

**FROM JUXTAPOSITION TO INCORPORATION:
AN APPROACH TO GENERIC-SPECIFIC CONSTRUCTIONS**

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Abstract

In this paper, we present an analysis of classifier noun incorporation in Gunwinyguan languages from northern Australia, focussing particularly on generic specific constructions. We show how the analysis of Sadler and Nordlinger (2006) for generic-specific constructions forms through nominal juxtaposition can be extended to account for incorporated generic-specific constructions also. In this analysis, each nominal (or incorporated noun) is treated as belonging to a set at f-structure, on a par with the standard LFG treatment of coordination. The difference between the various set-based constructions (including coordinations, generic-specific constructions and part-whole constructions) arises in the mapping to the semantic structure. We show how this provides a single unified analysis for all generic-specific constructions in these languages, whether incorporated or juxtaposed. In doing so, we provide the first LFG analysis of classifier incorporation with doubling.

1 Introduction

Sadler and Nordlinger (2006) (henceforth SN06) discusses a range of uses of nominal juxtaposition in various Australian languages in which a single syntactic structure is common to a range of different construction types, including coordination, generic-specific and part-whole constructions, and hence associated with a number of different semantic interpretations. This paper presents an analysis in which these uses of nominal juxtaposition are treated as having a single set-based syntactic structure with the different interpretations arising in the mapping to the semantics. In polysynthetic Australian languages, many of these same construction types (especially generic-specifics and part-whole constructions) may also be formed through noun incorporation, with one of the nominals incorporated into the verb and the other nominal (optionally) expressed externally in the syntax. In the descriptions of these languages, the incorporated version is argued to be equivalent to the phrasal incarnation (e.g. Evans 1996, 2003), both functionally and in terms of relational syntax, despite the evident differences in ‘expression structure’. Noun incorporations of this sort are not accounted for by previous LFG approaches to (classifier) noun incorporation (e.g. Manning 1996, Bresnan 2001, Mohanan 1995), since the external nominal is not a modifier of the incorporated nominal and so a PRED clash in the f-structure should result once the f-structure of the external nominal is unified with the f-structure associated with the nominal incorporated into the verb. In this paper, we show how the SN06 approach can be extended to account for these incorporated examples also, thereby providing an integrated analysis of these construction types across Australian languages, and also the first LFG account of classificatory noun incorporation with NP doubling.

2 Sadler and Nordlinger 2006

SN06 argue that nominal juxtapositions covering a range of interpretations essentially share a single syntax, so that part-whole constructions, generic-specifics, nominal-nominal appositions and coordinations share a common set-based representation. Consider the following examples of a generic-specific (1) and a part-whole (2) from Kayardild:

- (1) *Dathin-a dangka-a niya wumburung-kuru raa-ja wanku-ya kulkiji-y.*
that-NOM man-NOM 3SG.NOM spear-PROP spear-ACT elasmobranch-MLOC shark-MLOC

[†]We are grateful to Avery Andrews, Brett Baker and Mary Dalrymple and the audience at LFG08 for comments and suggestions.

‘That man speared a shark with a spear.’

(Evans, 1995, 244: Kayardild)

(2) *kawuka jardiyali*

bundle fighting.stick

‘a bundle of fighting sticks’

(ibid, 249: Kayardild)

In SN06 we treated these juxtaposed part-whole and generic-specific constructions as sets at f-structure, as in (3) and (4).

$$(3) \left[\begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \\ \left(\left[\begin{array}{l} \text{PRED 'ELASMOBRANCH'} \\ \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \end{array} \right] \right) \\ \left(\left[\begin{array}{l} \text{PRED 'SHARK'} \\ \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \end{array} \right] \right) \end{array} \right]$$

$$(4) \left[\begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \\ \left(\left[\begin{array}{l} \text{PRED 'BUNDLE'} \\ \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \end{array} \right] \right) \\ \left(\left[\begin{array}{l} \text{PRED 'FIGHTING.STICK'} \\ \text{INDEX} \left[\begin{array}{l} \text{NUM SG} \\ \text{PERS 3} \end{array} \right] \end{array} \right] \right) \end{array} \right]$$

On the view proposed in SN06, the f-structure representation of these different construction types is essentially the same, differing only in the overall INDEX feature of the set itself. In coordinate structures, the the INDEX features of the set are the set union of the INDEX features of the coordinands, following the proposal of Dalrymple and Kaplan (2000) for syntactic resolution. In generic-specific and part-whole constructions, on the other hand, the INDEX features of the set are not resolved, but are generally identified with the members of the set.¹ This is reflected in the following phrase structure rule for non-coordinated N-N juxtapositions, in which the agreement constraints are stated in the template ‘NP-APPOS’ given in (6) (see Dalrymple et al. (2004) on the use of templates to capture linguistic generalizations):

$$(5) X \longrightarrow \begin{array}{cc} X & X \\ \downarrow \in \uparrow & \downarrow \in \uparrow \\ @\text{NP-APPOS} & @\text{NP-APPOS} \end{array}$$

appos

¹This assumption is a slight oversimplification in that we abstract away from several nitty-gritty issues here. In particular, there are a number of open questions concerning GENDER in generic-specific and part-whole constructions, and concerning the analysis of ‘possessive’ part-whole constructions. See SN06 for some discussion.

(6) NP-APPOS: $(\downarrow \text{IND}) = (\uparrow \text{IND})$

Given their c-structure identity, and their essentially identical f-structure representation, the primary distinction between coordination on the one hand, and appositions (including generic-specifics and part-wholes) on the other, emerges in the semantics. In SN06 we modelled the semantics of nominal apposition on the semantics of nominal modification, where each nominal introduces a property, that is a restriction over the (nominal) variable.^{2,3}

(7) **appos** $\lambda Q.\lambda P.\lambda x.Q(x) \wedge P(x)$:
 $[(\% \text{NOM1}_\sigma \text{ VAR}) \multimap (\% \text{NOM1}_\sigma \text{ RESTR})] \multimap$
 $[[(\% \text{NOM2}_\sigma \text{ VAR}) \multimap (\% \text{NOM2}_\sigma \text{ RESTR})]$
 $\multimap [(\uparrow_\sigma \text{ VAR}) \multimap (\uparrow_\sigma \text{ RESTR})]]$
 $\% \text{NOM1} \in \uparrow$
 $\% \text{NOM2} \in \uparrow$

On the meaning side, this is a function which applies to two nominal $\langle e, t \rangle$ meanings and produces an abstraction over a logical conjunction of predications holding of this individual (so it takes two nominal meanings and produces a nominal meaning, where nominal meanings are of type $\langle e, t \rangle$). On the glue side the meaning constructor consumes one nominal contribution and then the other nominal contribution to produce the meaning of the structure as a whole. Note that the meaning which results from this process is a nominal meaning, that is a property or function of type $\langle e, t \rangle$, rather than a generalized quantifier or typical DP meaning. This meaning cannot be of course be consumed directly by the verbal meaning constructor (given standard assumptions about the latter), but must be type-shifted to produce a full referential NP meaning. This is consistent with the fact that in these languages a bare nominal may be interpreted predicatively, but may also be interpreted as a full NP in context.

In order to illustrate how the analysis comes together, we begin with a straight-forward nominal apposition, in which two nominals specifying the same referent are juxtaposed in a single NP. The lexical entries are shown in (9) and (10).

(8) *Garidi-ni bungmanyi-ni gin-amany yanybi.*
 husband.I-ERG old.man.I-ERG 3SG.M.A-P.TWD get
 ‘(Her) old man husband came and got (her).’ (Nordlinger, 1998, 133: Wambaya)

(9) *garidi-ni* (husband.I-ERG):

$\lambda x.husband(x): (\uparrow_\sigma \text{ VAR}) \multimap (\uparrow_\sigma \text{ RESTR})$

²Some caveats are in order here. The approach that we propose is intended for nominal appositions as they occur in the languages we are concerned with, and should not be interpreted as a proposal for treating apposition in general crosslinguistically. Unlike the constructions we focus on, many structures called appositions in the literature seem to be best understood as (non-restrictive) parentheticals. One view of parenthetical material, which has gained considerable currency, is that such material is not integrated into the truth conditional semantics at all but are as conventional implicatures (Potts, 2005). Amongst those ‘appositional’ structures which *are* integrated, rather than orphaned, in many languages what you see is apposition at the level of NP, which does not immediately suggest an approach at the level of properties. Nonetheless, there are approaches to nominal apposition in the literature which are closer to the sort of approach we adopt: we note that Doron (1992) treats non-restrictive NP appositions as properties and our treatment has quite a bit in common with the spirit of the approach to close apposition and polydefinites in Modern Greek in Marika Lekakou and Kriszta Szendrői (2007) which uses syntactic R role identification.

³The formulation in (7) corrects a technical inaccuracy in the statement in SN06 by using local names ($\% \text{NOM1}$ and $\% \text{NOM2}$) to refer to the members of the set of f-structures.

(10) *bungmanyi-ni* (old.man.I-ERG):

$$\lambda x. old.man(x): (\uparrow_{\sigma} \text{VAR}) \multimap (\uparrow_{\sigma} \text{RESTR})$$

The meaning constructor (7) consumes (9) and (10) to produce another nominal meaning:

(11) *garidi-ni bungmanyi-ni* (husband.I-ERG old.man.I-ERG):

$$\lambda x. [old.man(x) \wedge husband(x)]: \\ (\uparrow_{\sigma} \text{VAR}) \multimap (\uparrow_{\sigma} \text{RESTR})$$

For the juxtaposed generic-specific construction in (1), the semantic information associated with the lexical items is given in (12) and (13), the result of combination in (14) and the f-structure in (15).

(12) *wanku-ya* (elasmobranch.MLOC): $\lambda x. elasmobranch(x): (\uparrow_{\sigma} \text{VAR}) \multimap (\uparrow_{\sigma} \text{RESTR})$

(13) *kulkiji-y* (shark.MLOC): $\lambda x. shark(x): (\uparrow_{\sigma} \text{VAR}) \multimap (\uparrow_{\sigma} \text{RESTR})$

(14) *wanku-ya kulkiji-y* (elasmobranch-MLOC shark-MLOC)

$$\lambda x. elasmobranch - fish(x) \wedge shark(x): (\uparrow_{\sigma} \text{VAR}) \multimap (\uparrow_{\sigma} \text{RESTR})$$

(15)
$$\left[\begin{array}{l} \text{INDEX} \left[\begin{array}{ll} \text{NUM} & \text{SG} \\ \text{PERS} & 3 \end{array} \right] \\ \left\{ \left[\begin{array}{ll} \text{PRED} & \text{'ELASMOBRANCH'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{NUM} & \text{SG} \\ \text{PERS} & 3 \end{array} \right] \end{array} \right] \right\} \\ \left\{ \left[\begin{array}{ll} \text{PRED} & \text{'SHARK'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{NUM} & \text{SG} \\ \text{PERS} & 3 \end{array} \right] \end{array} \right] \right\} \end{array} \right]$$

In the case of the generic-specific constructions, there is an additional relationship between the properties that the nominal predicates introduce, in that one (the ‘generic’ term) is (typically) a hypernym whose reference properly includes that of the other (‘specific’) term. We abstract away from this here but we think this could be captured by an additional meaning postulate specifying that an appropriate relationship must hold between the two nominal restrictor properties.

To summarize, on this approach we capture the syntactic similarities between these construction types which are expressed by means of simple juxtaposition at c-structure, by modelling all of them using sets at f-structure: neither nominal heads the combined phrase. The account captures the semantic differences by specifying different mappings from the f-structure to the semantic structure for the different construction types.

3 From Juxtaposition to Incorporation

Many polysynthetic languages also allow the expression of part whole and generic-specific constructions through nominal incorporation (i.e. in the morphology), as well as by means of nominal juxtapositions in the syntax. Nominal incorporation (NI) of this type is found in a number of northern

Australian languages, including Bininj Gun-Wok (Evans, 2003), Ngalakgan (Baker, 2008), Wubuy (Heath 1984), among others. Here we present data from Bininj Gun-wok, for which the phenomenon is most thoroughly described.

The following examples demonstrate incorporated generics in generic-specific constructions. In Bininj Gun-wok (and in other northern Australian languages) generic incorporation is possible with only a small subset of nominals. Evans (2003) reports that there are approximately 60 nouns in Bininj Gun-wok that are incorporated in this way. Some of these have suppletive forms: e.g. *bo-* is the Gun-djeihmi incorporated form for ‘water, liquid’, but the external nominal is *gukku* (Evans 2003: 332).⁴ Crosslinguistically, it is quite common for the phonological shape of incorporated nominal stems to differ quite substantially from their free form counterparts, and this in itself would seem to constitute quite a strong argument for the lexicalist over the syntactic approach to noun incorporation. As we show below, there is clear evidence that the incorporated nominal is syntactically active in the languages which we focus on here.

- (16) *Ga-rrulk-di an-dubang/an-berbern*
 3-tree-stand.NP VEG-ironwood.tree/VEG-ghostgum
 An ironwood/ghostgum tree is there. (Evans, 2003, 334)

- (17) *Ba-bo-yakm-inj gukku / gun-gih / an-bang*
 3P-liquid-disappear-PP water / NEUT-mud / VEG-grog
 ‘The water/mud/grog is all gone’ (ibid, 334)

- (18) *Warramurrungundji Ø-dulk-wakwam ngalengarre kun-barlkbu*
 [name] 3/3P-stick-forgotPP her NEUT-digging.stick
 ‘Warramurrungundji forgot her digging stick.’ (ibid, 452)

Below, we see examples in which the part is incorporated in part-whole constructions.

- (19) *Makkakurr ba-rrang-danjbo-n djenj*
 pelican 3/3-mouth-spear-PI fish
 ‘The pelican “speared” the fish in the mouth’⁵ (ibid, 455)

- (20) *Abanmani-bid-garrme-ng daluk*
 1/3du-hand-grasp-PP woman
 ‘I grabbed the two women by their hands.’ (ibid, 458)

In terms of Rosen’s (Rosen, 1989) typology of noun incorporation, there is substantial evidence that what we are dealing with here is best classified as non-valency reducing or classifier incorporation. Rosen’s typology makes a fundamental distinction between two types of NI, *Compounding* and *Classifier*. The major criterion for establishing the distinction between these types of NI is whether

⁴As in all languages with incorporation of this kind, there are a number of discourse and pragmatic based restrictions on what type of nominal can be incorporated, and when incorporation may or may not be preferred over the alternative non-incorporated equivalent (see, for example, Mithun 1984 for general discussion, and Evans 2003 for discussion specific to Bininj Gun-Wok). Since these are not issues relevant to the core morphosyntax of the constructions, we abstract away from such issues here.

⁵Evans (2003:455) notes explicitly that the incorporated nominal cannot be referring to the pelican’s mouth here, since it can never be construed with the transitive subject.

or not the incorporated argument is syntactically visible: in cases of Compounding NI there is valency reduction and (for Rosen) there is no structural representation of the incorporated nominal in the syntax. Classifier NI, on the other hand, does not involve valency reduction.⁶

The most prototypical examples of NI involve the incorporation of the noun stem corresponding to the OBJ of a transitive verb, but some languages also permit incorporation of SUBJ arguments (most often of Unaccusative predicates) and there are also cases of ADJUNCT incorporation in the literature.

There are several further distinctions which can be established between various different cases of classifier NI. Rosen takes the most canonical instance of classifier NI to be exemplified by Mohawk, which permits external doubling of the incorporate by an NP, and also (stranded) external modifiers of the NI. The following example shows a case of doubling.

- (21) *shakoti-ya't-í:sak-s ne ronú:kwe*
 they/them-body-seek-ing the they.MPL.person
 They were looking for the men (Mithun, 1984, 864: Mohawk)

Much of the LFG discussion of classifier NI has been about West Greenlandic, which is a language which allows only stranding of modifiers (of the nominal) but not doubling.⁷

- (22) a. *Suulut ataatsi-mik ammassat-tor-poq*
 Suulut.ABS one-MOD sardine-eat-IND.3SG
 Suulut ate one sardine
 b. *Tuttu-p neqi-tor-pu-nga*
 reindeer-GEN meat-eat-IND-1SG
 I ate reindeer meat (Manning 1996, 118: West Greenlandic)

Mohanan (1995, 1994) argues that Hindi provides an example of a language with classifier NI in which neither doubling NPs nor external modifiers are permitted: a major plank in her argument that Hindi does indeed have classifier NI (as opposed to some sort of valency-reducing or compounding NI) comes from the fact that the incorporate controls agreement, and Wescoat (2002) discusses dialects of Hindi in which NI does permit modifier stranding.

- (23) *anil kitaabē beceгаа*
 Anil-NOM(M) book-NOM-PL(F) sell-FU.M.SG
 Anil will do book selling (Mohanan 1994, 106: Hindi)

A further way in which languages with NI may differ concerns the interpretation of the incorporate itself. In Hindi, as indicated by the translation above, the incorporated noun receives what Mohanan calls a 'generic' interpretation, in that it fails to refer to any (specific) book or books. In other languages, for example Southern Tiwa and Nahuatl (modifier stranding, no doubling) and Mohawk (doubling), the incorporate may be interpreted referentially, as for example in the Mohawk example (24) in which reference is made to a specific indefinite (Anderson, 2000).

⁶Mithun's (Mithun, 1986, 1984) well-known four-way classification takes into account various discourse functions of NI: three of Mithun's subtypes fit into Rosen's Compounding NI. See Rosen (1989) and also Wescoat (2002) for further discussion.

⁷As frequently noted in the literature, the process in West Greenlandic is quite non-canonical (at least morphologically) in that for the verbs in question the process is obligatory, suggesting an analysis closer to denominal verbalization rather than stem-compounding, although of course many of the same issues concerning syntactic valency are relevant.

(24) *Kanekwarúnyu wa'-k-akya'tawi'tsher-ú:ni*

it.dotted.DIST PAST-I-dress-make

I made a polka-dotted dress

(Anderson, 2000, 12: Mohawk)

As extensively argued by Evans (2003) for Biniñ Gun-wok, the evidence is strong that these languages show classifier NI: the agreement data suggests that the syntactic valency of the verb remains unchanged irrespective of whether or not the object nominal is external (25a) or incorporated (25b); and the incorporated nominal can be externally modified (26) or doubled (27). As is evident from at least some of the examples in this paper, such as (18), NI in these languages does not preclude referentiality in these languages.

(25) a. *Barri-ngune-ng gun-ganj*

3a/3P-eat-PP IV-meat

'They ate the meat.'

(Evans (2003, 330))

b. *Barri-ganj-ngune-ng.*

3a/3P-meat-eat-PP

'They ate the meat.'

(Evans, 2003, 330)

(26) *Ga-yau-garrme al-daluk.*

3-child-haveNP FE-woman

'She has a female child.'

(Evans, 2003, 452)

(27) *na-marrgon an-djal-dulk-gudji ga-rrulk-do-ng*

MASC-lightning VEG-only-tree-one 3-tree-strike-NP

'Lightning always strikes just that one tree.'

(Evans, 2003, 178)

Despite the differences in morphosyntactic structure, these incorporated generic-specific and part-whole constructions are functionally analogous to the appositional (juxtaposed) equivalents. Evans (2003, 450) notes that noun incorporation in Biniñ Gun-Wok is "grammatically optional" and thus there exist "near-synonymous alternatives" in which the noun root appears as an external nominal. The following examples demonstrate this for generic-specific constructions.

(28) a. **An-barnadja** **an-mim** *ngarri-bowo-ni*

VEG-owenia:vernicosa VEG-fruit 1a-put.in.water-PI

'We used to put the owenia vernicosa fruit in the water (to poison the fish).'

(Evans, 1996, 73)

b. **An-barnadja** *ngarri-mim-bowo-ni*

VEG-owenia:vernicosa 1a-fruit-put.in.water-PI

'We used to put the owenia vernicosa fruit in the water (to poison the fish).'

(ibid)

Evans (1996, 2003) argues extensively that both generic-specific constructions and part-whole constructions have the same appositional syntax irrespective of whether or not one of the nominals is incorporated: "[i]t is possible to incorporate one of the apposed pair, for discourse purposes, but this does not alter the basic appositional argument structure." (p. 89) In the interests of time and space,

we will focus in this paper on generic-specific constructions. However, we assume that part-whole incorporation will also be accounted for under this general approach.⁸

This functional similarity between incorporated and juxtaposed constructions is captured straightforwardly by extending the SN06 account of nominal juxtapositions to allow for set membership to also be constructed from the morphology, as we show in section 5 below. But first, we provide a brief overview of previous LFG approaches to noun incorporation and show that none of these are adequate to account for the Bininj Gun-wok data.

4 Previous LFG Accounts of NI

Previous accounts of noun incorporation in LFG do not account for the Bininj Gun-wok incorporation facts since they are either specific to valency-reducing noun incorporation (Ball, 2004; Asudeh, 2007; Duncan, 2007), or have no way of accommodating non-modifier doubling (as in examples (16)-(18), and (27) above) (Mohan, 1995; Manning, 1996; Bresnan, 2001; Wescot, 2002). There is no previous LFG treatment of classifier NI with doubling.

4.1 Accounts of Valency Preserving NI

In LFG accounts of valency-preserving noun incorporation, the incorporated nominal heads and introduces a grammatical function (GF) – normally an OBJ (though as noted above, in some languages unaccusative SUBJ and also some ADJ are found morphologically incorporated). Any modifiers (or possessors) appear within the (headless) NP. The following treatment of West Greenlandic from Manning (1996) will serve to exemplify the general approach, though the GF is question is taken to be OBL not OBJ in this account (and note also that *morphologically* what seems to be involved is denominal verbalization rather than stem compounding). The NP rule in (29) has slots for the stranded ADJUNCT and POSS (‘one’ and ‘reindeer’ respectively in (22)).

$$(29) \text{ NP} \longrightarrow \begin{array}{ccc} (\text{NP}) & (\text{N}) & (\text{NP}) \\ (\uparrow \text{POSS}) = \downarrow & \uparrow = \downarrow & (\uparrow \text{ADJ}) = \downarrow \\ & & (\uparrow \text{CASE}) = \downarrow \\ & & (\uparrow \text{NUM}) = (\downarrow \text{NUM}) \end{array}$$

$$(30) \text{ V}^{-1} \longrightarrow \begin{array}{cc} \text{N}_{stem} & \text{Aff}_{vrblz} \\ (\uparrow \text{OBL}_{mod}) = \downarrow & \uparrow = \downarrow \end{array}$$

$$(31) \text{ -tor: Aff}_{vrblz} \quad (\uparrow \text{PRED}) = \text{use/eat} < (\uparrow \text{PIVOT}) (\uparrow \text{OBL}_{mod}) > \\ (\uparrow \text{OBL}_{mod} \text{ CASE}) = \text{MOD}$$

On this approach, the incorporated nominal contributes the PRED of the GF (here OBL but more generally, OBJ) directly, with external modifiers contributing information to the same f-structure. A problem would arise, of course, when the external nominal is not a modifier but a doubling head (as in the generic-specific and doubling constructions above), since in this case the external nominal may also contribute a PRED feature to the same GF, resulting in a feature clash. Similar issues would

⁸It is worth noting that Evans (2003:325) states that it is possible for the same incorporated nominal to be interpreted as either the part in a part-whole construction, or the generic in a generic-specific construction, lending weight to our general approach which treats these constructions as identical in the f-structure, with the differences in interpretation arising in the semantics.

arise in other accounts: for example Mohanan (1995)'s account of Hindi NI which treats the NI = V combination as a morphological unit projecting both the verb's and an OBJ f-structure. In sum, existing LFG accounts of classifier NI cannot deal adequately with valency-preserving NI with doubling, as we see in Biniw Gun-wok, such as is found in the Gunwinyguan languages.

4.2 Accounts of Valency Reducing NI

Other LFG analyses of NI in various languages focus in fact on valency-reducing (compounding) rather than classifier NI hence are not relevant in terms of the f-structure assumptions that they make, because the incorporate is not a syntactic argument. Nonetheless, we briefly discuss here the proposal of Asudeh and Ball (2005), outlined in Asudeh (2007), which is of particular interest because it makes a specific proposal in relation to the semantic interpretation of the case of valency-reducing NI in Niuean it is concerned with, while the LFG literature on classifier NI is very largely concerned only with the syntax.

The basic elements of this approach are as follows. In (32) the string *kofe* 'coffee' is an incorporated nominal: although it is a separate word in the syntax, it must appear in this verb-adjacent position and the case marking reflects the intransitive nature of the clause (case marking in Niuean follows an ergative-absolutive pattern).

- (32) *Ne inu kofe a Sione.*
 PAST drink coffee ABS Sione
 Sione drank coffee

The incorporate is integrated into the semantics but is not a syntactic argument (i.e. a subcategorised GF). Rather, it appears in the f-structure as a new GF, labelled INCORPORATE. In terms of c-structure, Asudeh and Ball (2005) treat the incorporated element as a non-projecting word. These elements of the approach are captured in the following c-structure rule. The f-structure for (32) is given in (34).

- (33) $V^0 \longrightarrow \begin{matrix} V^0 \\ \uparrow = \downarrow \end{matrix} \quad \begin{matrix} \hat{N} \\ (\uparrow \text{ INCORPORATE}) = \downarrow \\ (\uparrow_{\sigma} \text{ ARG}) = \downarrow_{\sigma} \end{matrix}$

- (34) $\left[\begin{array}{l} \text{INCORP} \left[\text{PRED} \text{ 'COFFEE'} \right] \\ \text{PRED} \text{ 'DRINK< SUBJ>'} \\ \text{SUBJ} \left[\begin{array}{l} \text{PRED} \text{ 'SIONE'} \\ \text{CASE} \text{ ABS} \end{array} \right] \end{array} \right]$

A lexical process takes a normal transitive verb and makes of it an incorporating verb - from (35) to (36) - reducing the valency of the verb stem. The verbal meaning constructor in the lexical entry which is the output of this lexical rule, that is, (36) is one which will consume a nominal meaning to create a function from the SUBJ meaning to the meaning of the sentence. That is, it will consume a nominal meaning to create a standard intransitive verb meaning. A lexical rule also applies to make \hat{N} (non-projecting N) from common noun N, without changing their semantics: as the (partial) lexical entry in (37) shows, the (incorporated) nominal has the normal nominal (N) meaning constructor.

- (35) *-inu*: $V \quad (\uparrow \text{ PRED}) = \text{drink} \langle (\uparrow \text{ SUBJ}) (\uparrow \text{ OBJ}) \rangle$
 $\lambda x \lambda y. \text{drink}(x, y): (\uparrow \text{ SUBJ}_{\sigma}) \multimap (\uparrow \text{ OBJ}_{\sigma}) \multimap \uparrow_{\sigma}$

$$(36) \text{-inu: } V \quad (\uparrow \text{ PRED}) = \text{drink} \langle (\uparrow \text{ SUBJ}) \rangle \\ \lambda P \lambda x. \exists y [\text{drink}(x, y) \wedge P(y)]: \\ [(\uparrow_{\sigma} \text{ ARG VAR}) \multimap (\uparrow_{\sigma} \text{ ARG RESTR})] \multimap [(\uparrow \text{ SUBJ}_{\sigma}) \multimap \uparrow_{\sigma}]$$

$$(37) \text{kofe: } \hat{N} \quad \lambda x. \text{coffee}(x): (\uparrow_{\sigma} \text{ VAR}) \multimap (\uparrow_{\sigma} \text{ RESTR})$$

On the meaning side of the meaning constructor, the meaning expression abstracts over the property which the incorporate introduces, and also uses existential closure (of the entity restricted by the nominal property expressed by the incorporate, here ‘coffee’), in a manner reminiscent of van Geenhoven (1998)’s semantic approach to incorporation and narrow scope indefinites, to close off this argument to further saturation (ie through doubling), following a suggestion in Chung and Ladusaw (2003).⁹

Finally, some modifiers may occur with an incorporated noun in Niuean (as in (38)) and these are separately introduced in the c-structure under the NP in the rule (39). (40) is a partial lexical entry showing the standard semantics for the modifier *kono* ‘bitter’.

$$(38) \text{Ne inu kofe kono a Sione} \\ \text{PAST drink coffee bitter ABS Sione} \\ \text{Sione drank bitter coffee}$$

$$(39) \text{S} \quad \longrightarrow \quad \begin{array}{ccc} \text{V}^0 & \text{NP} & \text{KP}^+ \\ \uparrow = \downarrow & (\uparrow \text{ INCORPORATE}) = \downarrow & (\uparrow \text{ GF}) = \downarrow \end{array}$$

$$(40) \text{kono: } \hat{N} \quad \lambda P \lambda x. P(x) \wedge \text{bitter}(x): \\ [((\text{ADJ} \in \uparrow)_{\sigma} \text{ VAR}) \multimap ((\text{ADJ} \in \uparrow)_{\sigma} \text{ RESTR})] \multimap \\ [((\text{ADJ} \in \uparrow)_{\sigma} \text{ VAR}) \multimap ((\text{ADJ} \in \uparrow)_{\sigma} \text{ RESTR})]$$

Finally, note that though the issue is not addressed in Asudeh (2007), the approach to the f-structure and semantics of valency-reducing NI does not appear to hinge critically on the syntactic nature of the incorporate and its treatment as a non-projecting word, and could in principle be extended to more ‘standard’ cases of morphological incorporation.

5 Our Proposal

Our approach to the semantics has some aspects in common with the approach above, and indeed most approaches to the semantics of NI view it (grossly) in terms of introducing a nominal restriction (or its equivalent) over the semantic argument (van Geenhoven, 1998; Chung and Ladusaw, 2003; Farkas and de Swart, 2003).¹⁰

In this section we demonstrate how the SN06 analysis of juxtaposed nominal constructions can be extended to generic noun incorporation constructions, thereby (i) providing an LFG account of classifier NI that can deal with doubling with an external (non-modifier) nominal; and (ii) capturing the functional equivalence between these constructions and the analogous juxtaposed constructions by providing a unified account. The proposal developed here is preliminary in many respects, and

⁹As Asudeh (2007) notes, alternative ways of closing off this argument would be appropriate in cases where the incorporate is not referential.

¹⁰This is not, of course, to deny that there are significant differences between all these various accounts: see Farkas and de Swart (2003) for an illuminating comparison of a number of approaches.

a number of questions and avenues for investigation are left for future work. Our approach builds directly on the idea that the following are fundamentally equivalent at the f-structure level:¹¹

- (41) a. **An-barnadja** **an-mim** *ngarri-bowo-ni*
 VEG-owenia:verniosa VEG-fruit 1a-put.in.water-PI
 ‘We used to put the owenia verniosa fruit in the water (to poison the fish).’ (Evans (1996, 73))
- b. **An-barnadja** *ngarri-mim-bowo-ni*
 VEG-owenia:verniosa 1a-fruit-put.in.water-PI
 ‘We used to put the owenia verniosa fruit in the water (to poison the fish).’ (Evans (1996, 73))

The common f-structure is as follows (but note that the incorporated nominal does not encode noun class morphologically). For present purposes we simplistically flag the ‘generic’ semantics of the incorporated nominal in the PRED value. Note that it is the more general term which incorporates. In this connection Anderson (2000) observes that crosslinguistically languages which permit doubling always permit a *more specific* external doubling NP, and many permit a doubling NP which is as specific or synonymous with the incorporated nominal, but none seem to permit the equivalent of **John trout-caught a fish* in which the more specific term is incorporated. We adopt his view that: “These facts appear to result from a requirement (semantic or pragmatic, depending on one’s view of where the line between these is to be drawn) that overt expressions be at least minimally informative with respect to the information already provided by the Verb’s semantics..... Languages apparently differ on the basis of whether they consider an essentially equivalent expression ‘informative’ or not (perhaps by virtue of the possibility it introduces of independent referentiality).”(Anderson, 2000, 135)

$$(42) \left[\begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \\ \left\{ \begin{array}{l} \left[\begin{array}{l} \text{PRED} \quad \text{'OWENIA.VERNICOSA'} \\ \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \end{array} \right] \\ \left[\begin{array}{l} \text{PRED} \quad \text{'FRUIT (GENERIC)'} \\ \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \end{array} \right] \end{array} \right\} \end{array} \right]$$

Set membership for the external nominal is determined by the c-structure annotations, just as for the juxtaposed versions: NP nodes in the syntax are annotated (\uparrow GF) = \downarrow | $\downarrow \in$ (\uparrow GF), an annotation which also accounts for the occurrence of syntactically discontinuous appositional structures.

An incorporated nominal may or may not be doubled by an external nominal — (25b) above, repeated here as (43) exemplifies the latter circumstance.

¹¹As noted above, there are likely pragmatic and discourse differences between the two, but we abstract away from these here.

(43) *Barri-ganj-ngune-ng.*

3a/3P-meat-eat-PP

‘They ate the meat.’

(Evans, 2003, 330)

An incorporated nominal therefore *optionally* constructs a set for the OBJ, as shown in the extract below from the lexical entry for a fully inflected verb:¹²

(44) *-mim-bowo-* (↑ PRED) = ‘put.in.water< (SUBJ)(OBJ)>’
 $\lambda x \lambda y. put.in.water(x, y): (\uparrow SUBJ)_\sigma \multimap (\uparrow OBJ)_\sigma \multimap \uparrow_\sigma$
 (↑ OBJ (ε)) = ↓
 (↓ PRED) = ‘fruit (generic)’
 (↓ INDEX PERS) = 3
 (↓ INDEX NUM) = SG
 (↓ INDEX GEND) = VEG
 $\lambda x. fruit(x): (\downarrow_\sigma VAR) \multimap (\downarrow_\sigma RESTR)$

According to this lexical entry, the incorporated nominal can either provide the PRED for the OBJ (i.e. when there is no external nominal), or it can provide the PRED for one member of a set-valued OBJ (i.e. when there is an external nominal). To illustrate, we begin with a case of (straightforward) NI:

(45) *Al-ekge al-gohbanj ba-gurlah-bimbu-ni*

FE-DEM II-old.person 3/3PL-skin-paint-PI

That old lady used to paint (buffalo) hides

(Evans (2003, 451))

The lexical information associated with the verb stem plus incorporated nominal is as follows, producing the associated f-structure in (47):

(46) *-gurlah-bimbu-* (↑ PRED) = ‘paint< (SUBJ)(OBJ)>’
 $\lambda x \lambda y. paint(x, y): (\uparrow SUBJ)_\sigma \multimap (\uparrow OBJ)_\sigma \multimap \uparrow_\sigma$
 (↑ OBJ) = ↓
 (↓ PRED) = ‘skin’
 (↓ INDEX PERS) = 3
 $\lambda x. skin(x): (\downarrow_\sigma VAR) \multimap (\downarrow_\sigma RESTR)$

(47)
$$\left[\begin{array}{l} \text{PRED} \quad \text{‘PAINT < (SUBJ) (OBJ)>’} \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{‘SKIN’} \\ \text{INDEX} \quad \left[\text{PERS} \quad 3 \right] \end{array} \right] \end{array} \right]$$

As it stands the verbal meaning won’t be able to consume the meaning of the nominal because it is of type <e,t>, that is, the type appropriate to a common noun. We assume some general type shifting (or equivalent) process applies quite generally (and independently of incorporation) in these languages to convert N to NP meanings.¹³

The(incorporating) generic specific construction is repeated as (48) and (49):

¹²Bininj Gun-wok also allows incorporation of an intransitive subject, but we leave that aside for now.

¹³An alternative is to lexicalize this by taking the verbal semantics to consume a nominal property (or collection of nominal properties) directly as sketched in (i).

- (48) **An-barnadja** *ngarri-mim-bowo-ni*
 VEG-owenia:verniosa 1a-fruit-put.in.water-PI

‘We used to put the owenia verniosa fruit in the water (to poison the fish).’

- (49) *-mim-bowo-* (\uparrow PRED) = ‘put.in.water < (SUBJ)(OBJ)>’
 $\lambda x \lambda y. put.in.water(x, y): (\uparrow SUBJ)_\sigma \multimap (\uparrow OBJ)_\sigma \multimap \uparrow_\sigma$
 (\uparrow OBJ (\in)) = \downarrow
 (\downarrow PRED) = ‘fruit (generic)’
 (\downarrow INDEX PERS) = 3
 (\downarrow INDEX NUM) = SG
 (\downarrow INDEX GEND) = VEG
 $\lambda x. fruit(x): (\downarrow_\sigma VAR) \multimap (\downarrow_\sigma RESTR)$

The equation (\uparrow OBJ (\in)) = \downarrow permits the f-structure of the incorporated nominal (\downarrow) to be either the OBJ as in (50) or a member of the set of f-structures which is the OBJ as in (51). If the syntax contributes a nominal for the OBJ, then given PRED uniqueness, the incorporate must be a member of a set (\uparrow OBJ \in). The phrase structure rules will provide the NP-APPOS template, as in (5) above, which associates the INDEX of the external nominal with the INDEX of the set.¹⁴

$$(50) \left[\begin{array}{l} \text{PRED} \quad \text{'PUT.IN.WATER < (SUBJ) (OBJ) >'} \\ \text{OBJ} \left[\begin{array}{l} \text{PRED} \quad \text{'FRUIT (GENERIC)'} \\ \text{INDEX} \left[\begin{array}{ll} \text{PERS} & 3 \\ \text{NUM} & \text{SG} \\ \text{GEND} & \text{VEG} \end{array} \right] \end{array} \right] \end{array} \right]$$

-
- (i) *-gurlah-bimbu-* (\uparrow PRED) = ‘paint < (SUBJ)(OBJ)>’
 $\lambda P \lambda x \exists y. paint(x, y) \wedge P(y): [((\uparrow OBJ)_\sigma VAR) \multimap ((\uparrow OBJ)_\sigma RESTR)] \multimap [(\uparrow SUBJ)_\sigma \multimap \uparrow_\sigma]$
 (\uparrow OBJ) = \downarrow
 (\downarrow PRED) = ‘skin’
 (\downarrow PERS) = 3
 $\lambda x. skin(x): (\downarrow_\sigma VAR) \multimap (\downarrow_\sigma RESTR)$

The use of existential closure raises a number of issues, and in particular interprets the incorporated argument as a narrowest scope indefinite. Further research would be required to determine whether this is justifiable, and so we leave this question open.

¹⁴In the case where the phrasal syntax contributes no additional member(s) to the set, it may be that nothing so far excludes the single incorporate being analyzed as a singleton set. Given that the correct semantics will be constructed, it is unclear to us whether this is a problem which should be addressed by additional constraints.

$$(51) \left[\begin{array}{l} \text{PRED} \quad \text{'PUT.IN.WATER < (SUBJ) (OBJ) >'} \\ \\ \text{OBJ} \left\{ \begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \\ \\ \left(\begin{array}{l} \text{PRED} \quad \text{'OWENIA.VERNICOSA'} \\ \\ \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \end{array} \right) \\ \\ \left(\begin{array}{l} \text{PRED} \quad \text{'FRUIT (GENERIC)'} \\ \\ \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \end{array} \right) \end{array} \right\} \end{array} \right]$$

This is the same f-structure as SN06 provide for the juxtaposed construction in (28a), thus capturing the functional similarity between the incorporated and non-incorporated versions.

However, there is a third logically possible option, which is that an external nominal induces a set, but the ↓ in the above lexical entry is equated with the set itself, rather than with a member of the set. If PRED were non-distributive, this would provide a PRED feature for the set itself, as in (52):

$$(52) \left[\begin{array}{l} \text{PRED} \quad \text{'PUT.IN.WATER < (SUBJ) (OBJ) >'} \\ \\ \text{OBJ} \left\{ \begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \\ \\ \text{PRED} \quad \text{'FRUIT (GENERIC)'} \\ \\ \left(\begin{array}{l} \text{PRED} \quad \text{'OWENIA.VERNICOSA'} \\ \\ \text{INDEX} \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \\ \text{GEND} \quad \text{VEG} \end{array} \right] \end{array} \right) \end{array} \right\} \end{array} \right]$$

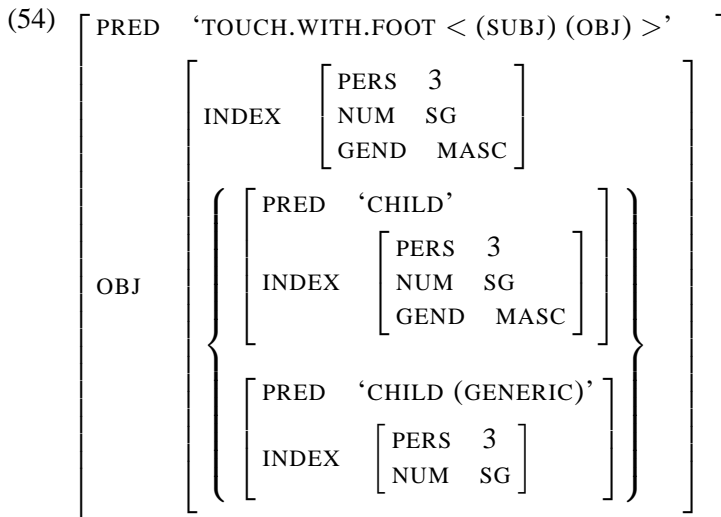
Clearly this is not a sensible-looking f-structure and so we want to be able to rule it out. We therefore assume that PRED is distributive, so that PRED uniqueness will rule out this possibility due to the PRED feature clash with the external nominal ('owenia.vernicosa' in the above). This ensures that ↓ will always be equated with a member of the set, not the set itself, in the event that there is an external nominal.

Thus, by simply allowing the incorporated nominal to optionally construct a set for the OBJ we can extend the SN06 analysis to account for these incorporated constructions, thereby capturing the functional equivalence between these constructions and the juxtaposed equivalents.

In Gunwinyguan languages the incorporated nominal in instances of 'general' NI (that is, beyond the cases of generic-specific and part-whole constructions which we focus on here) can be doubled with an external nominal expressing essentially equivalent information, an option which is found crosslinguistically but less frequently than doubling with more specific content. On our approach, this

possibility is accounted for, since the external nominal and the incorporated nominal jointly construct a set for the OBJ, as follows:

- (53) *Bi-yaw-melme-ng na-beywurd*
 3/3an-child-touch.with.foot-PP MASC-child
 ‘He kicked the child’ (Evans (1996, 88))



6 Further Research: Coordination and Incorporation?

Note that it was the shared external syntax of juxtaposed coordinations and generic-specifics, part-whole constructions and other appositions which provided a substantial part of the original motivation for the SN06 analysis, which in turn underlies the current approach to incorporation. So far, our approach to NI assumes that incorporation is limited **semantically** to the sorts of appositional construction types we discuss here, excluding coordinate constructions, but the question remains: Do conjuncts incorporate?

There are a couple of highly suggestive examples that may indicate that it is in fact possible to incorporate one nominal in a coordinated structure, thereby making the parallel with juxtaposed nominal constructions virtually complete. These examples are provided below:

- (55) *Oo gunak gare yi-yerrng-ma-ng, gun-boi.*
 oh fire perhaps 2-wood-get-NP IV-cooking.stone
 ‘Well maybe you should get some firewood and cooking stones’. (Evans (2003, 453))

- (56) *Bene-dalk-mey man-dalk-buk dja kun-dulk, bene-worrhme-ng bene-kinje-ng na-wu*
 3uaP-grass-getPP VE-grass-dry and IV-stick 3uaP-make.fire-PP 3uaP-cook-PP MA-DEM
wirlarrk.
 goose.egg
 ‘Gathering dry grasses and sticks, they made a fire to roast the eggs’ (Evans (2003, 453))

However, neither of these is a clear cut example of incorporated coordination since the comma suggests that ‘cooking stone’ may be an afterthought in (55), and the incorporated nominal in (56) is

actually in a generic-specific construction within one of the conjuncts, rather than being the conjunct itself. However, note that the nominal that is incorporated into the **adjective** *duk* ‘dry’ is clearly conjoined with the external nominal, suggesting that incorporated coordinations are indeed possible here (see Baker and Nordlinger (this volume) for detailed discussion of nominals incorporated into adjectives in these languages).

7 Conclusion

In this paper we have shown how the SN06 analysis can be extended to provide a single unified account of generic specific constructions which captures the functional and structural similarities between both juxtaposed and incorporated construction types. In doing so we also provide the first LFG account of classifier incorporation with doubling. There are a number of advantages to this analysis of noun incorporation. Firstly, it doesn’t require the postulation of new grammatical functions to deal with the doubled NP. Secondly, we don’t need to postulate null pronominals for the object in the event that there is no external nominal (cf. Rosen 1989). More importantly, we don’t force asymmetrical structure on the data (i.e. by calling either the incorporated nominal or the external nominal a modifier) when there is no empirical reason for doing so. Finally, this analysis allows for a seamless and integrated account of the interaction of verbal incorporations and adjectival incorporations in these languages, as discussed in Baker and Nordlinger (this volume).

Nonetheless, this paper represents no more than a toe in the water in terms of developing a treatment of incorporation in these languages. Many areas, especially those concerning the semantics of these constructions, still need much more investigation and our proposals are very preliminary. For example, it appears to be a cross-linguistically stable fact about incorporation that incorporated nominals can never take wide scope over other elements, such as negation and universal quantifiers elsewhere in the sentence, but matters of this sort are yet to be investigated for these languages. In addition, a much clearer understanding is needed of the discourse transparency of incorporated elements, so that firmer proposals can be made concerning the semantic treatment of the incorporate itself, and the same is true of nominals in juxtaposed constructions in general in these languages.

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