WALMAN *AND*-VERBS AND THE NATURE
OF WALMAN SERIALIZATION

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Abstract

The so-called *and*-verbs of Walman, described recently in Brown and Dryer (2008), are of a crosslinguistically unusual mixed category. They are morphologically verbs, but they serve to coordinate noun phrases and their maximal projections are noun phrases. This paper uses a Lexical-Functional Grammar (LFG) framework to compare Walman *and*-verbs to Walman transitive verbs, demonstrating the similarity between these two categories. Evidence for this similarity comes from the fact that Walman transitive verbs participate in inclusory serial constructions, in which the subject of one verb is the combined subject and object of the previous verb. It is argued therefore that all Walman transitive verbs must be able to coordinate their arguments in f-structure just as Walman *and*-verbs do. Thus *and*-verbs, while unexpected crosslinguistically, fit into the grammar of Walman relatively comfortably. The paper concludes with a brief commentary on the utility of an LFG-like framework as a tool for descriptive linguistics.

Introduction

In a recent article Brown and Dryer (2008) discuss the phenomenon of Walman *and*-verbs, words which are morphologically transitive verbs but syntactically serve as coordinators coordinating noun phrases. In the present paper I take the phenomenon described by Brown and Dryer and examine it more formally, focusing on Walman *and*-verbs and Walman transitive verbs. I wish to demonstrate that the functional[1] nature of Walman *and*-verbs is parasitic on the functional nature of Walman transitive verbs in general. The evidence for this similarity can be found in a particular type of serial verb construction (SVC) found in Walman. This type of SVC is called inclusory serialization (following Crowley 2002, 41), and is characterized by the subject of one verb being the aggregate of the subject and object of the previous verb. (See 9 below.) I will show that the functional structure present in the maximal projections of transitive verbs in this kind of serialization is the same type of structure found in noun phrases coordinated by *and*-verbs.

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1   By "functional" I mean relating to functional structure (f-structure) in the LFG sense. See Dalrymple (2006) for a brief introduction. This paper is not concerned with syntactic functionalism in the tradition of André Martinet, John Hawkins, etc.

The grammatical framework used in this paper is classical Lexical-Functional Grammar (LFG).[2] I hope this paper will serve to demonstrate the utility of an LFG-like model to descriptive linguistics. The relationship between inclusory serialization and *and*-verbs may be difficult to discern in a tree-theoretic framework in which constituent structure is the sole determinant of functional roles and functional structure. In an LFG-like framework, where constituency and functional structure are modeled separately, the functional similarity between *and*-verbs and inclusory serial constructions is readily apparent.

This paper is organized as follows: Section 1 gives a brief introduction to aspects of Walman grammar. Section 2 describes Walman *and*-verbs briefly and then shows how they appear in f-structure. The f-structure projections of *and*-verbs are also compared to the f-structure projections of ordinary coordinators. Section 3 shows how Walman SVCs appear in f-structure, arguing that Walman SVCs require a different f-structure analysis than the kind that has been given for SVCs in other languages. Drawing from sections 2 and 3, section 4 notes the unexpected f-structural similarity between Walman *and*-verbs and Walman transitive verbs. Section 5 describes the c-structural complexity of Walman *and*-verbs. Section 6 concludes the paper by noting that an LFG-like framework allows the descriptive linguist to make observations about functional structure directly, without the analysis being complicated by issues of constituency and category affiliation.

1   Background information about Walman grammar

Walman is a language in the Torricelli family spoken on the northern coast of Papua New Guinea. Verbs in Walman obligatorily carry pronominal affixes for core arguments subject (SUBJ) and object (OBJ). These affixes indicate person, number and gender of their respective arguments. Free noun phrases (NPs) representing the arguments are optional. The subject pronominal is always a prefix and the object pronominal is usually a suffix, unless the object is 1st or 2nd person (Brown and Dryer 2008, 531–2).

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2   Thanks to Dr. Raúl Aranovich for illuminating commentary on LFG leading up to this paper.

Like in many other Papuan languages, SVCs are common in Walman, as in (1).[3]

(1) Ako   runon   n-orou   n-arau
    then   3sg.m   3sg.m-go   3sg.m-go.up

     n-an   nakol   nngkal   mnon.
     3sg.m-be.at   house   small   GEN.3sg.m

'Then he went up to his own little house.'

(Brown and Dryer 2008, 531)

(1) is a single sentence with multiple verbs -*orou* 'go', -*arau* 'go up', and -*an* 'be at'. Interpreted collectively in the SVC, these verbs mean approximately the same thing as the English predicate *go up to*. There are sentence-level particles in Walman which can modify the entire SVC, typically occurring between the first verb and that verb's subject. These include the negative particle *mon*, the perfective particle *tu*, and the future particle *ampa* (Brown and Dryer 2008, 546). When these particles modify an entire SVC, the feature values associated with their lexical entries are interpreted as feature values for the entire sentence. I will return below to the theoretical treatment of SVCs in LFG. I will call properties of the entire SVC "sentence-level" properties.

2 *And*-verbs

2.1 *And*-verbs descriptively

The main topic of Brown and Dryer (2008) is Walman's unusual *and*-verbs. These words are morphologically transitive verbs, bearing obligatory subject and object pronominal affixes, and optionally taking overt NPs as arguments. However their meaning is the basic meaning of the English word *and*, the meaning of the logical operator &. *And*-verbs do the work of NP coordinators in Walman.

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3 Walman examples are written in the practical orthography used by Brown and Dryer (2008). See their footnote 2 for details. Following their convention, the first word in every complete sentence is capitalized, as are proper names.

(2) To   [[ru]   **w-aro-n**   [na]]   y-anan.
    then   3sg.f   **3sg.f-and-3sg.m**   son   3pl-go.down
    'Then she and the son went down.'
    (Brown and Dryer 2008, 551)

In (2), the *and*-verb *-aro-* is coordinating the free pronoun *ru* (3rd-person singular feminine) and the noun *na* 'son'. Pronominal morphology on *-aro-* agrees with the coordinands as if they were its subject and object. Hereafter I will refer to the first and second coordinands of an *and*-verb as its subject and object, respectively, since they behave in every way as if they were its subject and object. In (2), the pronominal prefix *y-* on the sentence-level predicate *-anan* 'go down' agrees with the entire coordinated structure *ru waron na* 'she and the son'.

Walman *and*-verbs can only coordinate NPs, not clauses or adjectives.[4] Non-NP constituents are coordinated with the particle *o*, which can also coordinate NPs. There are two *and*-verbs in Walman, *-aro-* and *-a-*. *-Aro-* can only take 3rd-person objects, but *-a-* can take any NP object, and both *and*-verbs can take any NP subject. Brown and Dryer find no meaning distinction between the two *and*-verbs, or between the *and*-verbs and the coordinating particle *o*. They report that these are intersubstitutable without change of meaning in every instance where selectional restrictions are not violated (Brown and Dryer 2008, 537–8).

2.2 *And*-verbs in LFG

It is felicitous to assume that *and*-verb stems are of the same category as transitive verb stems in Walman, and that they take a subject and an object argument. Under this assumption they will naturally participate in the general lexical rules which assign pronominal affixes to verb stems. For instance, rules (3) and (4) assign the 3rd-person plural object pronominal and the 1st-person singular subject pronominal respectively.

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4 Category-specificity is not uncommon for coordinators crosslinguistically. Languages with category-specific coordinators include Chechen, Chinese, Hausa, Japanese, Somali, Upper Kuskokwim Athabaskan, and Xârâcùù (Haspelmath 2004, 11–12).

(3) -y : [$V_{\text{trans stem}}$ __]$_{\text{V(trans stem)}}$, (↑OBJ PRED) = 'PRO'
                                (↑OBJ INDEX PERS) = { }
                                (↑OBJ INDEX NUM) = pl

(4) m- : [__ V_{stem}]$_{\text{V(fin)}}$, (↑SUBJ PRED) = 'PRO'
                                (↑SUBJ INDEX PERS) = {S}
                                (↑SUBJ INDEX NUM) = sg

These rules apply to all transitive verb stems, including *and*-verb stems. They do not apply to the coordinating particle *o*, which is of a distinct lexical category. Note that the value of the person feature (PERS) is a set. This set may contain S ("speaker") or H ("hearer"), or any combination thereof (including nothing, as in 3). If a PERS value includes S, it is 1st person. If it includes H and not S, it is 2nd person. Otherwise, it is 3rd person. This system for person values I adopt from Dalrymple and Kaplan (2000, §6). It is a good reflection of the semantic property that the feature PERS encodes, and proves to be a useful system for deriving PERS values in NP coordination.

An *and*-verb also must have the function of a coordinator for its arguments. Coordinators have two major functional roles crosslinguistically. First, they must distribute across-the-board properties to their arguments. Since there is no case marking in Walman, there are for NP coordinations no visible across-the-board properties — that is, properties which like case must be distributed to each member of a set of coordinands. Second, and importantly for this paper, coordinators must index properties of the coordinated structure that are non-distributive — that is, not across-the-board. For instance, consider *maro*, a fully inflected *and*-verb coordinating a 1st-person singular subject and a 3rd-person singular feminine object:

(5) m-aro-Ø
      1sg-and-3sg.f

The PERS and NUM features of the coordinated structure are called non-distributive because their values are not necessarily shared with the PERS and NUM values of the individual coordinands. For instance, neither coordinand in (5) is 1st-person plural, although the entire coordinated structure is. Following King and Dalrymple (2004; via Kuhn and Sadler 2007, 6–7), I will refer to the non-distributive features of coordinations as

INDEX features. In f-structure, INDEX features occur in a feature labeled INDEX. The value of INDEX for a coordinated NP will always have the NUM value plural, and its PERS value will be the combined set of values from the individual coordinands' PERS features. The appropriate INDEX feature could be accounted for with the annotations in (6).[5]

(6)　　(↑GF INDEX PERS) ⊆ (↑INDEX PERS)
　　　　(↑INDEX NUM) = pl

Note that since the coordinands of the *and*-verb are its subject and object, they can be collectively referred to as its GFs. The f-structure for (5) can be represented as in (7), this structure being derived using the lexical rules in (3) and (4), the annotations in (6), and a lexical entry for *-aro-* specifying that its PRED value is 'and ⟨(SUBJ)(OBJ)⟩'.
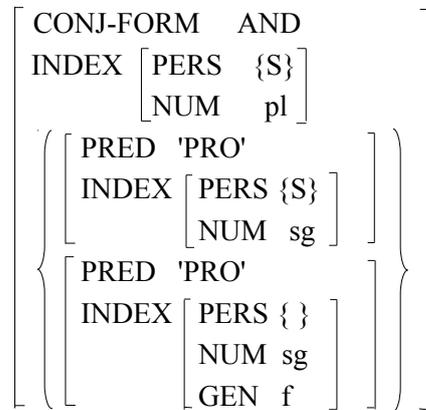
$$(7)\quad \begin{bmatrix} \text{PRED} & \text{'and } \langle(\text{SUBJ})(\text{OBJ})\rangle\text{'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{S\} \\ \text{NUM} & \text{pl} \end{bmatrix} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{S\} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{\,\} \\ \text{NUM} & \text{sg} \\ \text{GEN} & \text{f} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

It will be instructive to compare the structure in (7) to the structure of an ordinary coordinated NP structure. (8) represents the English coordinated NP *me and her*, given the kind of analysis used in Kuhn and Sadler (2007).

5　Writing a formal LFG grammar of Walman, the linguist would have to decide whether these annotations appear in the lexical entries for the *and*-verbs or whether they are instead annotations on the c-structure nodes containing the *and*-verbs. For the descriptive purposes of this paper, this distinction is immaterial. Importantly, *and*-verbs are associated with these annotations such that their f-structure projections look like the structure in (7).

(8) English coordinated NP: *me and her*

$$
\begin{bmatrix}
\text{CONJ-FORM} & \text{AND} \\
\text{INDEX} & \begin{bmatrix} \text{PERS} & \{S\} \\ \text{NUM} & \text{pl} \end{bmatrix} \\
\left\{
\begin{array}{l}
\begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{S\} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix} \\
\begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{\,\} \\ \text{NUM} & \text{sg} \\ \text{GEN} & \text{f} \end{bmatrix} \end{bmatrix}
\end{array}
\right\}
\end{bmatrix}
$$

The major difference between the *and*-verb structure in (7) and the ordinary coordinated structure in (8) is that the latter has no GFs. There is no reason to suppose that coordinators have GFs in languages without *and*-verbs. Instead of appearing as grammatical functions, coordinands of ordinary coordinators appear in f-structure as a set, like that indicated in (8) by curly brackets. It is possible that Walman *and*-verb f-structures have such a set also, in addition to having their coordinands represented as GFs. The existence of such a set is not material to the observations I wish to make about the *and*-verb, so I will ignore the issue hereafter. I will represent the f-structures of *and*-verbs without the set, simply to save space. Importantly, Walman *and*-verbs *do* have GFs, as evidenced by their taking regular pronominal morphology like transitive verbs.

Another difference between (7) and (8) is that the former has a PRED feature where the latter has a CONJ-FORM feature. I do not know a particular reason to posit a form feature CONJ-FORM for Walman *and*-verbs, as Kuhn and Sadler (2007) do for ordinary coordinators. The PRED feature seems a more natural choice for Walman *and*-verbs, since they subcategorize for grammatical functions, a common property of verbal PRED values. On the other hand, a logical operator is a strange meaning for a predicate. Again this is orthogonal to the purpose of this paper, so I will assume without further argument that PRED is the correct feature type.

Both (7) and (8) have an INDEX feature representing the non-distributive features of the entire coordinate structure. In both structures, this INDEX feature is derived from the INDEX features of the individual coordinands.

3 Walman verb serialization

Walman SVCs are of at least two types in Crowley's (2002) and Aikhenvald and Dixon's (2006) SVC typologies, specifically with regard to argument sharing. There are some constructions in which the SUBJ function of each individual verb picks out the same referent — these are subject-sharing serial constructions, such as in (1) above. In (1), all three verbs share the same subject. Walman also has what Crowley (2002) calls inclusory serialization constructions. In this type, the subject of one verb is the subject and object of the preceding verb taken together. An example is in (9), where the referent of the subject of *kesi* 'we go out' is the referent of *kum* 'me' and *pelen* 'dog' together (1sg + 3sg = 1pl).

(9) Kum   m-rachere-Ø   pelen   **k**-esi   nakol.

1sg   1sg-chase-3sg.f   dog   **1pl**-go.out   house

'I chased the dog out of the house.'

(Brown and Dryer 2008, 551)

3.1 Previous LFG treatments of verb serialization

Modeling verb serialization in LFG, Bodomo (1996) (following Alsina 1994) makes a strong assumption of feature-sharing between verbs in an SVC. Their PRED features "compose" into a single predicate-chain feature labeled PREDCHAIN, which is the predicate of the entire SVC. Their other features, such as tense, aspect, and GFs, simply unify at the sentence level.[6]

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6 Bodomo (1996) uses the c-structure annotation ↑ = H↓ to indicate the special type of co-heads whose PRED values compose while their other features unify. The details of Bodomo's PRED-composing process are unclear, though it is clear that the outcome is different from that of the predicate composition process in Arka et al. (2009) or Butt et al. (2003). These studies are concerned with the composition of predicates with unequal syntactic status, such that one predicate is comfortably analyzed as being contained within the other's set of arguments in f-structure:

PRED1 ⟨ (ARG1), … , PRED2 ⟨ … ⟩ ⟩

Since GFs unify in Bodomo (1996), the PREDCHAIN subcategorizes for a single subject argument SUBJ, and likewise for any other arguments present in a sentence. Following is the example Bodomo uses from Dagaare to illustrate predicate composition and sentence-level feature unification.

(10) Dagaare

Bayuo   da   ngmE-Ø   la   a   gan   lOO-Ø.

Bayuo   PAST   knock-PERF   FACT   DEF   book   cause.fall-PERF

'Bayuo knocked the book down.'

(Bodomo 1996, 11)

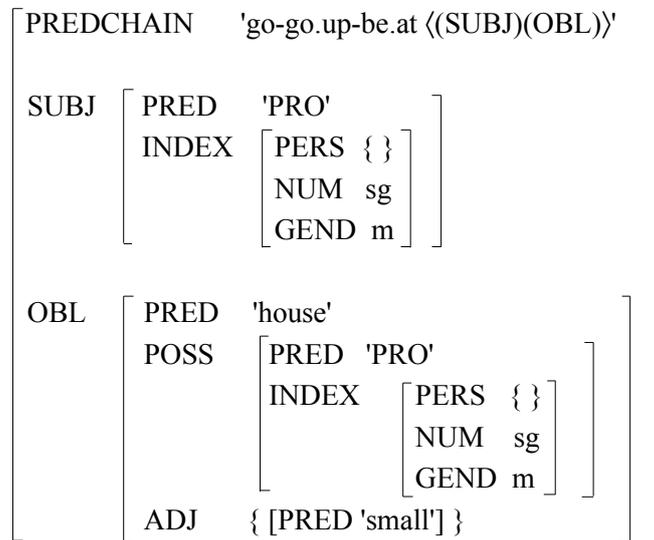(11) Dagaare: f-structure for (10) (adapted from Bodomo 1996, 13)

$$
\begin{bmatrix}
\text{PREDCHAIN} & \text{'knock-cause.fall } \langle(\text{SUBJ})(\text{OBJ})\rangle\text{'} \\
\text{TENSE} & \text{PAST} \\
\text{ASPECT} & \text{PERF} \\
\\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'Bayuo'} \\ \text{INDEX} & \begin{bmatrix} \text{NUM} & \text{sg} \\ \text{GEND} & \text{m} \end{bmatrix} \end{bmatrix} \\
\\
\text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'book'} \\ \text{INDEX} & \begin{bmatrix} \text{NUM} & \text{sg} \\ \text{GEND} & \text{n} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

A similar f-structure (12) could be posited for the Walman shared-subject serial construction in (1), ignoring the connective *ako* 'then'.

In Bodomo's analysis the serialized PREDs fuse together to form a single predicate feature labeled PREDCHAIN. This seems a more comfortable analysis for Dagaare, since the verbs in Dagaare SVCs do not seem to be of unequal syntactic status such that one would be contained within the other in f-structure.

(12) F-structure for (1): preliminary

$$
\left[
\begin{array}{ll}
\text{PREDCHAIN} & \text{'go-go.up-be.at } \langle(\text{SUBJ})(\text{OBL})\rangle\text{'} \\[2ex]
\text{SUBJ} & \left[\begin{array}{ll} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{PERS} & \{\,\} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{m} \end{array}\right] \end{array}\right] \\[6ex]
\text{OBL} & \left[\begin{array}{ll} \text{PRED} & \text{'house'} \\ \text{POSS} & \left[\begin{array}{ll} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{PERS} & \{\,\} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{m} \end{array}\right] \end{array}\right] \\ \text{ADJ} & \{\,[\text{PRED 'small'}]\,\} \end{array}\right]
\end{array}
\right]
$$

Bodomo (1996) is not the only LFG study to assume shared arguments in SVCs. Bodomo et al. (2003) and Beermann and Hellan (2002) both assume that every verb in an SVC shares a subject, and Seiss (2009) assumes that at least one argument is shared between verbs in an SVC.

3.2 Walman verb serialization in LFG

The studies listed above all capture the data in their target languages well. However, their assumptions of shared arguments do not hold for all Walman SVCs — for instance, those of the inclusory type. In this type, there is not a single SUBJ or OBJ for the entire sentence that is shared by all of the verbs in the SVC. Thus it cannot be said that GFs always unify in a straightforward way in Walman SVCs. In fact, since tense and aspect are often unmarked in Walman, there is often nothing that unifies across verbs in an SVC at all. Instead, the SVC appears as simply a series of verbs, each with its own set of GFs which is not necessarily identical to the GF sets of its sisters.[7]

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7   Since each verb in the SVC is relatively autonomous, at least insofar as its set of GFs is concerned, it might be appropriate to think of the Walman SVC as a "clause chain" rather than a typical serial verb construction. Clause chaining is common in the Papuan languages. It usually consists of a series of simple clauses with non-finite verbs ("medial verbs") all partially subordinated ("cosubordinated" per Foley and Van

Therefore I propose the following f-structure-theoretic treatment of SVCs in Walman: Each SVC is a set of independent clausal f-structures, each with its own PRED and its own set of GFs, these GFs having a scheme of inter-clausal coindexation.[8] Arguments of separate verbs in an SVC thus may be linked or remain independent. This is a certainly simplistic and probably overly permissive treatment of Walman SVCs; however, the paucity of data currently available about Walman grammar[9] does not permit a more subtle analysis. It is therefore appropriate here to work under a simplistic assumption about the f-structure of Walman SVCs that is in keeping with their general nature, rather than attempting a more complicated analysis based on too little data. The treatment I propose here reflects the relative functional autonomy of each verb in a Walman SVC, while also allowing the possibility of argument sharing.[10]
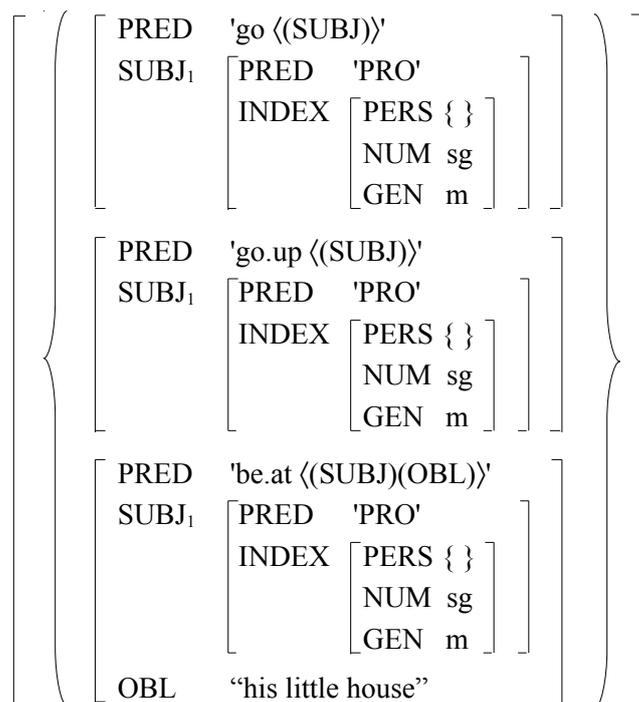

Valin 1984) under one finite verb (called a "final verb", since these generally come at the end of the chain). Like SVCs, clause chains are single sentences. There is an indeterminate boundary between SVCs and clause chains, and I believe Lehmann (1988) is correct in identifying the difference as one of degree of grammaticalization, the SVC being a more highly grammaticalized clause chain. Thus I think it is not necessary to posit inherently different syntactic mechanisms for SVCs and clause chains. It is also worth noting that Walman SVCs are not canonical clause chains, since no verb in the SVC is (overtly) more finite than the rest.

8   I assume here a mechanism of coindexation rather than structure-sharing, though I see no immediate argument for choosing one over the other in this case.

9   Dryer's website indicates that a descriptive grammar is forthcoming.

10 A complete analysis of Walman SVCs would require an explicit account of how the system of inter-clausal coindexation is generated by the grammar. Such an account is not possible however without more information about Walman grammar. Only some very general comments are possible: (i) Presumably only features whose INDEX values are non-contradictory may be coindexed with one another. (ii) The relative order of the clauses is presumably important for determining what is coindexed with what. This information need not be represented in f-structure however, since it is available from c-structure information. In formal LFG, information about c-structure order is available to f-structure via f-precedence relations and head-precedence relations (Crouch et al. 2005, ref.#N4.2.9; Zaenen and Kaplan 1995, 226). (iii) Some interplay with semantic or pragmatic structures may also need to play a role, if it is found that c-structure and f-structure cues are inadequate for completely determining the scheme of coindexation.

The revised f-structure for (1) will thus appear as in (13).[11] Note that separate reflexes of the shared subject *runon* (3sg.m) appear in the local f-structures of each verb, and these are coindexed with one another.
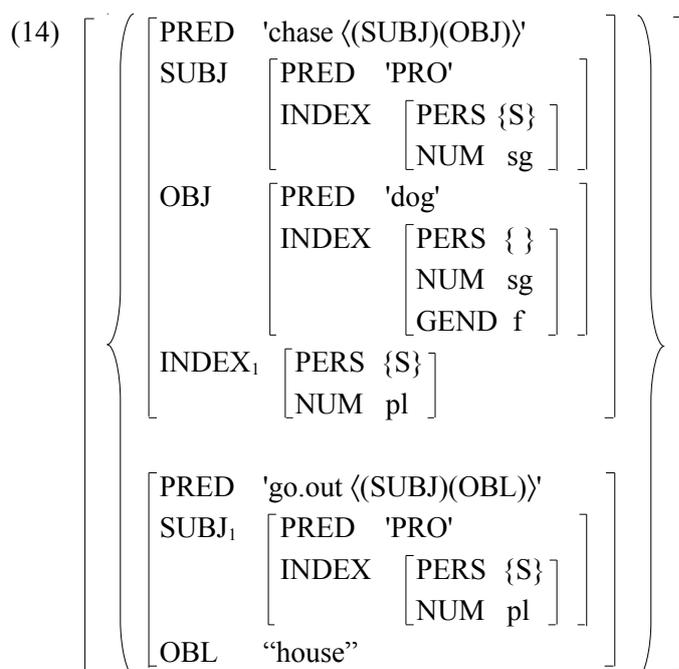
(13) F-structure for (1): revised

$$
\begin{bmatrix}
\left\{
\begin{array}{l}
\begin{bmatrix}
\text{PRED} & \text{'go} \langle(\text{SUBJ})\rangle\text{'} \\
\text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{\ \} \\ \text{NUM} & \text{sg} \\ \text{GEN} & \text{m} \end{bmatrix} \end{bmatrix}
\end{bmatrix} \\[2em]
\begin{bmatrix}
\text{PRED} & \text{'go.up} \langle(\text{SUBJ})\rangle\text{'} \\
\text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{\ \} \\ \text{NUM} & \text{sg} \\ \text{GEN} & \text{m} \end{bmatrix} \end{bmatrix}
\end{bmatrix} \\[2em]
\begin{bmatrix}
\text{PRED} & \text{'be.at} \langle(\text{SUBJ})(\text{OBL})\rangle\text{'} \\
\text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \begin{bmatrix} \text{PERS} & \{\ \} \\ \text{NUM} & \text{sg} \\ \text{GEN} & \text{m} \end{bmatrix} \end{bmatrix} \\
\text{OBL} & \text{``his little house''}
\end{bmatrix}
\end{array}
\right\}
\end{bmatrix}
$$

A further question arises with regard to the f-structure of inclusory SVCs. In an inclusory SVC, the SUBJ of one verb is the aggregate of the SUBJ and OBJ of the previous verb. Assuming that the relationship between the arguments of the two verbs in the SVC is to be represented in the syntax, how can this relationship be represented using the proposed scheme of inter-clausal coindexation? In other words, with what f-structure entity is the SUBJ of the second verb coindexed? It would appear that the first verb must construct a coindexable entity in f-structure for this purpose, whose INDEX features are the aggregate of the INDEX features of its arguments. The

11 As in (12), any f-structure reflex for *ako* 'then' is omitted in (13). The NP *nakol nngkal mnon* 'his little house' is represented as an argument only of the final verb, mostly in the interest of space, though in principle (and without having consulted with a Walman speaker or expert) it could be an oblique argument for more than one of the verbs.

f-structure of (9) can thus be represented as in (14), with the INDEX of *mrachere* 'chase' coindexed with the SUBJ of *kesi* 'go out'.[12,13]

$$
(14) \quad \left[\left\{ \begin{array}{l} \left[\begin{array}{ll} \text{PRED} & \text{'chase } \langle(\text{SUBJ})(\text{OBJ})\rangle\text{'} \\ \text{SUBJ} & \left[\begin{array}{ll} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{PERS} & \{S\} \\ \text{NUM} & \text{sg} \end{array} \right] \end{array} \right] \\ \text{OBJ} & \left[\begin{array}{ll} \text{PRED} & \text{'dog'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{PERS} & \{\,\} \\ \text{NUM} & \text{sg} \\ \text{GEND} & \text{f} \end{array} \right] \end{array} \right] \\ \text{INDEX}_1 & \left[\begin{array}{ll} \text{PERS} & \{S\} \\ \text{NUM} & \text{pl} \end{array} \right] \end{array} \right] \\[2em] \left[\begin{array}{ll} \text{PRED} & \text{'go.out } \langle(\text{SUBJ})(\text{OBL})\rangle\text{'} \\ \text{SUBJ}_1 & \left[\begin{array}{ll} \text{PRED} & \text{'PRO'} \\ \text{INDEX} & \left[\begin{array}{ll} \text{PERS} & \{S\} \\ \text{NUM} & \text{pl} \end{array} \right] \end{array} \right] \\ \text{OBL} & \text{``house''} \end{array} \right] \end{array} \right\} \right]
$$

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12 I assume that the INDEX node is directly attached at the local f-structure of the verb which constructs it.

13 Alert readers may notice an inconsistency in my treatment of pronominals in (14). There is a 3rd-person singular feminine object pronominal suffix on *-rachere-* 'chase', and this suffix generally supplies the value 'PRO' for the PRED feature of its GF. However, the value of PRED here is supplied by the free NP *pelen* 'dog' instead. A more consistent theoretical treatment here would be to consider the f-structure projection of the NP *pelen* to be an adjunct (ADJ) of *-rachere-*, coindexed with its OBJ. In this way the PRED values of the pronominal and the NP would not conflict, yet *pelen* could still be structurally identified with the OBJ of *-rachere-*. This would be an f-structural equivalent of Jelinek's (1984) tree-theoretic analysis of nonconfigurationality in Warlpiri.

It seems to me that representing this kind of scheme in (14) would distract the reader from the coindexation most relevant to the inclusory serialization, namely that between the SUBJ of *-esi* and the INDEX of *-rachere-*. I have therefore (inconsistently) treated the object-pronominal on *-rachere-* as if it were an agreement marker in this case, in an attempt to maintain focus on the central descriptive issues of this paper. This treatment is reminiscent of Hale's (1983) original analysis of Warlpiri, in which overt nominals are "linked" to verbal argument positions if and only if there are overt nominals. (See Hale's Linking Rule, p. 14.)

4 Inclusory serialization and Walman *and*-verbs

In a language like Walman that allows inclusory serialization, any transitive verb must have the capacity to construct an INDEX feature composed of the coordinated INDEX features of its GFs. This is because any transitive verb may in principle be the first verb in an inclusory SVC, and the second verb will need some entity in f-structure with which its SUBJ may be coindexed. This entity can be accounted for with the following argument-coordinating annotations:

$$(\uparrow\text{GF INDEX PERS}) \subseteq (\uparrow\text{INDEX PERS})$$
$$(\uparrow\text{INDEX NUM}) = \text{pl}$$

Note that these annotations are identical to the annotations for *and*-verbs proposed above in (6).[14]

It is therefore not a special property of *and*-verbs that they coordinate their arguments in f-structure. Since all Walman transitive verbs can coordinate their arguments in f-structure, Walman *and-* verbs coordinate their arguments simply by virtue of the fact that they are Walman transitive verbs. The functional nature of the crosslinguistically unusual Walman *and*-verb is thus parasitic on the functional nature of Walman transitive verbs in general.

5 *And*-verbs in c-structure

Given the claim that *and*-verbs have functional properties identical to ordinary transitive verbs in languages with inclusory serialization, it might be expected that *and*-verbs should be more common than they are. Inclusory serialization has been widely documented,[15] but *and*-verbs have only been documented in the small Torricelli family.[16] I propose that the crosslinguistic

14 Writing a formal grammar of Walman one would have to decide whether these annotations appear in the lexical entries of transitive verbs or as annotations on the c-structure nodes containing them. The latter may be preferable, so that the annotations could appear only in syntactic environments where they are necessary (i.e. inclusory SVCs). For the descriptive purposes of this paper, it suffices to say that the annotations are somehow associated with Walman transitive verbs such that they project a coordinator-like f-structure, like the projection of *mrachere* 'chase' in (14). Cf. footnote 5, above.

15 Crowley (2002, 41) notes its presence in Paamese; and chapters from Aikhenvald and Dixon (2006) demonstrate inclusory SVCs in Ewe (p.130), Dumo (214), Thai (167), and Mwotlap (231).

16 Similar categories have been observed in some Austronesian languages of Timor

rarity of *and*-verbs may be due to the complexity inherent in their categorial affiliation.

Walman *and*-verbs in themselves behave like ordinary Walman transitive verbs. They take two NP arguments, and pronominal morphology agrees with these as subject and object. They share the entire pronominal paradigm of ordinary transitive verbs. Thus morphologically, and with regard to the category of their arguments, *and*-verbs are typical of the category transitive verb. Also, sentence-level particles such as the negative, perfect, and future particles — which typically occur between the first verb in a sentence and its subject — may occur between the *and*-verb and its subject, if the *and*-verb is the first verb in the sentence (Brown and Dryer 2008, 546–7). See (15). In this way *and*-verbs are distributed in c-structure as if they are ordinary transitive verbs.

(15) Rita ampa w-aro-Ø   Millie y-orou Achapei.
          FUT   3sg.f-and-3sg.f   3pl-go Aitape
      'Rita and Millie will go to Aitape.'
      (Brown and Dryer 2008, 547)

Not all c-structure evidence indicates that the *and*-verb is an ordinary transitive verb, however. Strangely, the maximal projection of the *and*-verb in c-structure is a noun phrase. It can participate in possessive constructions (16), it can be a nominal predicate (17), the object of an adposition (18), it can be modified by the NP-modifying adjunct *alpa* 'only' which cannot modify verb phrases (19), it cannot stand on its own as a grammatical sentence (20), and it can even be coordinated by other *and*-verbs, which must have NP coordinands (21).

(16) Kompowaley w-kum [m-aro-y]   w-orou kelki pa.
      story   GEN-1sg 1sg-and-3pl 3sg.f-go end   DEM
      'Our ([my and their]) story has come to an end.'
      Brown and Dryer (2008, 541)

(17) ... chu-tey w-ri   lasi   [Kampail w-aro-Ø   Slim].
          wife-pl   GEN-3pl name   3sg.f-and-3sg.f
      '... their wives' names were [Kampail and Slim].'
       Brown and Dryer (2008, 541)

(18) Nyi   y-roul   [Rita   w-aro-Ø   Millie] wor.
      lamp   3pl-hang   3sg.f-and-3sg.f   above
      'The lamp is hanging above [Rita and Millie].'
      Brown and Dryer (2008, 543)

(19) [Rita   w-aro-Ø   Millie] alpa-y   y-orou Achapei.
               3sg.f-and-3sg.f   only-pl 3pl-go Aitape
      'Only [Rita and Millie] went to Aitape.'
      Brown and Dryer (2008, 543)

(20) *[Runon   n-aro-n   au].
      3sg.m   3sg.m-and-3sg.m   elder.brother
      'He is with elder brother.' / 'He and elder brother.'
      Brown and Dryer (2008, 550)

(21) [[Steve n-aro-Ø   Mary] y-p-a]   k-orou tesin.
               3sg.m-and-3sg.f   3pl-1.OBJ-and 1pl-go town
      '[[Steve and Mary] and I] went to town.'
      Brown and Dryer (2008, 544)

An interesting piece of evidence for the categorial complexity of the *and*-verb may be found in the details of the distribution of the negative particle *mon* (see Brown and Dryer 2008, 551–2). In its unmarked use, *mon* appears immediately before the first verb in a sentence, after its subject if the subject is overt. When an *and*-verb occurs with no NP arguments at the beginning of a sentence, *mon* may appear in one of two places. Sometimes

mon is positioned first, as if the *and*-verb is a verb (22); sometimes *mon* appears after the *and*-verb, as if the *and*-verb is the NP subject of the following verb (23).   Thus whatever c-structure rule determines the placement of *mon* is ambiguous in this type of sentence. The position of the negative particle in (22)   provides evidence that although the maximal projection of an *and*-verb is an NP, the *and*-verb itself is still interpretable in c-structure as a verb.

(22) Mon   n-aro-n   y-ara.

     NEG   3sg.m-and-3sg.m   3pl-come

    'They ([he and him]) didn't come.'

    Brown and Dryer (2008, 552)

(23) N-aro-n   mon   y-ara.

    3sg.m-and-3sg.m   NEG   3pl-come

    'They ([he and him]) didn't come.'

    Brown and Dryer (2008, 552)

The categorial complexity of the Walman *and*-verb is thus evident from its behavior in c-structure: It is a transitive verb whose maximal projection is an NP. This presents a difficult problem for a c-structure analysis of the *and*-verb. Apparently an unusual rewrite rule such as (24) is necessary.

(24)   NP $\rightarrow$ (NP) V (NP)

This rule would have to be restricted to instances where V is an *and*-verb, and in any case it violates the common assumption that a phrase must contain a head of its own category.[17,18] The reason for the crosslinguistic rarity of the *and*-verb may therefore be the complexity of its categorial affiliation.

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17 Though see Dryer (2004) for a discussion of NPs without nouns crosslinguistically.

18 Broadwell (p.c.) points out that (24) may be present in the grammar independently if Walman has head-internal relative clauses. From the brief description in Brown and Dryer (2008, 533), it appears that Walman relative clauses are not head-internal.

6 The utility of an LFG-like model to descriptive linguistics

In this section, the content of the preceding sections will be briefly discussed at a meta-analytical level to demonstrate the utility of an LFG-like model for descriptive linguistics. By "LFG-like" I mean a model in which different kinds of grammatical relationships are modeled separately — especially relevant here is that f-structure and c-structure are modeled separately. This kind of model will be contrasted with a "tree-theoretic" model[19] in which constituent structure is taken to be primary, and all other grammatical relationships are ultimately derived from constituency.

Sections 2.2 and 3.2 are analyses of Walman *and*-verbs and Walman serialization. Drawing from these analyses, section 4 presents the observation that a seemingly unusual property of *and*-verbs (that they coordinate their arguments) is in fact a property of all Walman transitive verbs. This observation is a simple one, and it sheds some light on the nature of Walman *and*-verbs and their position within Walman grammar. These analyses and the resulting observation are all conducted within a limited domain — that domain which LFG models as f-structure. The similarity between Walman *and*-verbs and Walman transitive verbs lies in the way that they coordinate their arguments (GFs) in f-structure such that the resulting coordination is available externally, for arguments of other verbs to be identified with. The resulting comparison of *and*-verbs and transitive verbs in Walman thus sidesteps the difficult issues of categorial affiliation discussed in section 5.

In contrast, a tree-theoretic model of grammar cannot sidestep the issues of category and constituency, since these are taken to be primary. A linguist using such a model would therefore be forced to confront the difficult issue of the *and*-verb's category and maximal projection before proceeding to make any observation about its functional similarity to transitive verbs. It remains for such an analysis to be attempted to discover the extent to which this issue would be problematic in practice. However it is clear that an LFG-like model provides a more direct avenue for describing phenomena in the realm of f-structure, in isolation from issues of category and constituency.

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19 This terminology is from Ackerman (2009).

Summary

Due to the presence of inclusory SVCs in Walman, all Walman transitive verbs must be able to construct an INDEX feature composed of the INDEX features of their arguments. In this respect Walman transitive verbs have a coordinative function, and Walman *and*-verbs are in fact typical Walman transitive verbs. *And*-verbs however do not behave like ordinary transitive verbs in c-structure. In a tree-theoretic approach, the functional relationship between Walman *and*-verbs and Walman transitive verbs may be difficult to discern, since the c-structural complexity of the *and*-verb would be a distraction. An LFG-like framework in which f-structure is modeled separately from c-structure thus allows for a more straightforward description of phenomena like the Walman *and*-verb.

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