

Defining complexity: Historical reconstruction and Nyulnyulan subordination

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Abstract

I use data from subordination strategies in Nyulnyulan languages (Non-Pama-Nyungan, Northern Australia) in order to investigate various alternative means of defining and quantifying ‘complexity’. While Edmonds (1999) defines 48 distinct types of complexity (concentrating on social and natural sciences), in this paper I concentrate on three facets of complexity: descriptive complexity, ontological complexity, and parsimony in reconstruction. While historical linguists tend to maximise parsimony, in Nyulnyulan languages the minimization of one aspect of complexity necessarily adds complication elsewhere, and it therefore serves as an appropriate case study of the interdependencies between ontology, syntactic modelling, and language change.

Keywords: complexity, subordination, Nyulnyulan, diachrony, language change

1 Introduction

We find the notion of complexity in various forms throughout the history of research on Australian languages. We find it more often in the early history of language documentation in its converse of simplicity, although even today in Australia we find language attitudes which simultaneously treat indigenous languages as too simple to survive in the modern world, yet too complex for outsiders to study. Even in 1980, Dixon (1980:§1.2) felt the need to disabuse potential readers of the simplicity of Australian languages. Such claims perhaps persist in the widespread notion that Australian languages do not exhibit embedded clauses (for a review of these ideas see, for example, Nordlinger 2006b).

I begin with this point because it shows the importance of considering simplicity and complexity in a wider context. Both complexity and simplicity are relative terms, of course; what one researcher may regard as *simple* will be treated by another as *complex* depending on their level of experience and degree of familiarity with the concept. Linguistic complexity is also theory-dependent; for example, serial verb constructions are complex (and problematic) structures in a syntactic theory that has a strong version of the lexicality hypothesis (see, for example Di Sciullo and Williams 1987),¹ however in a theory where complexity is defined in terms of degree of embedding, they are less complex than subordinate clauses.

In this paper, I use historical reconstruction of subordination strategies in Nyulnyulan languages in order to explore theoretical issues in the definition and use of complexity in language change. I

¹Lexicality is a good area to illustrate arguments of complexity, since it represents one area where we can clearly see the trade-offs in different areas (maximizing complexity of the lexicon and parsimony in syntax, versus a less restricted theory of syntax).

begin with a discussion of more explicit definitions of complexity, especially as they relate to historical reconstruction. After all, we cannot evaluate an idea such as complexity without teasing apart the many different ways in which a time like complexity could apply to the data. I then give three case studies of subordination strategies in Bardi and the other Nyulnyulan languages. I argue that grammaticalization theory itself relies on notions of complexity in other areas of the field of linguistics and that we cannot consider complexity in grammar without also being explicit about what our theories lead us to consider as a complex answer to a question.

2 Defining complexity in (historical) linguistics

The term “complexity” itself is ambiguous between at least three senses.² ONTOLOGICAL COMPLEXITY is a measure of the inherent nature of the item under study. Ontological complexity, assuming that all aspects of a system are knowable, is static. That is, a measure of ontological complexity does not change according to the way an item is described. This contrasts with SEMIOTIC COMPLEXITY, which refers to the “self-complexity of the models which were made to represent reality” (Csányi 1989:15). A type of semiotic complexity is Gell-Mann’s (1995) “effective complexity” (see also Dahl 2004:25ff), which is a measure of the complexity of the internal structure of an item. Complexity is a relative term, not an absolute one (as discussed in the introduction), so we should note that items can only be defined as complex with respect to other items. Finally, we should distinguish local complexity from global complexity. A structure may be locally simple but globally complex, as is for example a single nonbranching node within a tree, or it may be locally complex but globally simple (a single terminal node is more simple than a branching node).

This is all relevant for the definition of complexity within historical linguistics and language change. If we are trying to trace the evolution of a structure within a family, and trying to make claims about its complexity, we need to be explicit about which type of complexity we are talking about, and under which scenario a given event is “more simple” or “more complex”.

Therefore, if we are to evaluate a possible increase in complexity over time, such an evaluation needs to take place along several different parameters, including the following:

- (1)
 - a measurement of the construction’s effective complexity;
 - a measurement of relative complexity with respect to the reconstruction;
 - an evaluation of the role of the particular model used in defining the complexity of the structure.³

This paper is also in part a comment on Givón (2001, 2008) and the feeling that there is more to be said about increasing complexity than “hypotaxis originates in parataxis” (e.g. Givón 2001:218–219), especially when considering the available coordination and subordination strategies in a language as a whole. Let us now consider some data.

3 Nyulnyulan subordination

3.1 Bardi and the Nyulnyulan languages: background to coordination/subordination

Bardi is a non-Pama-Nyungan, Nyulnyulan language spoken now by about 8 people on the Northern tip of the Dampier Peninsula. There is extensive unpublished field data on Bardi dating back

²Edmonds (1999) found 48 distinct definitions of the term in the natural and social sciences, and even within linguistics, there appears some overlap in the terms used. Here, however, I concentrate on 3 senses in which the term ‘complex’ may be used, depending on what it contrasts with.

³For example, in a model with no recursion, a structure of the form 123123123123 is equally complex as one of the form 132321213123.

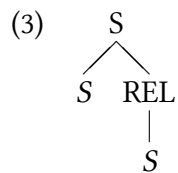
to the Laves collection of the late 1920s; publications include Metcalfe (1975) and Bown (2004). The Nyulnyulan family is quite close-knit, although there are differences in phonology, lexicon and syntax which make the languages mutually unintelligible. The Nyulnyulan languages are all non-configurational and (as far as I can tell from the sources available to me) make use of similar principles of discourse organisation. There are, however, differences in verb morphology and agreement marking, and in the marking of embedded clauses.

3.2 The adjoined relative clause in Australia

The term “adjoined relative” originated in Hale’s (1976) analysis of a certain construction in Warlpiri. An example is given in (2):

- (2) *Ngajulu-rlu=rna yankirri pantu-rnu, kuja=lpa ngapa nga-rnu.*
 1SG-ERG=1SG.SUBJ emu spear-PAST, COMP=AUX water drink-PAST
 “I speared the emu which was/while it was drinking water.” (Hale 1976:78)

Two features of this construction are relevant here. The first is the phrase structure. The Warlpiri adjoined relative clauses are argued to have the following structure:



That is, the adjoined relative is a full clause which is embedded under an S node, but is an adjunct to the main clause. Adjoined relatives in Warlpiri must appear peripherally to the main clause.

The second feature is the semantic interpretation. Such clauses usually have a coreferential argument, but they need not. They are also ambiguous in interpretation between relative clauses and temporal clauses. It seems that the marker of adjunction functions to designate a relation of coreference or cotemporality between the clauses.

Similar constructions are found in many parts of Australia, although should be noted that they are not the only type of relativisation or subordination strategy, and there are languages with switch reference marking (Austin 1980), with relative clauses marked by pronouns (e.g. in the Yolŋu bloc), and nominalisation. The special issue of the *Australian Journal of Linguistics* (26/1) contains information about a number of languages from several different families.

As Nordlinger (2006a) has pointed out, the analysis of Warlpiri in Hale (1976) has been presumed to apply to a wide variety (and the majority) of Australian languages. That is, it has been largely assumed that Australian languages have a single multifunctional type of subordination, which is moreover “syntactically marginal to the main clause” (Nordlinger 2006a:1); Nordlinger also highlights how influential this article has been in interpretations of Australian subordination, and how it has led to a widespread perception that Australian languages do not exhibit syntactic embedding.

3.3 Types of clausal dependency in Nyulnyulan languages

Nyulnyulan languages have clausal dependency structures which superficially resemble the adjoined relatives described by Hale (1976), but they also have other strategies. Some of the structures are overtly marked by sentential clitics or verb morphology, others are unmarked. Some are finite, whereas in others the verb appears with “gerund” morphology (a circumfix *m(a)- (a)n* in all languages). Bardi also has indirect questions.⁴ The constructions mark an array of functions, ranging

⁴I have no data on the other languages in the family on this point.

from signaling causes and results, simultaneous a sequential actions, purpose, as well as relativisation.

As a way of seeing the heterogeneity of multiple clause types in Nyulnyulan languages, consider the following list of clausal dependency strategies in Bardi.⁵

- (4) a. the conjunction *agal* “and” and *arragorror* “but, or” (not further discussed here)
- b. $=b(a)$, a Wackernagel clitic which primarily translates relative clauses; see §3.4;
- c. $=min$, $=gid$, $=(j)amb$, $=(g)arra$, $=gorror$ “if”; Wackernagel clitics which mark clausal dependencies, but not necessarily subordination (see §3.6);
- d. Words which introduce new clauses which are dependent in discourse on a previous clause, including *ginyinggon*, *ginyinggarra*, *ginyinggo* (all roughly “and then”), and, in the Laves corpus (1920s) only, *ranana* “straightaway” (discussed in §3.6);
- e. Case markers, including the purposive *-ngan* “for, in order to” and the semblative *-marr* “when” (with finite or non-finite clauses; see §3.6)
- f. Verb morphology; the simultaneous action marker *-j* “while Xing” (included in this list for completeness but not further discussed here);
- g. Apposition; null marking (for causes, reasons, simultaneous action, or sequential or consecutive actions; see §3.7).

Nyulnyulan relative clauses are heterogenous. In Bardi, they are marked by $=b(a)$, a morpheme which has no cognates in the rest of Nyulnyulan.⁶ In Warrwa, they are marked by a morpheme *-jarr*, which is a verbal suffix that appears in the verb before the agreement markers (in Bardi it marks topic chaining; see below). In both cases there are problems in considering such clauses as embedded. However, they are not paratactic either; there is a dependency (for example, evidence from intonation and word order interleaving strongly indicates that they are a single clause).⁷

In what follows, I consider four facets of dependent clauses in Bardi and Nyulnyulan. First, I discuss Bardi relative clauses (in §3.4) and review the evidence for embedding. In §3.5 I consider adjoined relatives in other Nyulnyulan languages and the cognate construction in Bardi, which is not an embedding construction at all. In §3.6 I review the use of case marking as a subordination strategy in Bardi and other Nyulnyulan languages.⁸ Finally, in §3.7 I explicitly address the issue of null-marked embedding and clause chaining in Bardi, and its consequences for analyses of complexity. Before doing so, however, I review the evidence for embedding.

3.4 Bardi relative clauses

To illustrate the problem of defining hypotaxis in Bardi, let us consider relative clauses. Relative clauses in Bardi, as mentioned above, are marked by the morpheme $=b(a)$. The absence of lenition of */b/* to */w/* or \emptyset would suggest that this morpheme is a clitic rather than an affix, although the point is not crucial here and this test is not entirely straightforward, as a few items which are clearly clitics also undergo lenition. $=b(a)$ is affixed to the first word of the dependent clause which usually (but not exclusively) appears immediately following the relativised noun. If the word to which $=b(a)$ is

⁵Because of the difficulties (discussed in §3.4 for describing a clause as strictly embedded, I here use the more neutral term ‘dependency’ to cover both true embedding and clauses which are semantically dependent on one another.

⁶It probably appears fossilised in *anggaba* “who” (only Bardi has a distinction between ‘who’ and ‘what’; other Nyulnyulan languages have a reflex of Proto-Nyulnyulan **yangki* “what” in both meanings).

⁷McGregor (1994a:35ff) and elsewhere treats this type of clause as subordination, although he notes that parataxis is seldom discussed in descriptions of dependencies in Australian languages.

⁸Nordlinger (1998:162–166) and Dench and Evans (1988) provide discussion of case as complementisers in a variety of Australian languages.

attached ends in a consonant and the following word begins with a vowel, the clitic may be optionally resyllabified as the onset of the initial syllable of the following word.

- (5) *Aamba* [*malarr-b i-na-m-bi-na=jin* *garrgoyi* *diird*
 man wife-REL 3-TRANS-PST-hit.w.hand-PST=3SG.POSS'R completely run.away
i-n-joo-noo.
 3-TRANS-do/say-REM.PST
 “The man who hit his wife ran away.”
- (6) *Aamba* [*diirdi-b i-n-joo-noo* *barda*] *i-na-m-boo-noo* *booloومان.*
 man run.away 3-TRANS-do/say-REM.PST off 3-TRANS-PST-hit-REM.PST bullock
 “The man who ran away killed a bullock.” (AKL.F4)

There are a couple of things to note about the sentences in (5)–(6). The first is that in all such cases, there is obligatory coreference between an argument in the main clause and an argument in the subordinate clause. Most examples involve subject relativization, however examples of other grammatical relations are also found, in both main clause and relativised clause. A few examples are given below:

- (7) *Aarli* [*i-na-marra-na=ba=jirr*] *joord=amba n-inga.*
 fish 3-TRANS-COOK-REM.PST=REL=3PL.IO J=THUS 3-name
 “The fish which he cooked for them is called *joordoo*.”
- (8) *Aamba* *nga-n-jalali-n-j* [*yandilybara=b i-na-moogar-in-j.*]
 man 1-TRANS-stare.at-CONT.-SEQ boat=REL 3-TRANS-make-CONT-SEQ
 “I was watching the man who/as he made the boat.” (AKL.F4)

The example in (8) illustrates an important point about relative clauses in Australian languages in general. They almost never fulfil the sole function of relative clauses. Rather, they are often used to translate simultaneous or subsequent actions, sometimes consecutive actions, and sometimes they function more like switch reference markers (as is the case in Diyari (Austin 1981); see Nordlinger (2006b) for a survey of Australia more generally). This heterogeneity of function is part of Hale’s (1976) argument that such clauses are adjoined to the main clause rather than strictly dependent on the noun. That is, the grammatically-marked relationship in such clauses is one of relations between events, rather than a strict marking of particular participants (see, e.g. Hale 1976:79).⁹

The sentences in (9)–(10) would also appear to point to an adjoined analysis. In (9), for example, the antecedent of the ‘relative’ clause *boogoonb inin* is *ginyinggi ngaarri* ‘that devil’; we might want to analyze this as a case of switch reference, or translate more loosely along the lines of ‘the *ngaarri* devil saw me, the one which lives in the mangroves’. However, note that *ginyinggi ngaarri* is not marked for ergative case. If this were an instance of clause chaining we would not expect the ergative to be omitted. However, we do regularly find the ergative dropped from the antecedents of relative clauses (see further Bowerman (2007) for the relevant data¹⁰).

⁹Hale (1976) notes that in Warlpiri the NP-relative interpretation of such clauses applies when there is a coreferential argument, and the T-relative interpretation when no arguments are shared between clauses. In Bardi, =*b(a)* is not used if there are no shared arguments: there are other dependency markers used in such cases. However, relatives are still ambiguous between NP-relatives and T-relatives.

¹⁰Ergative-marked subjects may be the antecedents of relative clauses, however such sentences are very rare in my corpus and are strongly dispreferred in elicitation.

- (9) *Ginyinggi ngaarri injalij=jarrngayoo* [boogoon=b inin].
 3SG devil 3-TR-(PST)-see-MID.PERF-1SG.DO inside-REL 3-sit-CONT.
 “The spirit, which lives inside [the mangroves], saw me.” (Metcalf 1975:37)
- (10) *Garrma jagoord anja* mayalgarran [booroo=b anjalajan]
 later return 2.FUT-TR-do/say-FUT afternoon time-REL 2.FUT-TR-see-FUT=1sg.IO
 [nyoonoo=mbnganggan boogoon].
 here-THUS 1-FUT-be-CONT inside
 “When you come back in the afternoon, you’ll see me there inside.”

Another problem with the ‘adjoined’ relative clause analysis is that there some examples of sentences which appear to have intertwined ‘subordinate’ clauses.¹¹ That is, constituents within the clauses are not clausebound. Consider (11) from the Laves corpus:

- (11) *Gooyarra* [arra irrhoonggoon] *ingarrjimbina* nyoonoo ingarramarnirr aambanim malgin
 2 NEG know die here put man-ERG in secret
nyini irr.
 here 3AUG
 “They didn’t know that two [men] had died and a man had been put there hidden.” (Laves n.d.:103/72)

The phrase *gooyarra* ‘two’ is the subject of *ingarrjimbina*, but *arra irrhoonggoon* is the main clause. Therefore either *guyarra* has raised out of the subordinate clause, or it is the object of *irrhoonggun*, and the sentence should more literally be translated ‘they didn’t know the two, [that] they had died’, although this is rather unlikely, as *irrhoonggoon* does not usually take a nominal complement. It is not even a verb: it is a noun meaning something like ‘knowledge’. We have the same potential problem with (9) above; if the relative clause is part of the NP, either it has been extraposed or the phrase is discontinuous. Discontinuity is found in noun phrases in Nyulnyulan languages, but the conditions under which it is used are not directly comparable to those in Warlpiri. It is much more restricted. (And note, incidentally, that Warlpiri discontinuities are clause-bound.)

In summary, Bardi relative clauses have a number of features of adjunction rather than embedded subordination. However, in either case, we have cases where constituents do not appear to be clause bound. Clausal embedding of this type is rare in Australia (although not unknown¹²). The etymology of this construction is unclear in Nyulnyulan languages. It may be tempting to assume one of Givón’s (2008) pathways, such as clause chaining > embedding. However, we have no evidence for this within the language. The argument would be purely one from parsimony (that is, given such a strategy is claimed for languages elsewhere, it is most parsimonious to assume the same diachronic pathway here rather than multiplying entities).

3.5 *jarr*-marking

A different type of problem in Nyulnyulan subordination can be found in the analysis of words which contain the morpheme *-jarr-*. It is found in both Eastern and Western Nyulnyulan languages. It is found in all of the eastern languages, where it is either a general subordinator (as in Yawuru),

¹¹Nordlinger (2006b:6) points out that while the majority of Australianists have interpreted Hale’s (1976) claim about adjunction as a claim that Warlpiri does not have syntactic imbedding, Hale consistently refers to such clauses as subordinate. Hale (1976:85, (22)) assumes a structure [S REL]_S.

¹²Many of Nordlinger’s (2006b) examples of Wambaya centre-embedding are single non-finite verbs. In this case, it is difficult to tell whether such items are really embedded clauses, or whether they are really nominals. (This is an issue for further study, not a claim that Nordlinger is incorrect.)

a marker of relative clauses (as in Warrwa, where it functions somewhat like Bardi =*b(a)*), or it has additional functions in Nyikina which Stokes (1982:322ff) finds difficult to gloss (she uses the term “diffuseness”). It appears to be absent from Nyulnyul and Jabirr-Jabirr.¹³ In Bardi, these forms are not used in subordination at all, but rather mark topic chaining. Examples from the individual languages follow.¹⁴

In Warrwa (McGregor 1994b:58ff), *-jarri* ~ *-yarri* functions as a general marker of subordination, and is glossed as introducing a temporal adverbial clause which “locates the situation referred to by the main clause as subsequent to the situation referred to by the dependent clause” (as in (12)). This morpheme is also used in marking conditional clauses.

- (12) *ngambalany-jarri bij nganandiny ngajanu naarda.*
 1SG:awoke-SEQ open 1SG:got my eyes
 “When I woke up I opened my eyes.” (McGregor 1994b:58)

The marker is argued by Capell (1952:452) to be a relative pronoun, on the basis of examples such as (13).

- (13) Warrwa
garndirrin-ngana waarra gurd ngindanjarri.
 platform-ALL take die 3SG-PRES/PST-do-PST-JARRI
 “Take the man who died to the tree platform.” (Capell 1952:452)

Further examples from McGregor’s fieldnotes show that =*jarri* in Warrwa also functions as a clausal connector. All the examples I have found (of which those in (14) are a sample) involve the conjunction of clauses which have the same subject.

- (14) Warrwa
 a. *nyinggan narndin -jarri -yirr narndin -yirr/ nanggana -yirr jimbin/*
 here he:grabbed -SEQ -3PL.OBL he:grabbed -3PL.OBL he:locked -3PL.OBL inside
 “When he had grabbed them, he locked them up.” (WM/FN: fm3;13)
 b. *yalkarn ngandin kung ngandin -jarri wila*
 burp I:did drink I:did -SEQ water
 “I burped from drinking water.” (WM/FN: fm;9,166)
 c. *mawu ngangariny liyan nganjalin -jarri*
 happy I:got feel I:saw -SEQ
 “I got happy when I saw him.” (WM/FN: fm;9,171)
 d. *ngarndany -jarri -yina jina -ngana buru nganyjalany -jirr -wili wirrin -mili*
 I:went -SEQ -3SG.OBL his -ALL place I:saw -3PL.ACC -du sick? -??
dardarl -kurdany yuk jina
 sick -COMIT camp his
 “When I got there I found them sick in bed.” (WM/FN: fm;10,78)

¹³There is not enough data for Nimanburru to determine how subordinate clauses are formed in that language.

¹⁴*Pace* Givón (2008:2), there is a fourth method of reconstruction; that is, syntactic reconstruction using the comparative method; see Harris and Campbell (1995), for example.

In Nyikina (Warrwa's closest relative), *-jarri* ~ *-yarri* has these functions, however in addition it may also mark multiplicity (all the examples given in Stokes (1982:322) involve the object argument), or circuitous movement. In such cases, the marker is not used in subordination. Examples follow. (15) shows a subordinate use of the morpheme, whereas (16) shows a multiple argument use.¹⁵

- (15) *Yim-bula-ny-dyarri ng-la-ba-na.*
 3SG-COME-PAST-REL 1SG-IRR-see-PAST
 "If he had come, I would have seen him." (Stokes 1982:321)
- (16) *Ngam-biga-ny-dyarr-irr manydja yila.*
 1SG-have-PAST-REL-3PL.DO many dog
 "I used to have lots of dogs." (Stokes 1982:322)

In one dialect of Nyikina, *-jarri* is seldom found; instead, the morpheme is *-ja*. I do not know if both these morphemes have the same etymology.¹⁶

In Yawuru, like in Warrwa, the morpheme is used as a subordinator, and this is its sole use in Yawuru.¹⁷ There are no constraints on subjecthood or coreference, although it seems to be the case that there is a coreferential argument in most of the examples given in Hosokawa's grammar.¹⁸

- (17) *Wa-ng-ga-bula-dyarri, nyamba wal-a-ø-dyina milimili.*
 3_i-EN-FUT-COME-SEQ this 2FUT-TR-give-3DAT_i letter
 "When he comes, give this letter to him." (Hosokawa 1991:§4.4.2;(82))
- (18) *Yaga-rr-a-miri-dyarri nyanga-dyunu!, wa-ng-ga-rda-dyayrda birn'dany-dyi warli.*
 12"-AGM-TR-finish-SEQ this-really 3-EN-FUT-go-12"DAT stingray-DAT meat(DAT)
 "As soon as we finish all this, he will go and catch some stingray for us to eat."
 (Hosokawa 1991:§10.6.2.1, (170))

Yawuru *-dyarri* marking is unusual in that there is a strong preference for the dependent clause to precede the main clause. No other Nyulnyulan language is reported as having this restriction. The examples given for Warrwa in this section, for example, demonstrate that no such order is required in that language.

In Bardi, the cognate morpheme is *jarr-*, and it attaches to the direct object and oblique agreement markers. Direct object and oblique speech participant agreement clitics have two forms. (19) illustrates this with a minimal pair using the verb "to give":¹⁹

¹⁵I suspect in the light of examples from Bardi that the number marking in Nyikina might be a red herring, however I do not have enough textual data for this language to look into it and context is not provided for the examples in Stokes (1982).

¹⁶It is possible that *-ja* is cognate with the Bardi simultaneous marker *-j*; however in Bardi the two markers are clearly unrelated functionally. If *-jarri* and *-ja* do not have the same source in Nyikina, we would have to assume that there has been some morphological conflation. There is certainly no sound change which would derive one from the other in this language.

¹⁷Hosokawa (1991:§10.6.2) suggests that this is a borrowing from the neighbouring language Karajarri, where *-nyarri* is a continuous aspect marker. However, given the cognates as a subordinate marker throughout Nyulnyulan, the different initial consonant, the different placement of the morpheme in the verb, the different functions of the affix, and the fact that verbal morphology is not easily borrowed, I do not find the assumption of borrowing very plausible, despite Karajarri and Yawuru having a long history of contact.

¹⁸In the glossing for (18) 12"-AGM refers to a first person inclusive plural agreement marker.

¹⁹This section closely follows Bower (2008).

- (19) a. *Ana=ngay* *oola!*
 2.IMP-TR-give-FUT=1SG.DO water
 “Give me [some] water!”
 b. *Ana=jarrngay!*
 2.IMP-TR-give-FUT=1SG.DO
 “Give it to me!”

As seen from examples such as (20), in Bardi *jarr-* forms have no relative function. They do not have to occur in a dependent clause, and they do not track arguments or mark argument coreference or dependency in general (in fact, they only occur with first and second persons).

- (20) *i- noo- moondoo -na -na -ng =jarrngayoo*
 3- TRANS- wet -cont -pst -APPL =1sg.DO
 “He kept on wetting me with it.” (Metcalf 1975:107)

*Jarr-*forms (as I will call the set) are transparently related to the unmarked set of object agreement markers. Aklif (1993) says that the *jarr-*forms are used after stems ending in a consonant. Metcalfe (1975) argues that *jarr-*forms occur on stems containing an odd number of syllables. Neither of these distributions accounts for the data, as syntactic minimal pairs like (19a) and (19b) show. The distribution cannot be phonological.

There are two very common frames where the *jarr-*forms occur. The first place where *jarr-*forms occur is where arguments are contrastive, such as in (21b) below. The second is where there is a third person subject and first or second person object, and the speech act participant is featured in the discourse over several clauses (that is, the object is a grammatical topic in the sense it is used in frameworks such as LFG: see, for example, Dalrymple (2001)). This is shown in example (21c).

- (21) a. *Mangir inkalan=jarrngay iiganim alig ngandan.*
 always 3-TR-visit-1SG.DO, sickness-ERG pain 1-TR-do/say-CONT
 “She’s always visiting me when I’m sick.”
 b. *Niiwandi=jarrngay, joo ngaada=jirri.*
 tall-1SG.DO 2SG short-2SG.DO
 “I’m tall, [but] you’re short.”
 c. *Marbiddynim inanggalajarrngay bardi, gooyarr aalga inggoodali=jarran*
 M.-ERG 3SG-TR-PST-visit=1SG.DO yesterday 2 day 3-PST-lost=1SG.IO.TOP
arra darr oolarnajan.
 NEG come 3-IRR-spear-PST=1.IO.
 “Marbiddy came to visit yesterday, for two days I didn’t know where she was, she didn’t come to my place.”

The forms with *=jarr-* are cognate with verb forms marking relative clauses in the related languages Warrwa and Nyikina. It is not surprising that a marker with the function of introducing relative clauses, that is, one that establishes co-reference relations in syntax, should be co-opted to track and signal coreference across clauses. What is surprising, however, is that the forms are only used for speech act participants, especially since relative marking is not restricted to speech act participants in Nyikina and Warrwa. Perhaps the *jarr-*forms also have functions which are linked to discourse-based obviation (for which see, for example, Aissen 1997). Given the strong preference for use of these forms when a participant lower on the person hierarchy is acting on someone higher

up the hierarchy, an obviation-based account is plausible. Some of the examples in Warrwa are ambiguous between the type of sentence connective that Warrwa has and the Bardi-type examples with topic marking, and could be topic chaining. I assume that such examples are the source of the reanalysis in Bardi.

In summary, there are several differences between Bardi-type jarr-marking and that found in the Eastern languages. In the eastern languages, jarr-marking links clauses in a more or less definite way. It works rather similarly to *=b(a)* marking in Bardi. In Warrwa it may link either particular participants or events, whereas in Nyikina there is an additional use in non-subordinate contexts. In none of the eastern languages is jarr-marking limited to speech act participants, in fact almost all of the examples in the grammars involve third persons. In Bardi, however, jarr-marking is not used in any of these functions. Rather, it tracks speech act participants in grammatically marked discourse functions.

Theoretically, there are several plausible pathways of change which would allow us to derive these results. We could imagine a pathway of change where a general subordinate clause marker became associated with ‘linking’ participants between clauses [that is, as an adjoined relative clause marker], then restricted to chaining topics before being further restricted to use with speech act participants through the rise of obviation. However, we could also imagine the reverse scenario: that is, a marker which tracked obviation and speech act participants through discourse could be grammaticalised as a marker of relative clauses [which further specify information about particular participants], and then extended to a more general function once the basis for obviation was lost. Topic chaining in discourse through grammatical agreement marking is quite rare, and an obviation-type system which is only marked on speech act participants seems to be unique to Bardi. Therefore any historical solution is likely to have few (if any) parallels in other languages.

If we assume universal pathways of discourse > syntax > morphology, that could give us an answer (cf. Givón 2008). Givón’s (2008) hierarchy is parsimonious, and historical linguistics has long made use of Occam’s razor in historical reconstruction, whether through internal reconstruction or through the use of the comparative method. However, in this case we have no particular reason to assume one solution is more parsimonious than the other. Moreover, we have no particular reason to assume that language change is itself parsimonious (see also analogous arguments for biological phylogenetic work by Sober 1991).

3.6 Nyulnyulan case marking and ‘subordination’

My next case study within Nyulnyulan takes up this question of discourse leading to syntax or vice versa. Nyulnyulan languages have structures which look superficially similar to embedding in other languages, in particular what are called XCOMP structures in LFG (Bresnan 2001). Such constructions make use of case marking. They are the preferred method of forming subordinate clauses in Nyulnyul. They also found in Bardi, although they’re much less common. In such constructions, there is a finite matrix clause. There is a further clause, which is either finite or non-finite (depending on the language) which is marked for case. The marker appears either on the verb or on the first constituent of the clause.²⁰

(22) Bardi

Bijorr-o i-n-alinygarna-n [wirr-ngan m-arrmi-n].
 there-ABL 3-TR-try-CONT lift-PURP GER-rise-GER

²⁰Which distribution applies in each language is difficult to determine, since all the examples from Nyulnyul and Warrwa have the verb in initial position in the embedded clause. Either distribution may be possible there.

“From there, he tried to rise up (into the sky).” (AKL:fieldnotes)

In this sentence, there is a matrix verb *inalinygaman* ‘he tried’, which is finite, and another verb *marrmin*, in a nonfinite form (which I have argued is a gerund). There is argument coreference (that is, the subject argument of the finite verb is the same as the notional subject of the nonfinite verb). There is also overt marking of the dependency between the two clauses, in this case by the purposive case marker *-ngan*.²¹

Similar constructions are found in all Nyulnyulan languages. The most common cases used are the semblative, the proprietive, the ablative, and the locative. (23) gives examples from Nyulnyul (McGregor 1994a, 1996). However, in these languages, the verbs are usually finite. Nyulnyul does have gerund marking, but they tend not to be used in these constructions.

(23) **-uk** ‘Locative’

a. *imbulkubulkum indam-uk=ngay*
it.swelled he.hit-LOC-me

“It swelled where he hit me.”

b. *ingalk majikarr walk injarrjarr-uk*
she.cried sunset sun it.stood up-LOC

“She cried from sunset to sunrise.” lit: (‘She cried at sunset, to the sun’s rizing.’)

Case marking as a marker of finite subordinate clauses is also found in Yawuru. Here is an example with the dative. Again, the verb is finite.

(24) *Dyubagi kayukayu+ nga-na-ngama bulkar-gun, [wanydyi*
tobacco(ABS) soft+ 1-TR-AUX(put(FUT)) ashes-LOC soon
nga-na-ga-lurra-yi].
1-TR-FUT-burn-DAT(PURP)

‘I’ll mix the chewing tobacco leaves with ashes (lit. “making tobacco soft in ashes”) so that I can later enjoy the hot taste of it. (lit. “so that I will burn [it]”)’ (Hosokawa 1991:1067,ex176)

I have not recorded clauses of this type—that is, with case-marked finite verbs—in Bardi, although it is not certain that they do not exist. However, given how common they are in other Nyulnyulan languages, their absence from my Bardi corpus is striking. Instead, Bardi uses either non-finite clauses or finite clauses introduced by a ‘linker’ such as *ginyinggo*, *ginyinggon*, *ginyinggarra* ‘then’ or a Wackernagel clitic. Etymologically, such items are case-marked third person singular pronouns. (25) and (26) are examples.

(25) *Booroo nganjagal=joogarra, boogoon=jamb goorrinkal.*
look 1-TR-see-REC.PST=2AUG.IO inside=THUS 2-AUG-sit-REC.PST

“[When] I looked around for you, I saw you inside.” (or, “I looked around for you, that’s why I saw you inside.”)

(26) *Birarr ingirrinin rawin ingarraman. Anyjimadan booroongan=jirr. Ginyinggo*
behind 3PL.DO-PST go.as.group 3PL.put-PST back camp-all=3PL.POSS’R. Then
oorany joonk innyana arnbanjarr ingilirmanijirr.
woman run 3SG-catch-PST sing.out.in.fright 3SG-call.out-pst=3PL.OBL

²¹Case marking in these languages occurs once per phrase, as a suffix to the first word of the phrase.

“They went behind, travelling as a group. They went back to camp. Then a woman ran off and called out to them in fright.” (L81.27)²²

Forms such as =*jamb*, =*min* and *ginyinggo* are unlikely to be markers of strict subordination, since they mark their clause as being related in some way to the discourse before it, but not specifically to the preceding clause. They require a preceding narrative, but not necessarily coreferential arguments.²³

These clause chainers have a number of forms, including apparently ablative and locative case marked forms, as well as *ginyinggarra*; (-)*garra* is a common temporal marker in the other Nyulnyulan languages but it is not otherwise found in Bardi except in fossilised phrases.²⁴ In the other languages, -*karra* or -*karr* has a subordinating function.

The facts from Bardi lead us to a problem. On the one hand, we could assume that the Bardi structures originate from a paratactic structure, as implied by ‘universal’ pathways of grammaticalization as outlined in Givón (2008). On the other hand, we have no evidence for this type of construction anywhere else in Nyulnyulan languages. Indeed, Australian languages seem seldom to use demonstratives as subordinate clause markers. (Yolngu is one exception that I know of; it is sporadically found elsewhere too.) Moreover, *ginyinggi* in Bardi is not a straightforward anaphoric pronoun. It is specifically used for reactivating lapsed topics (Bowern 2008). Finally, -*karra* is not used in parataxis in any other Nyulnyulan language; in Nyulnyul it marks conditional clauses, while in the Eastern Nyulnyulan languages it has an aspectual use.²⁵ Therefore, we could either reconstruct a pathway which is widely assumed elsewhere in the world, but would be very rarely attested in these particular languages (and which would also multiply the paths needed for reconstruction within the family, because we would have to assume multiple grammaticalization events within individual languages); or, we could assume that Bardi has fossilised this marker and turned it into a discourse chainer; in this case however it would be an example of hypotaxis > discourse dependency, and not the other way around, and therefore apparently a counterexample to Givón (2008).

3.7 Null marking

In addition to the markers discussed in §§3.5–3.6, all the Nyulnyulan languages also make extensive use of juxtaposition/apposition to mark dependencies between clauses.

I have sometimes joked that under Greenberg’s SVO word order typology, Bardi’s basic word order is not SVO, OVS or VSO, but V. In a text count of 171 clauses, 47% contained no argument NPs at all. It is common to go for long stretches of text with no overt markers. (27) is a short example where there is no overt subject NP.

(27) *Aarlingan arr nganjinj* *bardi.* *Langar arrajana,* *arra*
 fish-ALL go 1-TR-do/say-CONT-SIMUL yesterday. bait NEG-1SG.POSS, NEG
ngalinyan *aarli.*
 1-IRR-catch-CONT fish.

“I went fishing yesterday. I didn’t have any bait, [so] I didn’t catch any fish.”

²²*Arnbanjarr* is a mysterious form; it looks like it is cognate with the subordinator *jarri* discussed above; however this is otherwise unknown in Bardi. The sentence is from a text from the 1920s.

²³=*jamb* is perhaps the most syntax-like of these particles in that it appears to be able to precede or follow a clause that it has some sort of relation to. However, it is unclear if this is a coercion effect of elicitation.

²⁴An example is *garra garra garra*, which is a type of elliptical for stuff that happens in a narrative. e.g. < X did something >, *garra garra garra* (X kept on doing it, e.g. they kept on walking), < then they did something else >.

²⁵A morpheme -*garra* is also found in Ngumpin-Yapa languages (where it has clausal and aspectual functions) and may be a borrowing into proto-Nyulnyulan, or a wider areal feature (p.c. Ken Hale, 1999).

In textual data one frequently finds series of clauses which are clearly closely related but which show no overt markers for conjunction or subordination. In (28), for example, there are three verbs. The first two, *nganjarrga* ‘I ask’ (uninflected for tense) and *nganjoogaljirri* ‘I said to you’ are probably appositive, i.e., ‘I ask(ed), I said to you ...’. The ‘subordinate’ clause, ‘if you would give me money’, also has no overt marking of subordination and could be appositive.²⁶

- (28) *Nga-n-jangarrga nga-n-joo-gal=jirri* *goolboo nganyji a-n-a=ngay.*
 1-TR-ask 1-TR-say-REC.PST=2SG.TOP.DO money INTERROG 2-TR-give-FUT=1SG.DO
 “I was going to ask if you would give me money.”

In chained examples of this type, the same subject is usually retained across clauses. In (29), for example, there are no intonation breaks between the verbs and they form a single large prosodic unit.²⁷ However, subject retention is not obligatory.

- (29) *Ginyinggon roowil innyana* *Ngarrigoonbooroo baalingan darr*
 then walk 3-TR-catch-REM.PST Ng. shade-ALL come
inarnajirri *niimana aamba agal ambooriny Ngoolbirndi.*
 3-TR-spear-REM.PST=3AUG.IO many men and people Ng.
 ‘Then Ngarrigoonbooroo walked to her camp and came across many people at Ngoolbirndi.’
 (Laves n.d.:129/19)

These multiple verbs have many of the characteristics of discourse serialization (see Pawley and Lane 1998, for example). They occur in a single intonation contour (although there are also examples with breaks, and examples where intonation units and syntactic units are not isomorphic). They often have the same tense/aspect/mood marking (at least in the prefixal component of the TAM marking), but I have not tested this systematically, and exceptions are found in the quoted data here. For example, (28) above would appear to show sequence of tense effects.

This construction is found in all Nyulnyulan languages. Some examples are given below for Nyulnyul, another Western Nyulnyulan language.

- (30) Nyulnyul (McGregor 1996)
- a. *ingirriran=yirr, ingirrkan wanyji bur-ung*
 they.speared=them, they.brought.it back camp-all
 “They speared them and brought them back to camp.”
 - b. *nyimal kad wanaw, layib wanyji, dumbar wanyji.*
 your.hand bite you.give good you.do fly you.do
 “Cut your wings so that you can fly well.” (cf. ‘cut your wings, you’ll fly well.’)
 - c. *mangir ngajarrijarrin rangar-uk jan malirr arri ilajarrjarr*
 always I.get.up early-loc my wife not she.might.get.up
 “I always get up early, but my wife doesn’t.”
 - d. *kubimin inaw bina wamb malirr murrul baab birray jin injimb*
 government it.gave this man wife little baby mother his 3SG.died
 “The government gave this man and his wife a little baby whose mother was dead.”

²⁶In the textual counts mentioned above, approximately 10% of the clauses could not be clearly divided and so VSV and OVO orders were also included ‘as is’.

²⁷This example was from a text transcribed in 1929 but was confirmed by current Bardi speakers. There are many such examples.

Yaruwu also has apparently ‘paratactic’ dependency:

- (31) *Ngurru wal-a-lurra-dyaw, marlu wa-ng-ga-miri dyungku.*
 more 2FUT-TR-burn-12DAT not 3-EN-FUT-finish fire(ABS)
 “Put more wood on the fire for us so that it will not go out.” (Hosokawa 1991:1046,ex109)
- (32) *I-ny-dyu-nd-dyanu [nga-ng-ga-rda karda-ngarn].*
 3-EN-say-PF-1DAT_i 1_i-EN-FUT-go yonder-ALL
 “He told me to go there.” (lit. ‘he told me I will go there’) (Hosokawa 1991:1061,ex161)
- (33) *Darra+ i-ny-dyu-nda, manydya i-na-rli-nda.*
 belch+ 3-EN-AUX(say)-PF many 3-TR-drink-PF
 “He burps as he drank a lot.” (Hosokawa 1991:1081,ex227)

Therefore, in addition to subordination with an overt marker, we also have what appears to be parataxis. However, it turns out to be rather difficult to show whether the structures are clause chaining, serialization, zero marked discourse dependencies, or subordination proper. In favour of the serialization analysis, at least for Bardi, is the fact that such clauses usually occur under a single intonation contour. In some Nyulnyulan languages, there are sequence of tense effects, which also point to serialization of subordination. Moreover, in some cases the presence or absence of overt nominal material appears to be grammatically constrained. In the following Bardi sentence the noun *oorany* is not omissible:

- (34) *Jaarla nganjagal *(oorany) wiliwilon inkalgal.*
 beach(Ø-LOC) 1SG-TRANS-see-PST woman fishing 3SG-TRANS-visit-IMPERF
 “I saw a woman on the beach, she was fishing.”

However, the sentence without *oorany* is fine as true parataxis, with a pause between the clauses.

4 Summary and conclusions

We can reconstruct several subordination strategies for these languages:

- jarr-marking, probably as an adjoined relative structure, which descends as:
 - adjoined relatives in Warrwa
 - topic-chaining in Bardi
 - general subordination in Yawuru
- case marking:
 - adjoined or embedded? depends on our view of argument structure in the languages more generally;
 - largely lost from Bardi; retained only in limited nonfinite clauses, particular as purposives;
 - retained in both finite and nonfinite structures in other languages;
- zero-marked clause chaining: probably there all along, multifunctional construction; doesn’t ‘turn into’ anything

In conclusion, let me return to a few points brought up early in this paper regarding complexity in explanation. Throughout this paper, I have relied on the idea of parsimony in reconstruction. For example, I argue that Bardi is more likely to have ‘desubordinated’ *karr*-marking than that the other Nyulnyulan languages have independently innovated a subordination strategy on the grounds that a single loss event is more parsimonious than multiple gain events, even if the ‘gain’ follows a well-known grammaticalization pathway. However, such a view minimizes global complexity at the possible expense of local complexity. Moreover, as Lass (1997) and others have observed, there is no particular reason why a language family should adhere to Occam’s razor (see also Sober 1991).

The case of Nyulnyulan subordination exhibits particularly clearly the problem that minimizing complexity in one area of explanation merely increases it elsewhere. Generalizations such as ‘hypotaxis comes from parataxis’ belie the ways that such structures arise. The complexity is more interesting. In this case, we see no overall trend towards greater complexity, and no overall movement towards syntaxis or hypotaxis from parataxis. Rather, as Dahl (2004) has pointed out in other contexts, we see changes and shifts in form and function, and these changes are governed by discourse considerations as much as emerging from it. In these languages, relative clauses are not an isolated construction but are rather multifunctional, and they remain so over any period we can reconstruct. Hendery (2007) provides further examples of multiple pathways to relative clause formation. In such cases, we might wonder whether polyfunctionality compromises participation in macro-pathways such as discourse > syntax > lexis. This requires more investigation.

Overall, there seems to be no general rise in relative complexity over the reconstructible period of the Nyulnyulan family. While we note differences within individual languages, the morphology of subordination appears to be reconstructible. Bardi has undergone the most change. It has largely lost case-marked finite subordination, and it has lost the general marker of nominal relative clauses and adverbial temporal clauses. Instead, clauses with shared arguments are ambiguous, clauses without shared arguments adverbial, but have a different marker, and the inherited subordinator marks topic chaining in speech act participants. It is hard to tell whether this is strictly more complex or not. On the one hand, there are more morphological markers and more constructions, so from a strictly effective point of view there has been a rise in complexity. On the other hand, the multiplicity of constructions results in less ambiguity in parsing, so from that point of view complexity is reduced.

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