Morphology Building Syntax: Constructive Case in Australian Languages

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1   Introduction

A defining characteristic of LFG is that morphological words can carry the same kinds of functional information as syntactic phrases; words and phrases are alternative means of encoding the same syntactic relations (Kaplan and Bresnan 1982, Bresnan 1996).[1] That 'morphology competes with syntax' in this way (Bresnan 1995, 1996) is seen most clearly in nonconfigurational languages where inflectional morphology takes on much of the functional load of phrase structure in more configurational languages like English, determining grammatical functions and constituency relations. LFG is thus well-suited to the analysis of nonconfigurationality and has pioneered much work on nonconfigurational languages, both in Australia and elsewhere (Mohanan 1982, Bresnan 1982, Simpson (1983, 1991), Kroeger 1993, T. Mohanan 1994, Austin and Bresnan 1996, Nordlinger and Bresnan 1996, Andrews 1996, among many others).

In this paper I will be concerned with the function of case in the dependent-marking nonconfigurational languages of Australia. These Australian languages have unusually extensive case marking and case concord. Intuitively, as has been suggested by many researchers working with these languages (e.g. Hale (1981, 1983), Simpson (1983, 1991), Nash 1986, Austin 1993, Evans 1995a), it is this case marking that enables their nonconfigurationality by directly constructing all of the information about grammatical functions, removing the need for such information to also be represented in the phrase structure. I will show that an analysis of case using inside-out function application in LFG can intuitively capture this constructive property of case marking, as well as providing a straightforward account of many unusual properties of case in these Australian languages, including the use of case to mark tense/aspect/mood and the complex phenomenon of case stacking.

2   Data

I will begin by outlining the empirical facts about these Australian languages that I seek to account for. These range from issues much discussed in the literature on nonconfigurationality (Hale 1983, Jelinek 1984, Laughren 1989, Speas 1990, Simpson 1991, Baker (1991, 1996), Austin and Bresnan 1996), such as the interaction of case with free word order and the possibility of discontinuous constituents, to those that have received relatively little attention in recent theoretical literature; case stacking, and the use of case to mark clause-level information such as tense/aspect/mood.

2.1   Case determines grammatical functions

In many of these dependent-marking Australian languages, the order of constituents in simple clauses is grammatically unconstrained in such a way that case marking is frequently the sole indicator of grammatical relations (e.g. Hale (1981, 1983), Austin 1993). In the following (elicited) example from Wambaya, a non-Pama-Nyungan language from the Barkly Tablelands region of the Northern Territory, all orderings of constituents are grammatical as long as the auxiliary (here

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[1]This paper is based on my dissertation, Nordlinger (1997), which has benefitted enormously from advice, comments and suggestions by a large number of people. I would particularly like to thank Joan Bresnan, Peter Sells, Nick Evans, Paul Kiparsky, Mary Dalrymple, Ron Kaplan and Avery Andrews for extensive discussion of these issues. Versions of this paper have also been presented in the Sociable Syntax Supper Group at Stanford (January 1997) and at the Spring Meeting of the Linguistic Association of Great Britain in Edinburgh (April 1997); I am grateful to those audiences for much useful feedback. Finally, I am deeply indebted to my Wambaya teachers Molly Grueman, Minnie Nimara, Mavis Hogan and Powder O'Keefe for teaching me their language, on which many of these ideas are based. Unfortunately, all flaws and inadequacies are my own.

gin-a) remains in second position.[2]

(1) *Ngajbi gin-a   alaji   janyi-ni.*
see   3SG.M.A-PST boy.I(ACC) dog.I-ERG
'The dog saw the boy.'

Alaji gin-a ngajbi janyi-ni.

Alaji gin-a janyi-ni ngajbi.

Ngajbi gin-a janyi-ni alaji.

Janyi-ni gin-a alaji ngajbi.

Janyi-ni gin-a ngajbi alaji.

In Wambaya, as in many of these Australian languages, word order can not be used as an indicator of grammatical function in main clauses: there is no basic order in which the different grammatical functions are associated with particular positions in the phrase structure (Nordlinger, In Press). Instead, information about subject, object, and other grammatical functions is specified solely from the morphology; usually from the case morphology.[3]

2.2   Case concord associates discontinuous constituents

In many of these Australian languages this word order freedom extends to NP constituents, which can appear discontiguously in the clause (e.g. Hale (1981, 1983), Simpson (1983, 1991), Nash 1986, Austin 1993, Nordlinger, In Press). The fact that they belong to a single nominal expression is indicated by their case concord (2–3). Many languages also require complete case (and number) concord within (contiguous) NPs (4–5) (Dench and Evans 1988). Examples here are from Jiwarli (Pama-Nyungan, central-western Western Australia) and Wambaya.

(2) *Nganki   ngiy-a   lurrgbanyi wardangarringa-ni*
this.SG.II.ERG 3SG.F.A-PST grab   moon.II-ERG

alaji   gulug-barda.
boy.I(ACC) sleep-INF
'The moon grabbed her sleeping child.' (Wambaya, Nordlinger 1993:257, ex. 15)

(3) *Karla   wantha-nma-rni   jarnpa   juma.*
fire(ACC) give-IMPER-HENCE light(ACC) small(ACC)
'Give me a small fire light.' (Jiwarli, Austin 1993:15, ex. 13)

(4) *Bungmaj-buli-ji   ngankawuliji wurl-aji   daguma*
old.woman-DU-ERG this.II.DU.ERG 3.DU.A-HAB.PST hit

juwarramba.
men.I(ACC)
'These two old ladies had been killing all of the men.' (Wambaya, Nordlinger 1993:247, ex. 62)

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[2]The abbreviations used in this paper are as follows: A 'transitive subject', ABL 'ablative', ACC 'accusative', ALL 'allative' DAT 'dative', DU 'dual', ERG 'ergative', F 'feminine', HAB 'habitual', I/II/III/IV 'noun class markers', IMPER 'imperative', INF 'infinitive', INST 'instrumental', LOC 'locative', M 'masculine', M.ABL 'modal ablative', M.LOC 'modal locative', M.PROP 'modal proprietive', NEG.POT 'negative potential', NFUT 'nonfuture', NOM 'nominative', NPST 'nonpast', O 'object', POT 'potential', PROP 'proprietive', PST 'past', SG 'singular', SPEC 'specific'.

[3]In some languages like Wambaya, bound pronouns on the auxiliary also determine grammatical functions. In (1), however, we see that the auxiliary information alone is not adequate — in this case it specifies only that the subject is third person singular and has masculine gender, which is true for both noun phrases in the clause.

(5) *Piji-nha   mantharta-nha wanka-rla-rninyja ngulu-pa   martaru-lu.*
   many-(ACC) man-(ACC)   live-make-PST   that(ERG)-SPEC gum-ERG
   'That gum has cured many people.' (Jiwarli, Austin 1993:13, ex. 6)

2.3   Case Stacking

In some Australian languages, case concord extends even to forms that are already inflected with a case affix. This results in case stacking, where a single nominal carries multiple case markers, each one indicating a higher relationship within the clause (Dench and Evans 1988, Simpson 1991, Evans 1995b, Dench 1995b, Austin 1995, Andrews 1996). In these examples case markers do not only determine the grammatical function for the nominal to which they are attached, but provide the relation for higher phrases in which they are embedded also.

(6) *Karnta-ngku ka-rla   kurdu-ku miyi yi-nyi   parraja-rla-ku.*
   woman-ERG PRES-3DAT baby-DAT food give-NPST coolamon-LOC-DAT
   'The woman is giving food to the baby (who is) in the coolamon.'

   (Warlpiri, Simpson 1991:206, ex.187b.)

(7) *... dan-kinaba-nguni dangka-naba-nguni mirra-nguni walbu-nguni.*
      this-ABL-INST   man-ABL-INST   good-INST raft-INST
   '... with this man's good raft.' (Kayardild, Evans 1995a:105, ex. 3-21)

(8) *Ngayu   nhawu-lha tharnta-a*
   1SG.NOM saw-PST   euro-ACC

   mirtily-marta-a thara-ngka-marta-a.
   joey-PROP-ACC pouch-LOC-PROP-ACC
   'I saw that euro with a joey in its pouch.' (Martuthunira, Dench 1995a:60, ex.3.15)

In (6), from Warlpiri (Pama-Nyungan, Central Australia), the locative adjunct *parraja-rla* 'coolamon-LOC'[4] is further inflected with the dative case to indicate that it is predicated of the dative argument of the clause, namely *kurdu-ku* 'baby-DAT'. Thus, the nominal *parraja* is inflected with two case markers: the first indicates that it is a locative adjunct, and the second indicates that it modifies a dative argument. In (7), from Kayardild (non-Pama-Nyungan, North-western Queensland), each member of the embedded genitive phrase 'this man's' is inflected with the ablative case (the case used to mark the genitive relation). Then, by virtue of being embedded within the larger instrumental noun phrase 'with this man's good raft', each member is additionally inflected with the instrumental case, thereby also indicating the function of the higher NP in which they are embedded. And finally, in (8), from Martuthunira (Pama-Nyungan, central coast, Western Australia), the most embedded nominal *thara-ngka-marta-a* 'pouch-LOC-PROP-ACC' is inflected with three case markers. The locative suffix relates 'pouch' with 'joey'; the proprietive suffix relates the embedded phrase 'joey in pouch' to the head nominal 'euro' (note that it is marked on both elements of the embedded phrase) and the accusative case suffix appears on all elements of the higher noun phrase to indicate that it functions as the object of the clause. Thus, the morphological structure of a single nominal can, with the use of stacked case suffixes, mark successively embedded syntactic relationships.

It is clear that case marking in these languages has a fundamental role in determining the syntactic relations. In fact, these relations need not be expressed in the phrase structure at all, but

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[4]A coolamon is a carved carrying dish.

are constructed directly from the case morphology; in these languages the morphology builds the syntax, expressing the same types of relationships encoded in the phrase structure in languages like English. This constructive role of case marking in dependent-marking nonconfigurational languages is not captured explicitly in most formal models, which treat case morphology as marking information that has come from elsewhere in the grammar (e.g. from phrase structure (Bittner and Hale 1996), from the predicate's argument structure (e.g. Simpson 1991), or from case conditionals associating case features with particular grammatical functions (e.g. Andrews 1982, King 1995, Bresnan 1996)). Instead, what is needed is a model of case marking that can capture its function to independently construct information about the syntactic structure. It is such a model that I will propose below.

2.4 Case can mark tense/aspect/mood

In addition to just marking grammatical relations, case morphology in Australian languages can provide various types of information about the clause to which it belongs. The most striking example of this is found in languages in which case markers carry information about the tense/aspect/mood of the clause. In Kayardild, for example, case markers are used in 'modal' function: they appear on all NPs in the sentence except for the subject and provide information about tense and mood (Evans 1995a:107ff, Ch. 10). In this modal function, the case markers do not provide information about grammatical relations at all, but function only to supplement the tense/mood information provided by the verb.

(9) *Ngada   warra-jarra ngarn-kiring-kina.*
    I(NOM) go-PST   beach-ALL-M.ABL
    'I went to the beach.'

(10) *Ngada   yalawu-jarr yakuri-na   mijil-nguni-na.*
     I(NOM) catch-PST   fish-M.ABL net-INST-M.ABL
     'I caught fish with the net.' (Evans 1995a:108, ex. 3-30)

(11) *Ngada   yalawu-ju yakuri-wu   mijil-nguni-wu.*
     I(NOM) catch-POT fish-M.PROP net-INST-M.PROP
     'I will catch fish with the net.' (ibid. p. 109, ex. 3-31)

(12) *Ngada   kurri-nangku mala-wu   (balmbi-wu).*
     1.SG(NOM) see-NEG.POT sea-M.PROP morrow-M.PROP
     'I won't be able to see the sea (tomorrow).' (ibid. p. 404, ex. 10-12)

(13) *Ngada   kurri-nangku mala-y   (barruntha-y).*
     1.SG(NOM) see-NEG.POT sea-M.LOC yesterday-M.LOC
     'I could not see the sea (yesterday).' (ibid. p. 404, ex. 10-13)

In (9) and (10) the ablative case is used in modal function (glossed M.ABL) to indicate that the clause has past tense. This case is marked directly on the direct object *yakuri* 'fish', but is additional to whatever case marking is already present on nominals in other functions, following the instrumental case marker on the instrumental adjunct *mijil-nguni* 'net-INST'. In (11) the clause has future tense rather than past tense, and so the non-subject arguments are inflected with the modal proprietive case (M.PROP) rather than the modal ablative.[5] Examples (12) and (13), in which the

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[5]See Evans (1995a) for a detailed discussion of the modal uses of the various cases in Kayardild, and the relationship of their modal function to their regular case functions.

verb remains constant and variation in the modal case causes a change in the interpretation of the sentence, demonstrate the fact that the modal case is not simply a copy of the tense/mood category marked on the verb. Rather, each inflectional category carries a different component of the semantics of the tense and mood categories, and it is the interaction of the information contributed by the modal case and by the verbal inflection that determines the tense/mood category for the clause as a whole.

Thus, not only must a theory of case be able to capture the constructive property of case marking in determining syntactic relations, it must also be able to account for the fact that case can construct the larger syntactic context, including providing other types of clause-level information such as tense/aspect/mood. This latter function of case has received very little attention in the literature, and is difficult to account for in most analyses of case that treat case morphology as simply providing information about the NP to which it immediately belongs (e.g. Andrews 1982, Neidle 1988, Simpson 1991, Hale and Bittner 1996, among many others).

3   Analysis

My analysis of case marking makes use of the mechanism of 'inside-out' (IO) function application to enable case markers to carry information about the larger syntactic context in which they appear, especially information about grammatical relations. This mechanism is well-established in LFG through the use of Inside-Out Functional Uncertainty (e.g. Halvorsen and Kaplan 1995[1988]) to model such things as anaphora (Dalrymple 1993) and topicalization (Bresnan 1996).[6] 'Regular' (outside-in) function application and 'inside-out' function application can be informally described and contrasted as follows:

'Regular' (outside-in) function application: ($\uparrow$ SUBJ) = $\downarrow$ — the $\uparrow$ refers to a higher f-structure with an attribute SUBJ whose value is $\downarrow$. Thus, defines path *inwards* from higher f-structure ($\uparrow$) through SUBJ attribute to lower f-structure ($\downarrow$).
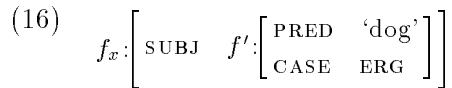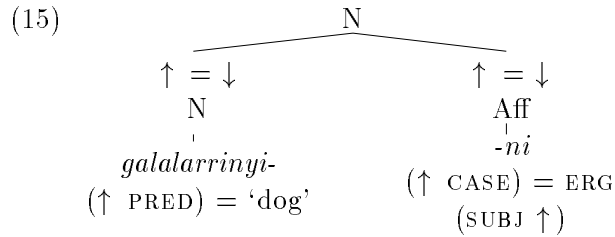
Inside-out function application: (SUBJ $\uparrow$) — the $\uparrow$ refers to an f-structure which is the value of a SUBJ attribute in the immediately containing f-structure. Thus, defines path *outwards* from lower f-structure ($\uparrow$) through SUBJ attribute to next highest f-structure (denoted by (SUBJ $\uparrow$)).

My proposal is that case markers, in addition to carrying a regular case feature, also carry an IO designator specifying information about the grammatical function to which they belong. For example, the information contributed by the Wambaya ergative case marker is given in (14). When it is combined with a nominal stem (as in (15)) it constructs the f-structure shown in (16).[7]

(14)   *-ni*:   ($\uparrow$ CASE) = ERG
                 (SUBJ $\uparrow$)

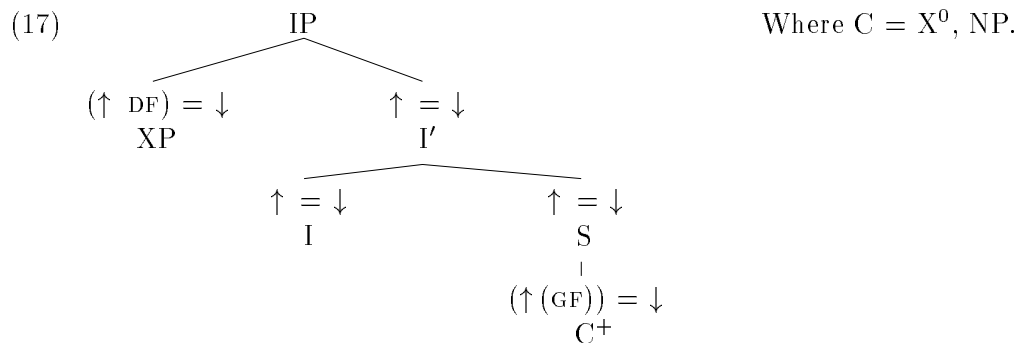
[6]The use of inside-out function application for the present purpose in is inspired in part by the Inside-Out Unification of Andrews (1996).

[7]For expository purposes I am using a fairly simple morpheme-based morphology here. However, nothing in the analysis hinges on such a view of the morphology; the analysis could be translated into a rule-based account with a minimal amount of effort.

(15)

$$
\begin{array}{ccc}
 & \text{N} & \\
\overline{} \\
\uparrow = \downarrow & & \uparrow = \downarrow \\
\text{N} & & \text{Aff} \\
| & & | \\
\textit{galalarrinyi-} & & \textit{-ni} \\
(\uparrow \text{ PRED}) = \text{`dog'} & & (\uparrow \text{ CASE}) = \text{ERG} \\
& & (\text{SUBJ } \uparrow)
\end{array}
$$

(16)

$$
f_x : \left[\text{SUBJ} \quad f' : \begin{bmatrix} \text{PRED} & \text{`dog'} \\ \text{CASE} & \text{ERG} \end{bmatrix} \right]
$$

Thus, in this analysis, a nominal inserted into the syntax already constructs its grammatical function by virtue of the case marker attached to it. In a dependent-marking nonconfigurational language, in which there are no argument functions assigned in the phrase structure, the information constructed by the case marker alone will therefore determine the grammatical function of the NP.

Following standard LFG assumptions (Simpson 1991, Kroeger 1993, Austin and Bresnan 1996, Bresnan 1996), I assume that the phrase structure for nonconfigurational languages is characterized by the presence of an exocentric, nonconfigurational category S. The basic c-structure that I assume for the Australian languages Warlpiri and Wambaya is in (17) (the auxiliary is in I) (Austin and Bresnan 1996, Nordlinger and Bresnan 1996). Nonconfigurational languages with no auxiliary (e.g. Jiwarli, Kayardild) consist simply of S.

(17)

Where C = X^0, NP.

$$
\begin{array}{ccc}
 & \text{IP} & \\
\overline{} \\
(\uparrow \text{ DF}) = \downarrow & & \uparrow = \downarrow \\
\text{XP} & & \text{I}' \\
& & \overline{} \\
& \uparrow = \downarrow & \uparrow = \downarrow \\
& \text{I} & \text{S} \\
& & | \\
& & (\uparrow (\text{GF})) = \downarrow \\
& & \text{C}^+
\end{array}
$$

There are no specific grammatical functions assigned within S. Rather, the grammar assigns the head relation ($\uparrow = \downarrow$) or the non-head relation (($\uparrow$ GF) $= \downarrow$) freely; the functions of the various constituents are determined by their morphology (Simpson 1991). Thus, a nominal with an ergative case marker, as above, will specify that it has the subject function, a nominal with locative case will construct an adjunct function, and so on. In this way, the intuition that the case morphology independently builds the syntax in these nonconfigurational languages is captured naturally. Note however, that this analysis of case marking is not dependent on the existence of nonconfigurational phrase structure. Since the mechanism involved is unification, there is nothing ruling out the encoding of grammatical relations elsewhere in the grammar, as well as in the case marking. Thus it is compatible with mixed head- and dependent- marking nonconfigurational languages, such as Warlpiri and Wambaya, in which grammatical relations can come both from the agreement markers in the auxiliary as well as from the case marking. And it is also compatible with more configurational languages, in which grammatical relations can also be determined by the phrase structure (e.g. Icelandic (Zaenen, Maling and Thráinsson 1985)). See Nordlinger (1997) for further discussion.

On this analysis case markers construct two different f-structures: one for which they provide a case feature (f' in (16)), and another for which they specify a grammatical function (f_x in (16)). We have seen in the examples in section 2 that these case markers interact with other pieces of inflectional morphology — case markers can appear on nominals already inflected for case, for example (2.3). Thus, we need a principle governing how the f-structure information carried by each morphological element is to be combined to result in a unified f-structure for the whole word. For this purpose, I propose a principle of morphological composition which ensures that each additional affix takes the outer f-structure constructed by the stem to which it attaches as its innermost f-structure; if it builds additional structure, this will then be outside of that built by the stem. In formal terms this means that the IO designator of the stem (which represents the outer f-structure constructed by the stem) is embedded within the function designator (including simply ↑) of the affix. For present purposes this can be formalized as in (18), in which the IO designator of the stem is substituted for any ↑ arrows in the affix (since these refer to the innermost f-structure constructed by the affix). The effect then is that the affix takes the stem's outermost f-structure as its innermost f-structure, and builds on top of it.

(18) **Principle of Morphological Composition:**
　　　Where x is a string of attributes:

$$\overbrace{(\text{GF}^n \uparrow)}^{\text{Stem}}\;\; \overbrace{((\text{GF}^m \;\; \uparrow)\;\; x)}^{\text{Aff}} \quad \Longrightarrow \quad \overbrace{(\text{GF}^n \uparrow)}^{\text{Stem}}\quad \overbrace{((\text{GF}^m\;(\text{GF}^n \uparrow))x)}^{\text{Aff}}$$

Note that this principle is formulated in such a way that it is only when the stem contains an IO designator that it has a non-vacuous effect. In the familiar cases, such as in (15) where the stem *galalarrinyi* constructs only a single f-structure (f' in (16)), the principle of morphological composition will apply vacuously; replacing the ↑ arrows of the affix with the ↑ arrows of the stem.

As we will now see, this analysis of case, coupled with the principle of morphological composition, provides a straightforward and intuitive account for all of the complex properties of case marking described in section 2 above.

3.1　Case Concord

Case agreement including that among discontinuous constituents follows automatically from this approach to case marking. Since case markers construct grammatical functions, co-referential nominals need to be inflected with the same case marker in order to have the same grammatical function. Consider the Wambaya example in (19). I assume it has the structure given in (20).

(19) *Galalarrinyi-ni bugayini-ni gini-ng-a*　　　　　*dawu*
　　　dog.I-ERG　　　big.I-ERG　　3SG.M.A-1.O-NFUT bite
　　　'The big dog bit me.'

(20)
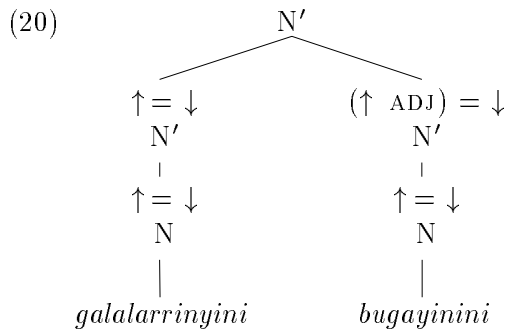
In this example the nominal *bugayini-* 'big' modifies *galarrinyi-* 'dog'. In Wambaya, as in many Australian languages (e.g. Dixon 1980), both nouns and adjectives belong to a single class of nominals, and most nominals can have either head or modifier functions. In order to capture this duality of functions, I assume that these nominals contain an optional (ADJ ↑) designator in their lexical entries: that is, they have the option of constructing the adjunct relation instead of the head relation. Thus, in this example, the information contributed by the modifier stem *bugayini-* is that in (21), constructing the f-structure in (22).

(21) a. *bugayini-*   (↑ PRED) = 'big'
                     (ADJ ↑)

     b. $\left[\text{ADJ}\quad \left[\text{PRED}\quad \text{'big'}\right]\right]$

As a result of the principle of morphological composition, the ergative case marker when added to *bugayini-* will contribute the information in (22), in which the ↑ arrows denoting the inner f-structure of the affix have been replaced with the IO designator (ADJ ↑) denoting the outer f-structure constructed by the stem. Thus, the ergative case marker builds structure on top of that already constructed by *bugayini-*: *bugayini-* constructs the ADJ relation (shown in (21b)), and the ergative case marker specifies that ADJ f-structure as belonging to a higher SUBJ f-structure. It combines with the stem as in (23), thereby constructing the f-structure given in (24) for the whole nominal.

(22)   *-ni:*   ((ADJ ↑) CASE) = ERG
                (SUBJ (ADJ ↑))

(23)

$$
\begin{array}{c}
\text{N } (f_1) \\
\end{array}
$$

      ↑ = ↓   ↑ = ↓
        N   Aff
     bugayini-   *-ni*
 (↑ PRED) = 'big'   ((ADJ ↑) CASE) = ERG
    (ADJ ↑)   (SUBJ (ADJ ↑))

(24)

$$
f_x : \left[\text{SUBJ}\quad f' : \left[\begin{array}{ll}\text{CASE} & \text{ERG} \\ \text{ADJ} & f_1 : \left[\text{PRED}\quad \text{'big'}\right]\end{array}\right]\right]
$$

This f-structure then combines with that constructed by the head nominal *galalarrinyini*, repeated in (25) from above,

(25)

$$
f_x : \left[\text{SUBJ}\quad f' : \left[\begin{array}{ll}\text{PRED} & \text{'dog'} \\ \text{CASE} & \text{ERG}\end{array}\right]\right]
$$

resulting in the f-structure given in (26) for the whole phrase.

(26)

$$
f_x : \left[\text{SUBJ} \quad f' : \left[\begin{array}{ll} \text{PRED} & \text{`dog'} \\ \text{CASE} & \text{ERG} \\ \text{ADJ} \quad f_1 : \left[ \text{PRED} \quad \text{`big'} \right] \end{array} \right] \right]
$$

On this analysis, the morphology constructs the same grammatical functions independently of the phrase structure. Thus, the same f-structure given in (26) is constructed irrespective of whether or not the two nominals are in the same phrase in the c-structure, or are discontiguous. Therefore, an advantage of this model of case marking is that case agreement between heads and modifiers follows automatically, whether they belong to the same c-structure phrase or not. If *bugayini-* were inflected with a different case marker in (19), for example, it would construct a different grammatical relation, and therefore be unified with a different grammatical function in the f-structure.

3.2 Case Stacking

The complex phenomenon of case stacking also follows automatically from this model of constructive case. Consider the example in (27) repeated from above.[8]

(27) *Ngayu   nhawu-lha tharnta-a*
     1SG.NOM saw-PST   euro-ACC

     mirtily-marta-a thara-ngka-marta-a.
     joey-PROP-ACC pouch-LOC-PROP-ACC
     'I saw the euro with a joey in its pouch.' (Martuthunira, Dench 1995a:60, ex.3.15)

I assume that the object NP has the structure given in (28),

(28)
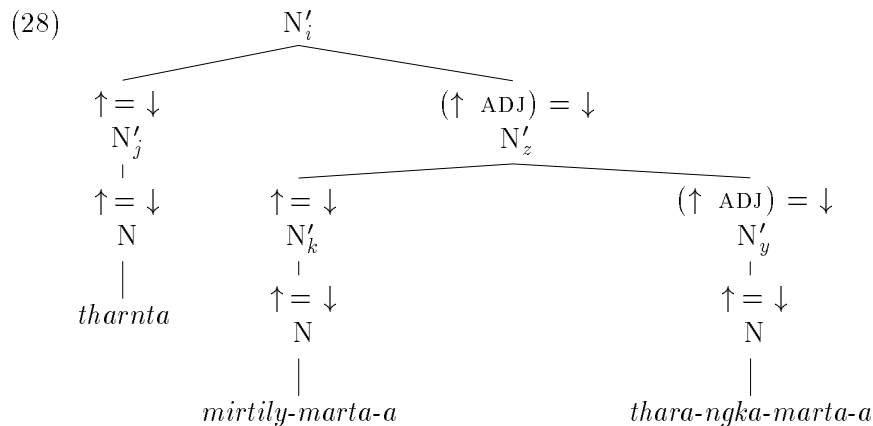
and that the various stems and affixes have the lexical entries given in (29) and (30).

(29) a.   *tharnta*: $(\uparrow$ PRED$)$ = 'euro'

      b.   *mirtily*: $(\uparrow$ PRED$)$ = 'joey'

      c.   *thara*: $(\uparrow$ PRED$)$ = 'pouch'

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[8]A 'euro' is a type of kangaroo and a 'joey' is a baby kangaroo.

(30) a.   *-a*:   ($\uparrow$ CASE) = ACC
              (OBJ $\uparrow$)

     b.   *-marta*:   ($\uparrow$ CASE) = PROP
                   (ADJ $\uparrow$)

     c.   *-ngka*:   ($\uparrow$ CASE) = LOC
                 (ADJ $\uparrow$)

The f-structure constructed by the head nominal is in (31) (exactly analogous to that we saw for *galalarrinyini* 'dog' in (25) above):

(31) *tharnta:*

$$\left[\text{OBJ} \quad \begin{bmatrix} \text{PRED} & \text{`euro'} \\ \text{CASE} & \text{ACC} \end{bmatrix} \right]$$

The adjunct nominal 'joey' constructs the f-structure in (32). Note that the accusative case marker in this case has embedded the structure built by the proprietive case marker due to the principle of morphological composition described earlier.

(32) N'_k – joey-PROP-ACC:

$$\left[\text{OBJ} \quad \begin{bmatrix} \text{CASE} & \text{ACC} \\ \text{ADJ} & \begin{bmatrix} \text{PRED} & \text{`joey'} \\ \text{CASE} & \text{PROP} \end{bmatrix} \end{bmatrix} \right]$$

And the most embedded nominal 'pouch', containing three case markers, constructs its context in the now familiar way. The proprietive case marker embeds the structure constructed by the locative case marker, as shown in (33); and the accusative case marker then embeds all of this structure, as in (34):

(33)   *-marta*:   (ADJ(ADJ $\uparrow$))
                    ((ADJ $\uparrow$) CASE) = PROP

(34)   *-a*:   (OBJ (ADJ(ADJ $\uparrow$)))
             ((ADJ(ADJ $\uparrow$)) CASE) = ACC

thus resulting in the f-structure given in (35) for the whole nominal. In this f-structure I have labelled the different f-structures for clarity: the locative case projects f-structures (1) and (2), the proprietive case projects f-structures (2) and (3), and the accusative case projects f-structures (3) and (4):

(35) N'_y – pouch-LOC-PROP-ACC:

$$4{:}\left[\text{OBJ} \quad 3{:}\begin{bmatrix} \text{CASE} & \text{ACC} \\ \text{ADJ} & 2{:}\begin{bmatrix} \text{CASE} & \text{PROP} \\ \text{ADJ} & 1{:}\begin{bmatrix} \text{PRED} & \text{`pouch'} \\ \text{CASE} & \text{LOC} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right]$$

Finally, these three f-structures (31, 32, 35) are unified into a single f-structure for the whole object NP. This is given in (36):

(36) N$'_i$

$$
\begin{bmatrix}
\text{OBJ} & \begin{bmatrix}
\text{PRED} & \text{`euro'} \\
\text{CASE} & \text{ACC} \\
& \begin{bmatrix}
\text{PRED} & \text{`joey'} \\
\text{CASE} & \text{PROP} \\
\text{ADJ} & & \begin{bmatrix}
\text{PRED} & \text{`pouch'} \\
\text{CASE} & \text{LOC}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

Thus, in the same way that we saw for case agreement, the complex properties of case stacking follow simply and inuitively from this model of constructive case.

3.3 Case and tense/aspect/mood

One of the fundamental ways in which this approach to case marking differs from more standard approaches is that it treats case markers as directly contributing information about the whole clause: the IO designator (SUBJ ↑) carried by an ergative case marker, for example, refers to the clause, specifying that it contains a SUBJ attribute with the value ↑. If it is true that case markers refer directly to the clause, then we might expect them to be able to provide other types of clausal information also, such as tense/aspect/mood. Thus, not only do case concord and case stacking follow naturally from this approach to case, but it provides a straightforward analysis for the use of case to mark tense/aspect/mood in languages like Kayardild as well. Consider the following example, repeated from above.

(37) *Ngada   yalawu-jarr yakuri-na   mijil-nguni-na.*
       I(NOM) catch-PST   fish-M.ABL net-INST-M.ABL
       'I caught fish with the net.' (Evans 1995a:108, ex. 3-30)

Case markers in this modal use do not function to construct grammatical functions, but appear to be a special type of tense/mood marker. I assume, therefore, that they should be treated in a way analogous to tense/mood markers on verbs, contributing a particular value for the attribute TENSE. For present purposes, I will represent this value as that of the case marker's prototypical use — e.g. ablative case will be treated as a marker of past tense.[9] Thus, the lexical entry of the ablative case in modal function is as in (38) (this will be slightly revised below).

(38)   *-na*:   (↑ TENSE) = PST

When this case marker is attached to a stem that contains an IO designator, such as the instrumental phrase *mijil-nguni-na* 'net-INST-M.ABL' in (37), morphological composition will result in the TENSE value in this lexical entry being unified into the f-structure of the clause. Thus, *mijil-nguni-na* has the morphological structure in (39), constructing the f-structure in (40). In (40), the outermost f-structure is that which corresponds to the whole clause.

---

[9]However, Evans (1995a) shows that the semantics of modal case is more complex than this suggests.

(39)

```
                               N
                ┌──────────────┴──────────────────┐
              ↑ = ↓                              ↑ = ↓
                N                                 Aff
         ┌──────┴──────────┐                       │
       ↑ = ↓             ↑ = ↓                    -na
         N                Aff            ((ADJ ↑) TENSE) = PST
         │                 │
       mijil-            -nguni-
   (↑ PRED) = 'net'      (ADJ ↑)
                       (↑ CASE) = INST
```

(40)
$$\begin{bmatrix} \text{TENSE} & \text{PST} \\ \text{ADJ} & \begin{bmatrix} \text{PRED} & \text{'net'} \\ \text{CASE} & \text{INST} \end{bmatrix} \end{bmatrix}$$

In order to account for the fact that modal case is attached directly to the stem of direct object NPs, as exemplified by *yakuri-* in (37), we need only to assume that it can optionally construct the grammatical relation of OBJECT. This can be captured for the modal ablative case by modifying the above lexical entry to include an optional OBJ, as in (41).

(41)   *-na*:   (((OBJ) ↑) TENSE) = PST

This now says that the ablative can either carry the information (↑ TENSE) = PST — as in (39) — or it can carry the information ((OBJ ↑) TENSE) = PST, in which case it provides a tense feature for the clause and constructs the OBJ relation for the nominal to which it is attached. When attached to a plain nominal stem such as *yakuri*, the modal case will construct the object relation, as in (42):

(42)
$$\begin{bmatrix} \text{TENSE} & \text{PST} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'fish'} \end{bmatrix} \end{bmatrix}$$

Thus, this analysis of modal case can straightforwardly account for its function to construct tense and mood information for the clause, as well as its appearance on object NPs, and on NPs that are already inflected with a case marker. The use of case marking to provide tense and mood information for the clause is extremely puzzling for standard views of case in which case markers do no more than contribute a case feature for their immediately containing NP. In contrast, as we have seen, this function is predicted by, and therefore follows naturally from, a model of constructive case.

4   Conclusion

Case morphology in these nonconfigurational Australian languages functions to construct the primary syntactic relations. In this paper I have shown that this constructive function of case can be modelled neatly with an analysis of case that makes use of inside-out function application in LFG to enable the case morphology to build the larger syntactic context in which it appears. This analysis of case marking allows for a straightforward and intuitive account of the function of case

in dependent-marking nonconfigurational languages to construct the grammatical relations for the clause. Furthermore, properties of case marking that are potentially problematic for other formal analyses of case, such as case stacking, and the use of case to mark tense/aspect/mood follow naturally from this constructive approach.

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