinate is clearly a nominalized form. The comparative evidence suggests that Ø may not have been the only exponent of Imperative in the Ø class (suffixes *-ya* and *-wa* are also attested). There is further a comparable aspectual stem that is found in Walmajarri, Jaru, and Gurindji, and labelled Repetitive, Continuative and Imperfective respectively. This stem consists of the consonant of the Past followed by the vowel *a*, and takes further Tense and Mood inflections of the *n*-class, including an otherwise non-occurring suffix *-na* which supplies the Present tense of this aspect. Internal reconstruction applied to Proto-Ngumpin suggests that it originated as a phrase consisting of the non-finite *u*-form (the Subordinate of Walmajarri) followed by the verb *ya*- “go”, which belongs to the *n*-class; the Past Imperfective for “carry”, for example, would have evolved from **kangu yani* to *kangani*. The loss of a consonant and subsequent elision of a vowel in compounds of this type is common in Australian languages: e.g. in Warlpiri compound verbs in **-ntya-ya-ni* (where *-ya-* was the verb “go” and *-ni* its Non-past tense) evolved into the inceptive suffix *-ntyi-ni* (Simpson 2001: 184). The suggested Walmajarri development accounts for the formation’s aspectual semantics (originally “go along VERBing”) and its *n*-class inflections. This scenario, however, presupposes an earlier Present inflection **ya-na*, which would then be preserved in the aspectual stem of these languages as a relic. This reconstruction is confirmed by the fact that Gurindji and Bilinarra have a Present *yana* and Mudburra a “General” Tense *yana*.

This suggests that a category of Present may be reconstructible for other verbs as well. For the *n*-class verb “take” a form *mana* is attested in Bilinarra. For the *l*-class verbs *nga*- “eat” and *ma*- “say”, cognates from the same languages that yield **yana*, justify the reconstruction of **ngala* and **mala*. For “carry” Bilinarra has *kanga*. Walmajarri lacks such forms (except for its possible trace in *-na*, the Present of the Repetitive Aspect). However, its Customary is otherwise without parallels. It seems plausible that Walmajarri has created its Customary Aspect by appending a consonant *ny* to this inherited Present Tense inflection of monosyllabic verbs (these are the only verbs for which there is comparative evidence for this Present tense inflection).²⁴

24. Some other Ngumpin languages, e.g. Bilinarra and Ngarinyman, have related forms with optional *-ny* (Patrick McConvell, pers. comm. 21.09.2011); so the creation of forms in *-nany*, for example, may have been in a pre-Walmajarri stage.

This accounts for the Customary *-nany*, *-ngany*, and *-lany* in class 4 (assuming earlier forms **ngala* and **mala*. We can posit that *-lany* was extended to class 1a because the inflections of this class partially overlapped with those of class 4, and then to class 1b, with which class 1a shares several inflections. The Customary form of class 5, *-rralany*, appears to consist of this same *-lany* added to the Imperative suffix *-rra*. I propose that its source is in the major classes 1a and 1b and that this is an instance of the influence of the most productive inflectional class on other classes.²⁵

4.2 Comparative reconstruction of Pama-Nyungan heterogeneous paradigms

This section is an exercise in comparative reconstruction of inflectional morphology. I show that there is widespread comparative evidence among the PN languages in support of reconstructing verbal paradigms that include two or more dissimilar consonants among their inflections; I call these “heterogeneous paradigms”. This continues and expands the approach pioneered by Alpher (1990), who reconstructed paradigms that involved *l/rn* (**patha*- “bite” and **nga*- “eat”),²⁶ *n/rr* (see below) and *m/ny/ng* (**pu*- “hit”), among others. I examine three heterogeneous patterns: *n/rr*, *ng/w*, and the exceptional properties of **nhaa*- “see”. There are two reasons for concentrating on these minor inflectional classes. First, a greater proportion of cognates can be found in these classes than in the more regular classes. The relevant verbs are semantically rather basic and therefore of high frequency of use. Second, as implied in Section 3.6, the regular inflectional classes, because of their productivity, attract into their class both new lexical verbs and verbs from more minor classes. Therefore the fact that a particular verb inflects according to such a pattern is more likely to be the result of a morphological change than is the case for the members of minor classes. Thus Indo-Europeanists have been more successful in reconstructing the paradigm of so-called “athematic verbs” (such as **es*- “be” and **ei*- “go”), a class (or set of classes) which is moribund in all the classical Indo-European languages, than in sorting out the origins of the much more productive “thematic” inflectional types.²⁷

25. This internal reconstruction of the Walmarjarri Customary differs somewhat from that given in Koch (1996:255), which was done without the benefit of the evidence from the other languages about a possible proto Present tense form in *-Ca*, and which wrongly gave the class 1b form as *-ngany*.

26. This root is lacking in much of eastern Australia, where “eat” is rather **tha*-.

27. This is true despite some uncertainties about the morphophonemic alternations involved in the paradigm, for which see Koch (2000).

4.2.1 Paradigms with *n/rr*

Three PN verbs were assigned by Dixon to the *n*-conjugation, and reconstructed by Alpher (1990) with inflectional suffixes containing both *n* and *rr*: *ya*- “go”, *ma(a)*- “get”, *thu-/tyu* “put”. These verbs characteristically have some inflections that include the consonant *n* beside at least one inflection containing the tap/trill *rr*. Dixon noted the Western Desert Imperatives in *-rra* for this class and the aberrant Imperative *maa-rraa* in Guugu Yimidhirr (where the long vowel of the suffix is not explained). However, as discussed above, Dixon derives the Imperative *rr*-forms from an earlier sequence *nka* (a presumed conjugation marker *n* followed by an invariant suffix *-ka*) via changes of a phonological nature.²⁸

The Western Desert language has for all three verb roots inflections *-na*-, *-ni*-, *-nu*-, *-nku* but an Imperative suffix *-rra*. Similar inflections are found in the Marrngu subgroup of Western Australia. On the other hand, the Ngumpin-Yapa subgroup of northern Western Australia (which includes Walmajarri discussed above) has for the Imperative not **yarra*, **marra*, **tyurra* but *yanta* and *manta* (the *tyu*- root is absent). There are no forms with *rr* in the inflectional paradigm of these monosyllabic roots, but another conjugation (class 5(*rr*) in Table 11) involves both *rr* and *n*. We note that the *rra*-forms of the Western Desert and Marrngu languages are aberrant or anomalous within their paradigm. This kind of aberrancy recurs in other languages in even more dramatic form.

Consider the Yolngu languages of northern Australia, represented by Ritharngu. The verb “get” has a disyllabic verb root *maarra*-, which was presumably built on an earlier inflected form **maa-rra*.²⁹ There is a Past tense form *maarra-nha* (Heath 1980:69). Beside this regular inflection, however, there is also an anomalous Past tense inflection *maana*. This is the only inflected form not based on the root *maarra*-. The *n* is synchronically inexplicable. Assuming that the stem *maarra*- results from the reanalysis of one or more inflections consisting of or containing *rra*, we can internally reconstruct an earlier partial paradigm consisting of a monosyllabic root *maa*- with inflected forms *maana* and *maarra*(-). A second irregular verb, the compounding thematising form *-dyu*-, which is obviously cognate with Western Desert *tyu*- “put”, shares these inflectional irregularities with “get” (Heath 1980:65). It has two inflections with *n* and two containing *rr* (see Table 12).

28. O’Grady (1990) likewise treated *yarra* vs. *yanta* as a matter of irregular phonological change, but reconstructed **yarra* and assumed a change *rr > nt* in Warlpiri.

29. I follow Dixon (1980:403–405) in positing a long vowel in this root and that of **nhaa*- (Section 5.2.3), while leaving open the possibility that vowel length may need to be revised when all the cognates are considered, since my focus here is on the inflectional suffixes.

Table 12. Ritharrngu irregular verbs in *n/rr*

	stem	PRES	PAST	PAST.POT	FUT
“get”	<i>maa-</i>		<i>*maa na</i>	<i>*maa rra</i>	
THEMsr	<i>-dyu-</i>	<i>dyu n</i>	<i>dyu na</i>	<i>dyu rra</i>	<i>dyu rru</i>

Next consider a couple of languages from eastern Australia. Gumbaynggirr and Yaygirr are two closely related languages of north-eastern New South Wales. Here we find that three of the six irregular verbs are *ya-* “go”, *maa-* “get”, *tyu-* “tell” (note the different meaning of *tyu-*). These verbs are irregular in that they have inflected forms based on a number of different disyllabic stems as well as a few forms apparently based on a monosyllabic stem, as shown in Table 13. The disyllabic stems involve both the consonants *n* (*na*, *ni*) and *rr* (*rraa*). The inflectional suffixes added to disyllabic stems are regular.

Table 13. Gumbaynggirr irregular verbs in *n/rr*

	stem	PRES	PAST	IMPV	PURP/FUT
take	<i>maana-</i>			<i>maana</i>	<i>maanayku</i>
	<i>maani-</i>		<i>maanng</i>	<i>maani</i>	<i>maaniku</i>
	<i>maa-</i>	<i>maanytyi</i>			<i>maanku</i>
go	<i>yana-</i>			<i>yanaa</i>	<i>yanayku</i>
	<i>yani-</i>				<i>yaniku</i>
	<i>yarraa-</i>		<i>yarraang</i>		
	<i>yaa-</i>	<i>yaanytyi</i>			<i>yaanku</i>
say	<i>tyuna-</i>			<i>tyunaa</i>	
	<i>tyurraa-</i>		<i>tyurraang</i>		
	<i>tyuu-</i>	<i>tyuunytyi</i>			<i>tyuunku</i>

This variability of inflectional stems suggests an earlier heterogeneous paradigm containing inflections *-na*, *-ni*, *-nku*, plus *-rra* (or *-rraa*). Further evidence for **yarra(a)* comes from the sister language Yaygirr, where the stem of “go” is the disyllabic *yarra-*. The reconstructed system is shown in Table 14.

For languages that reflect pPN **yarra*, Alpher cited three languages from the west (Western Desert (Pintupi), Nyangumarta, and Watjarri) plus two languages from the north-east (Yirr-Yoront and Kuuk-Thayorre). The Guugu Yimidhirr *maarraa* mentioned by Dixon is also from the north-east. To these we can add Ritharrngu from the isolated Yolngu subgroup in the north and Gumbaynggirr and Yaygirr from the south-east. Further examples could be cited: an Imperative *marra* occurs in the Kuri subgroup from coastal New South Wales (in Gadhang

Table 14. Reconstructed pre-Gumbaynggirr-Yaygirr irregular verbs in *n/rr*

	stem	?	PRES	?	?	PURP/FUT
take	<i>maa-</i>	<i>rra</i> (Yaygirr)	<i>nytyi</i>	<i>ni</i>	<i>na</i>	<i>nku</i>
go	<i>ya-</i>	<i>rraa</i>	<i>nytyi</i>	<i>ni</i>	<i>naa</i>	<i>nku</i>
say	<i>tyuu-</i>	<i>rraa</i>	<i>nytyi</i>		<i>naa</i>	<i>nku</i>

and Darkinyung). Some of the poorly documented Yuin languages of south-eastern NSW (Ngunawal, Ngarigu) have a verb stem *yarrapa-* (or *yarrapi-*, where the *i* may be an imperative inflection) “go”, beside stems in *yan-*: cf. Ngarigu *yarrapi* “go” and *yarrapi-nyili* “come” vs. Omeo (a dialect closely related to Ngarigu) *yanityi* “go” and *yani-nyili* “come” – all recorded in 1844 (Robinson 2000: 191, 200). I assume that the *yarra-* part of the stem reflects the earlier imperative inflection, which was reanalysed as part of the stem, and then further extended. For “get” in the Omeo dialect there are similarly stems *marra-*, *mani-* and *manka-*, which presumably have a similar historical explanation. A further subgroup that shows traces of an *n/rr* paradigm is Karnic, from the South Australia and Queensland border area. Although the Karnic languages lack verb conjugations, comparison of alternative disyllabic stems betrays the earlier presence of an *n/rr* class of monosyllabic verbs. A reflex of the *rr*-inflection of **maa-* is found in Pitta-Pitta *marrh-i* “get”, while *n* appears in Wangkangurru *mani-* “take” and its combining form *manta-*, and in Diyari *mandrra-* (< **manta-*) “grasp”. That this is not an isolated item is shown by the presence of other similar sets; e.g. Wangkangurru *kudni-* (< **kuni*) “put down” vs. Diyari *kurrha-* “put down” and Pitta-Pitta *kurrhala-* “drop”; Wangkangurru *widni-* (< **wini-*) “go down” vs. Diyari *wirrho-* “enter”.

Dixon (2002: 223) objects to Alpher’s reconstruction of **yarra* on the grounds that this reconstruction is only supported by five of the thirty-some languages containing a monosyllabic root *ya-*. We have extended the number and geographical distribution of its reflexes, however. Nevertheless the basis for reconstructing **yarra* and **maarra* is not only the number of cognates and their wide and discontinuous distribution, but that fact that their inflectional irregularity is more plausibly explained by common inheritance from a heterogeneous paradigm than by other means such as irregular sound change or borrowing. On the other hand, the fact (noted by Dixon) that so many languages have Imperative forms containing an *n* can be readily accounted for by processes such as the reanalysis of *n*-suffixes as part of the stem, paradigm regularization, and the creation of new zero-marked Imperative inflections according to the dominant paradigms.

4.2.2 Paradigms with *ng/w*

Dixon (1980: 403–404, 2002: 216) posits an *ng*-class which includes the following monosyllabic verb roots: *kaa- “carry”, *nhu- (in the West, *wu- in the East) “give”, *ru- “cry”, *nhaa- “see”. Another verb, *pu- “hit”, which is assigned to the *m*-class, inflects according to the *ng*-class in many languages. He notes that the “*ng/m* contrast has been neutralised in most modern languages” by class merger (Dixon 1980: 422). The original verb roots are assumed to have ended in *ng* and the Imperative and Purposive inflections to have been invariant *-ka and *-ku respectively. Now the attested Imperatives of the four languages he discusses are as follows: Walmajarri has *kangka*, etc. (with an exception for *nya*- “see” discussed below), Western Desert has *kawa* etc. Nyawaygi has *nyaaka* and *wuka* for “see” and “give” respectively, and Guugu Yimidhirr has *nhaawaa* and *wuwaa* (with an unexplained long vowel) for “see” and “give” respectively. These three kinds of formation, with *-ngk-*, *-k-*, and *-w-*, are all interpreted as resulting from an original *-ng-ka, via phonological changes. As noted earlier, such sound changes are not the regular developments expected in these languages.

I believe there is comparative evidence for reconstructing a paradigm that contained inflections with both *ng* and *w*, and also *k* in at least the case of *nhaa- “see”. In other words, the *w* in *-wa* is a genuine inheritance rather than the result of a sound change, and *-ka* without *ng* was the proto-form of the Imperative suffix for *nhaa-. There is thus no need to resort to exceptional phonological sound changes.

Alpher (1990: 163) in fact reconstructed an Imperative *nyaawa of “see” for pPN on the basis of the cognate forms in Western Desert and Guugu Yimidhirr. Further evidence for an inflection *-wa* comes from Nyangumarta (in the Marngu subgroup of Western Australia), which has Imperatives *ka-wa* “carry” and *yu-wa* “give”, beside Potential (< Purposive) with suffix *-ngku*. Ritharrngu, in the Yolngu subgroup in Arnhem Land, for “carry” and “see” has inflections *gaawa* and *nhaawa* with the value of Past Potential, meaning “should/would have”. There is no separate Imperative form, the Future being used for commands. The *-wa* inflections contrast with Future inflections (from the inherited Purposive) *gaangu* and *nhaangu* respectively that reflect *-ngku by regular sound change. These forms show that *-w-* cannot be the regular reflex of *-ngk-.

Alpher (1990: 163) cites a form *nyaawang* “see+PAST” in Gumbaynggirr and Yaygirr of north-eastern NSW. This clearly presupposes an earlier *-wa* inflection, especially since the Past of other irregular verbs in Gumbaynggirr consists of the addition of *ng* (the normal Past inflection) to irregular stems that likewise continue an earlier Imperative, such as *yaarrang*, *maarrang*, and *tyurraang* for the erstwhile *n/rr* verbs “go”, hold, and “tell” respectively (Morelli 2008: 294–295). An extended verb stem reflecting *nhaawa-, with absorbed *-wa*, is found in a number of Cape York Peninsula languages (see Hale 1976: 56; Alpher 1990: 163; Dixon 2002: 229).

These widely distributed cognate forms provide evidence for a separate proto-suffix **-wa* that occurred in some paradigms. It is likely that its value may not have been the same as that of **-ngka*, which is reflected as Imperative. It may have had another modal value (as in Ritharrngu) and shifted its function to Imperative in some subgroups.

4.2.3 *Aberrant forms of the *nhaa- “see” paradigm*

Although Dixon posits *-ka* as the invariant original Imperative suffix, he does not reconstruct any monosyllabic verbs where this suffix (or the Purposive **-ku*) directly follows a vowel-final root. Dixon includes “see” among his reconstructed verbs with final *ng*, which is reflected in its membership in the *ng*-class in many languages, and reconstructs inflected forms **nhaangka* Imperative and **nhaangu* Purposive. However, “see” is often an aberrant member of the *ng*-class. Alpher (1990: 163) notes that **nhaangu* is not attested in eastern languages and tentatively reconstructs an Imperative **nyaawa*, while noting another possible Imperative **nyaaya*.

In Walmajarri, Dixon (1980: 388) notes, the Imperative and Future inflections may occur as *nyaka* and *nyaku*, with optional loss of *ng*, which he interprets as nasal dissimilation conditioned by the word-initial nasal. (Forms *nyangka* and *nyangu* are characteristic of the eastern dialect, according to Richards & Hudson 1990: 202.) This slight irregularity in the paradigm of **nhaa-* recurs in a number of other languages and is sufficiently widely distributed that the pPN forms should be reconstructed as **nhaaka* and **nhaaku* without *ng* preceding *k*. Where forms that reflect *-ngk-* do occur these can easily be explained as the result of the analogical influence of the other (*ng*-class) verbs which share the remainder of their inflections with “see”. Languages that show evidence of this *ng* include, besides Walmajarri, other languages in the Ngumpin-Yapa subgroup (e.g. Gurindji, Warlpiri) and Ritharrngu in the Yolngu subgroup, as seen above.

Evidence for inherited **nhaaka* and **nhaaku* may come either from inflections in *-ka* and *-ku* or from stems that have absorbed either of these suffixes. Inflectional *-ku* occurs in Western Desert *nyaku*, beside Imperative *nyawa*. For north-eastern Australia, Dixon (2002: 230) mentions the irregular Imperative *nyaka* of Kuku Yalanji “see”, whose other forms are based on a stem *nyaty-*. In Gadhang of New South Wales the Imperative *nyaaka* of “see” contrasts with *pungka* for “hit”. Similarly, in the Victorian language Wemba-Wemba (and in other Victorian languages) *nyaka* “see” lacks the nasal of *pungka* “spear”, which seems to be the Victorian reflex of “hit” (Hercus 1992: 51).

Dixon (2002: 229f) refers to a great many language groups that have reanalysed the verb stem as disyllabic, incorporating an erstwhile inflection. He cites stems reflecting **nhaaku* in the Pilbara languages of WA, the Thura-Yura

languages of SA, and languages of the Lake Eyre Basin, and reflexes of *nhaaka in Wirangu of South Australia, languages of the Lake Eyre Basin, languages of the Maric subgroup of Queensland, and languages of the Central East Coast and western Victoria. It is worth noting that, while several groups have stems including *-nga* (languages of Western Victoria and south-western Australia), none use a stem containing *-ngku* or *-ngka*, which would be expected if these had been the earlier Purposive and Imperative inflections, as other former *ng*-class verbs have incorporated these inflections. Dench (1998:96) shows that among the Pilbara languages *nhaku-* occurs in Thalanyji and Jurruru, and a form with lenited consonant *nhawu-* (< *nhaku) in Yindjibarndi, Kurrama, Ngarluma, and Martuthunira, while all of these languages except Thalanyji have for “give” a stem *yungku-* with an absorbed suffix *-ngku*. The Thura-Yura languages of South Australia show *nhaku- “see” beside *pungku- “kill” (< *hit) and *yungku- “give”; Wirangu, however, has the stem *nhaka-*, also without the nasal.

Doubtless the verb “see” has been attracted to the nasal inflection in some languages, including Eastern Walmajarri and other languages in the Ngumpin subgroup. Furthermore in Ritharrngu the Future inflection (from the inherited Purposive) *nhaangu* of “see” is identical to that of *gaangu* “carry”, both reflecting *ngku as *-ngu* as the result of a regular sound change that deletes the stop after a homorganic nasal.

The weight of comparative evidence thus suggests that the proto-paradigm of *nhaa- did not include in its Imperative and Purposive the nasal that occurs in other inflections of this verb as well as in the Imperative and Purposive of other *ng*-class verbs. The inflectional paradigm of this verb thus provides a good example of a shared irregularity that can be projected back to the proto-language. The verb “give”, which is found in eastern languages in the form *wu-*, appears to share with “see” an Imperative in *-ka*. This casts doubt on whether it can be identified (as in Dixon’s reconstruction) with the western PN root *nh/ny/yu-*, which typically inflects according the main *ng*-class rather than with the partially aberrant *nhaa-.³⁰

5. Summary and conclusions

We have seen that in the synchronic description of verb inflection, the morphemic approach has sometimes led to the positing of “morphemes” whose sole function

30. The correspondence of the root-initial consonant *w* of the Eastern languages is also hard to reconcile with the *nh of the other languages.

is to mark an inflectional class. These so-called “conjugation markers” have proved problematic because they are not present in all inflected forms, and their occurrence is typically not describable in terms of phonologically plausible rules. For many languages it is necessary to recognize “parasitic formatives”, identical to inflections, which are used as part of the base for other inflections.

In describing diachronic developments in Australian verb inflection, one must be aware of the ever-present potential for the reanalysis of forms, especially those of monosyllabic roots, which can alter the shape of a verb stem. There is also a need to recognize intra-paradigm analogical changes which result in novel combinations of a stem and its inflectional suffixes. Analogical changes between paradigms also must be recognized, especially the influence of major classes on minor and irregular inflectional patterns. The operation of analogical changes is irregular, in the sense that it is not possible to predict which particular models will be used to create a novel form nor explain why a particular change has occurred at a particular time (which is called the “actuation problem” in historical linguistics).³¹ I suggest, however, that it is worth studying more closely particular instances of the creation of new inflections on existing stems, along the lines discussed in Harvey (2008).

In doing historical reconstruction it is important methodologically to observe the regularity of phonological changes as a general principle. Our aim, furthermore, should be to reconstruct the inflectional pattern of individual lexical verbs before generalising about the inflectional system of the proto-language. Inflectional classes cannot be reconstructed apart from their membership. Thus the method of reconstruction must involve more individual etymological comparison than typological and general comparison.³² In terms of what can be reconstructed for pPN verbal paradigms, they will turn out to be more heterogeneous than in many modern languages.³³ We should be prepared to see a number of inflectional patterns manifested in the paradigms of monosyllabic verbs – if not as many as the 29 reconstructed for proto-Arnhem by Green (2003). For polysyllabic verbs,

31. Thus it is probably not possible to fully answer Dixon's (2002:224) challenge in response to the claim of Alpher et al. (2003) about the analogical extension of consonants from particular inflectional suffixes: “Some explanation is then needed for why ‘conjugation markers’ are found just in some ‘Pama-Nyungan’ languages but not in others, and why – in those languages in which they do occur – they occur only at certain root-affix boundaries and not at others”.

32. Dixon's (2002:227) “general profiles of classes across the continent”, whatever their usefulness for synchronic typology, cannot be directly employed to reconstruct proto-systems.

33. Cf. Alpher's (1990:169) conclusion: “What emerges in reconstruction is a system that lacks the conjugational symmetry that many of the modern languages possess”.

however, it will be harder to be certain about their inflection, in my opinion, since they are more likely to occur in larger, more open classes, whose membership and inflectional patterns may not be stable enough to provide confident cognate sets.

This study of method in the reconstruction of PN verb inflection can serve, I hope, as a contribution to the theory of reconstruction, which is relevant to inflectional classes in any language family.

References

- Alpher, Barry. 1990. Some Proto-Pama-Nyungan paradigms: A verb in the hand is worth two in the phylum. In *Studies in Comparative Pama-Nyungan* [Pacific Linguistics C-111], Geoffrey N. O'Grady & Darrell T. Tryon (eds), 155–171. Canberra: Pacific Linguistics.
- Alpher, Barry. 2004. Pama-Nyungan: Phonological reconstruction and status as a phylogenetic group. In *Australian Languages. Classification and the Comparative Method* [Current Issues of Linguistic Theory 249], Claire Bowern & Harold Koch (eds), 93–126. Amsterdam: John Benjamins.
- Alpher, Barry. 2005. Review article: R.M.W. Dixon, *Australian Languages. Their Nature and Development* (Cambridge: University Press, 2002). *Language in Society* 34: 795–805.
- Alpher, Barry, Evans, Nicholas & Harvey, Mark. 2003. Proto Gunwinyguan verb suffixes. In *The Non-Pama-Nyungan Languages of Northern Australia. Comparative Studies of the Continent's Most Linguistically Complex Region* [Pacific Linguistics 552], Nicholas Evans (ed.), 305–352. Canberra: Pacific Linguistics.
- Amery, Rob. 2000. *Warrabarna Kurna! Reclaiming an Australian language*. Lisse: Swets & Zeitlinger.
- Anderson, Stephen R. 1992. *A-morphous morphology* [Cambridge Studies in Linguistics 62]. Cambridge: CUP.
- Anttila, Raimo. 1989. *Historical and Comparative Linguistics*, 2nd revised edn. Amsterdam: John Benjamins.
- Bloomfield, Leonard. 1939. Menomini morphophonemics. *Travaux du Cercle Linguistique de Prague* 8: 105–15.
- Bowern, Claire. 2009. Conjugational class stability: Charting the history of conjugation classes in Yolŋu languages. Paper presented to the 19th International Conference on Historical Linguistics, Nijmegen, 10–14 August 2009.
- Campbell, Lyle. 1996. On sound change and challenges to regularity. In *The Comparative Method Reviewed: Regularity and Irregularity in Language Change*, Mark Durie & Malcolm Ross (eds), 72–89. Oxford: OUP.
- Campbell, Lyle. 2004. *Historical Linguistics. An Introduction*, 2nd edn. Edinburgh: EUP.
- Carew, Margaret. 1993. Proto-Warlwarric Phonology. BA(Hons) thesis, Melbourne University.
- Dench, Alan. 1998. What is a Ngayarta language? A reply to O'Grady and Laughren. *Australian Journal of Linguistics* 18: 91–107.
- Dench, Alan. 2003. From purposive/future to present: Shifting temporal categories in the Pilbara languages of north west Western Australia. In *Historical Linguistics 2001. Selected papers from the 15th International Conference on Historical Linguistics, 13–17 August 2001*. [Current Issues in Linguistic Theory 237], Barry J. Blake & Kate Burridge (eds), 87–103. Amsterdam: John Benjamins.

- Dixon, Robert M.W. 1972. *The Dyirbal Language of North Queensland*. Cambridge: CUP.
- Dixon, Robert M.W. 1980. *The Languages of Australia*. Cambridge: CUP.
- Dixon, Robert M.W. 2002. *Australian Languages. Their Nature and Development*. Cambridge: CUP.
- Douglas, Wilfrid H. 1964. *An Introduction to the Western Desert language* [Oceania Linguistic Monographs 4]. Sydney: University of Sydney.
- Garrett, Andrew. 2008. Paradigm uniformity and markedness. In *Linguistic Universals and Language Change*, Jeff Good (ed.), 125–143. Oxford: OUP.
- Goddard, Cliff. 1985. *A Grammar of Yankunytjatjara*. Alice Springs NT: Institute for Aboriginal Development.
- Green, Rebecca. 2003. Proto Maningrida within Proto Arnhem: Evidence from verbal inflectional suffixes. In *The non-Pama-Nyungan Languages of Northern Australia. Comparative Studies of the Continent's Most Linguistically Complex Region* [Pacific Linguistics 552] Nicholas Evans (ed.), 369–421. Canberra: Pacific Linguistics.
- Hale, Kenneth. 1976. Wik reflections of Middle Paman phonology. In *Languages of Cape York*, Peter Sutton (ed.), 50–60. Canberra: Australian Institute of Aboriginal Studies.
- Harris, Alice C. & Campbell, Lyle. 1995. *Historical Syntax in Cross-linguistic Perspective*. Cambridge: CUP.
- Harvey, Mark. 2008. The origin of conjugation markers. In *Morphology and Language History: In Honour of Harold Koch*, Claire Bowern, Bethwyn Evans & Luisa Miceli (eds), 123–137. Amsterdam: John Benjamins.
- Heath, Jeffrey. 1980. *Basic Materials in Ritharngu. Grammar, Texts and Dictionary* [Pacific Linguistics B-62]. Canberra: Pacific Linguistics.
- Heath, Jeffrey. 1990. Verbal inflection and macro-subgroupings of Australian languages: The search for conjugation markers in non-Pama-Nyungan. In *Linguistic Change and Reconstruction Methodology*, Philip Baldi (ed.), 403–187. Berlin: Mouton de Gruyter.
- Hercus, Luise A. 1992. *Wembawemba Dictionary*. Canberra: The author.
- Hetzron, Robert. 1976. Two principles of genetic reconstruction. *Lingua* 38: 89–108.
- Hock, Hans Henrich & Joseph, Brian. 1996. *Language History, Language Change and Language Relationship. An Introduction to Historical and Comparative Linguistics*. Berlin: Mouton de Gruyter.
- Hockett, Charles F. 1954. Two models of grammatical description. *Word* 10: 210–31.
- Hudson, Joyce. 1978. *The Core of Walmatjari Grammar*. Canberra: Australian Institute of Aboriginal Studies.
- Koch, Harold. 1990. Do Australian languages really have morphemes? Issues in Kaytej morphology. In *Language and History. Essays in Honour of Luise A. Hercus* [Pacific Linguistics C-116], Peter Austin, Robert M.W. Dixon, Tom Dutton & Isobel White (eds), 193–208. Canberra: Pacific Linguistics.
- Koch, Harold. 1995. The creation of morphological zeroes. In *Yearbook of Morphology 1994*, Geert Booij & Jaap van Marle (eds), 31–71. Dordrecht: Kluwer.
- Koch, Harold. 1996. Reconstruction in morphology. In *The Comparative Method Reviewed. Regularity and Irregularity in Language Change*, Mark Durie & Malcolm Ross (eds), 218–263. Oxford: OUP.
- Koch, Harold. 2000. Order and disorder in the reconstruction of the ablaut pattern of athematic verbs in Proto-Indo-European. In *Proceedings of the Eleventh Annual UCLA Indo-European Conference, Los Angeles June 4–6, 1999*. [Journal of Indo-European Studies Monograph Series No.35], Karlene Jones-Bley, Martin E. Huld & Angela Della Volpe (eds), 251–266. Washington DC: Institute for the Study of Man.

- Koch, Harold. 2003. Morphological reconstruction as an etymological method. In *Historical Linguistics 2001. Selected papers from the 15th International Conference on Historical Linguistics, 13–17 August 2001*. [Current Issues in Linguistic Theory], Barry J. Blake & Kate Burridge (eds), 271–291. Amsterdam: John Benjamins.
- Koch, Harold. 2008. R.H. Mathews' schema for the description of Australian languages. In *Encountering Aboriginal Languages. Studies in the History of Australian Linguistics* [Pacific Linguistics 591], William B. McGregor (ed.), 179–218. Canberra: Pacific Linguistics.
- Koch, Harold. 2009. On reconstructing pronominal proto-paradigms: Methodological considerations from the Pama-Nyungan language family of Australia. In *Discovering History through Language. Papers in Honour of Malcolm Ross* [Pacific Linguistics 605], Bethwyn Evans (ed.), 317–344. Canberra: Pacific Linguistics.
- Koch, Harold. 2011a. Morphological change. In *The Cambridge Encyclopedia of the Language Sciences*, Patrick Colm Hogan (ed.), 514–515. Cambridge: CUP.
- Koch, Harold. 2011b. Teaching historical linguistics: A personal memoir. In *Teaching Linguistics. Reflections on Practice*, Koenraad Kuiper (ed.), 66–86. London: Equinox.
- Lass, Roger. 1977. Internal reconstruction and generative phonology. *Transactions of the Philological Society* (1975):1–26.
- Lass, Roger. 1997. *Historical Linguistics and Language Change*. Cambridge: CUP.
- Lissarrague, Amanda. 2010. *A Grammar and Dictionary of Gadhang*. Nambucca Heads NSW: Muurrbay Aboriginal Language & Culture Co-operative.
- Maiden, Martin, Andrew Swearingen & Paul O'Neill. 2009. Imperative morphology in diachronic evidence from Romance languages. In *Historical linguistics 2007. Selected papers from the 18th International Conference on Historical Linguistics, Montreal, 6–11 August 2007*. [Current Issues in Linguistic Theory 308], Monique Dufresne, Fernande Dupuis & Etleva Vocaj (eds), 99–108. Amsterdam: John Benjamins.
- Mathews, Peter Hugo. 1972. *Inflectional Morphology. A Theoretical Study Based on Aspects of Latin Verb Conjugation* [Cambridge Studies in Linguistics 6]. Cambridge: CUP.
- Mathews, Peter Hugo. 1991. *Morphology*, 2nd edn. Cambridge: CUP.
- Meillet, Antoine. [1954]1967. *The Comparative Method in Historical Linguistics*, translated by Gordon B. Ford, Jr. Paris: Librairie Honoré Champion.
- Morelli, Steve. 2008. *Gumbaynggirr Dictionary and Learner's Grammar = Gumbaynggirr bijjaar jandaygam, ngaawa gugaarrigam*. Nambucca Heads NSW: Muurrbay Aboriginal Language & Culture Co-operative.
- O'Grady, Geoff N. 1990. Prenasalisation in Pama-Nyungan. In *Linguistic Change and Reconstruction Methodology*, Philip Baldi (ed.), 451–476. Berlin: Mouton de Gruyter.
- Osthoff, Hermann & Brugmann, Karl. [1878]1967. Preface to morphological investigations in the sphere of the Indo-European languages. In *A Reader in Nineteenth-century Historical Indo-European Linguistics*, Winfred P. Lehmann (ed.), 197–209. Bloomington IN: Indiana University Press.
- Richards, Eirlys & Hudson, Joyce. 1990. *Walmajarri-English Dictionary*. Darwin: Summer Institute of Linguistics.
- Robinson, George Augustus. 2000. *The Papers of George Augustus Robinson, Chief Protector, Port Phillip Aboriginal Protectorate*, Vol 2: *Aboriginal Vocabularies, South East Australia, 1839–1852*, Ian D. Clark (ed.). Clarendon VIC: Heritage Matters.
- Schane, Sanford A. 1973. *Generative Phonology*. Englewood Cliffs NJ: Prentice-Hall.

- Simpson, Jane. 2001. Preferred word order and the grammaticalization of Associated Path. In *Time over Matter: Diachronic Perspectives on Morphosyntax* [Studies in Constraint-based Lexicalism], Miriam Butt & Tracy Holloway King (eds), 173–208. Stanford CA: CSLI.
- Simpson, Jane & Hercus, Luise. 2004. Thura-Yura as a subgroup. In *Australian Languages. Classification and the Comparative Method* [Current Issues in Linguistic Theory 249], Claire Bowern & Harold Koch (eds), 179–206, 581–646. Amsterdam: John Benjamins.

