Morphology and Argument Structure

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1 Introduction

One of the challenges in linguistics is how to account for expected patterns of argument realisation, possibly associated with certain classes of verbs and their morphology, within or across languages. Such patterns include passivisation, 'spray-load' alternations and transitive-intransitive alternations. Consider the following passivisation in English (1) and Indonesian (2).

(1). a. *The people elect the president.*

 b. *The president is elected (by the people).*

(2). a. *Anjing   itu   mengejar kucing   itu.*   *(Indonesian)*
 dog   that   AV.chase   cat   that
 'The dog chased the cat.'

 b. *Kucing   itu   dikejar   (oleh   anjing itu).*
 cat   that   DI-chase   by   dog   that
 'The cast was chased by the dog.'

One of the important characteristics of passivisation illustrated by (1) and (2) is that passivisation changes the syntactic status of the agent and patient arguments. The agent in the active voice in the (a) sentences is the syntactic subject, coming preverbally. It becomes an (optional) oblique in the passive (b) counterparts. Passivisation in these two languages is also marked morphologically on the verb, e.g. by –ed (past participle) in English and *di-* in Indonesian.

However, there are languages which exhibit a syntactic passive without passive morphology. Manggarai (an Austronesian language in Indonesia) is such a language. Like in English and Indonesian, the agent in Manggarai can alternatively be realised as the subject in an active voice sentence (3)a or an oblique in a passive voice sentence (3)b. The oblique is also expressed by a prepositional phrase (with clitic *l=*). The verb form is, however, morphologically the same in both active and passive sentences.

(3). a. *Aku   cero   latung=k.*   (Manggarai)
 1s   fry   corn=1s
 'I fry/am frying corn.'

 b. *Latung   hitu   cero   l=aku=i.*
 corn   that   fry   by=1s=3s
 'The corn is (being) fried by me.'   (Arka and Kosmas 2005)

Other types of argument alternations that have been of interest in the literature include the 'spray-load' alternations in English as exemplified in (4). This alternation in English involves no distinct verbal morphology. A similar alternation in other languages could be associated with different verbal morphology. In Balinese, for example, the structure

corresponding to English (4)b would require a locative applicative morpheme *-in* as seen in (5)b.

(4). a. *The peasants loaded hay onto the wagon.*

b. *The peasants loaded the wagon with hay.*

(5). a. *Nyoman mempen sumi ka cikar-e.* (Balinese)
Nyoman AV.load hay to wagon-DEF
'Nyoman loaded hay onto the wagon.'

b. *Nyoman mempen-in / * mempen cikar-e (aji) sumi.*
Nyoman AV.load-APPL AV.load wagon-DEF with hay
'Nyoman loaded the wagon with hay.'

Verbs which appear to have similar meaning may not behave in the same way even within the same language. For example, while *load* allows both (a) and (b) alternatives as seen in (4), similar three-place verbs involving a displaced theme in English such as *pour* and *fill* do not (Sadler and Spencer 1998): *pour* and *fill* only allow one of the alternatives as seen in (6)-(7).

(6). a. *The peasants poured water into the tank.*

b. * *The peasants poured the tank with water.*

(7). a. * *The peasants filled water into the tank.*

b. *The peasants filled the tank with water.*

Another type of argument alternation of interest is the transitive-intransitive alternation exemplified by the verb *break* in English:

(8). a. *Ira broke the vase.*

b. *The vase broke.*

Not all transitive verbs in English allow this type of alternation, e.g. the intransitive structure of *cut* as seen in (9)b below is unacceptable:

(9). a. *Ira cut the bread.*

b. * *The bread cut.*

As seen, the transitive-intransitive alternation in (8) is not marked morphologically. This raises the following related questions. How can the relation between the two be explained? Can one variant be considered more basic than the other? If yes, can the derivation be described in terms of a rule? If not, how can the relations between the two be explained?

In the absence of morphology marking the alternation, the question of the basic variant cannot be straightforwardly answered. There are competing analyses for the intransitive as being basic (Parsons 1990; Härtl 2003, among others), as well as the transitive (Levin and Hovav 1995:108; Reinhart 2002, among others). Cross-linguistic morphological

evidence shows that either variant can be morphologically more complex than (i.e. derived from) the other.

It appears these alternations are not totally lexically determined by the verb. They can also be partly dependent on the (theme) arguments; certain choices of theme arguments do not allow the alternation (Rappaport Hovav and Levin 2011):

(10). a. *He broke his promise/the contract/the world record.*

b. * *His promise/the contract/the world record broke.*

The same restriction of the choice of theme is observed in the Indonesian equivalent to the English *break*. The argument enters into a rather complex system of alternations, possibly with or without additional causative morphology.

For a theme whose referent is understood as inherently fragile and easily breakable (often into many uncountable pieces), the intransitive variant is basic, and the transitive variant must be formed with the causative suffix *–kan*:

(11). a. *Cangkir   itu   pecah.*
cup   that   broken
'the cup broke/ is broken.'

c. *Cangkir   itu   saya   pecah-kan.*
cup   that   1s   broken-CAUS
'I broke the cup.'

b. * *Cangkir itu saya pecah.*

For a theme that is not inherently fragile and the agent typically has some control over the 'breaking' process, e.g. the number of pieces as the outcomes, the intransitive variant is not available. Importantly, the transitive variant does not require a causative suffix:

(12). a. *Daging   itu   saya   pecah/*pecahkan   tiga*
meat   that   1s   break   break-CAUS   three
'I split the meat into three pieces.'

b. * *Daging itu pecah tiga.*
   'the meat broke into three pieces.'

c. *Cangkir itu/?kayu   itu   pecah   tiga*
cup that   wood   that   broken   three
'The cup/?wood broke into three pieces.'

Cross-linguistic patterns exemplified above raise questions on the role of morphology and constructions in the principles and mechanism regulating argument expressions. The issues include valency or subcategorisation (e.g. how many and what types of arguments a predicate can have), marking and surface patterning (e.g. whether the arguments can alternate, and if yes, how the alternations are encoded, morphologically or constructionally), generalisation and universality (e.g. to what extent the principles apply within and across languages; to what extent properties of arguments also constrain their possible realisations).

These issues have been the subject of intense research in contemporary linguistics. Predicting syntactic patterning from the meaning of the predicate, and the converse — predicting the meaning of the predicate from syntactic/constructional patterning — have both been controversial. The mainstream generative grammars — derivational as in Chomskyan Minimalist frameworks, or; non-derivational lexicalist as in Lexical-Functional Grammar (LFG) (Bresnan 2001; Dalrymple 2001; Falk 2001) and Head-driven Phrase Structure Grammar (HPSG) (Pollard and Sag 1994; Sag, Wasow, and Bender 2003) — typically adopt the view that lexical meaning determines (or 'is projected onto') the syntax. The enterprise is then to work out the model, representation, and principles regulating how syntactically relevant meaning can be projected onto the syntax. The notion of argument structure (a-str for short) is part of this enterprise. (While we have to keep in mind that properties of arguments may constrain argument realisation, in this chapter we mainly focus on a-str.)

However, there is no unified notion of a-str across theories. The conception of a-str and its representation is embedded as a part of a larger theoretical framework. The precise detail of a-str may vary even within the same theory depending on the author's choices within the theory.

We first discuss differing conceptions of a-str, showing the divergence and consensus (section 2). We then examine different operations involved (lexical, morphological and constructional) and their interactions (section 3). After reviewing linking across theories, we develop an a-str-based analysis to account for different kinds of processes that affect argument realisations. For reason of space, we only focus on operations on head predicates, ignoring other interesting cases, e.g. as encountered in nominalisation.

2   Conception and representation of argument structure

Argument structure is an abstract structure representing syntactically-relevant information pertaining to the number and type of arguments. Relative prominence of arguments is also registered in the a-str. In what follows, we briefly discuss common representations of a-strs, starting with the projectionist approach.

The projectionist approach adopts the view that syntactic patterning of a predicate is largely lexically driven. That is, syntax is projected from the predicate's a-str which is part of the information of the lexical entry. Let's call this a-str a 'lexical a-str'. Projectionist theories diverge in the specifications of lexical a-strs and, of course, their representation.

The simplest and most common way of representing lexical a-strs is by listing the arguments in angle brackets. There are different ways of encoding the arguments: as variables *x, y, z* etc., as in (13)a, or as slots as in (13)b:

(13).   a. 'pred <x, y>'
          b. 'pred< _ , _>'

This means that the predicates require two arguments. The syntactic properties of these arguments are not specified.

The argument in the a-str may come with syntactic information such as its 'external' or 'internal' status[1] and the categorical coding (Grimshaw 1990; Levin & Rappaport Hovav 1988; Zubizarreta 1987 among others):

(14). $x <y, P_{loc} z>$

The a-str in (14) says that it is a three-place predicate with x being an external argument (realised as subject) represented as outside the angle brackets, and y being a direct internal argument and z an argument governed by a locative preposition.

The syntactic information about (direct) coreness (i.e. whether an argument is oblique or not) may also be registered in the a-str (Manning 1996; Arka 2003; Arka and Manning 2008). The core and non-core distinction may be represented by a vertical bar as in (15)a or by nested angle brackets (15)b.

(15). a.   (Core) (Non-Core)   b.   (Core) (Non-Core)

    'put <—, — | —>'   'put << —, — >< — > >'

    (ag) (pt) (loc)   (ag) (pt) (loc)

The representation in (15) says that *put* is a three-place predicate, the first two arguments are core arguments and the last one is non-core. While arguments are syntactic in (15), they are ranked and the ranking within each group reflects thematic prominence, e.g. the left most is the agent, followed by patient/theme. Argument ranking is further discussed in section 4.1.

Semantic role information is explicitly registered in the a-str representation in (16). The arguments are labelled in terms of their specific thematic roles as (16)a, adopted in LMT; or as proto-roles adopted in Alsina (1996).

(16). a. 'hit< agent, patient>'   b. 'hit<[P-A], [P-P]>'

Jackendoff (Jackendoff 1990) adopts a purely semantic conception of a-str. In his model, an argument NP is associated with multiple thematic positions at the semantic or lexical conceptual structure (LCS). LCS is a rich structure consisting of separate tiers (action tiers, thematic tiers). Throughout this chapter, however, we consider the LCS as a layer representing semantic structure, distinct from (syntactic) a-str.

In a non-projectionist approach, e.g. in the construction grammar (Goldberg 1995), a constructional a-str is recognised in addition to the lexical a-str. (Not all versions of construction grammars recognise lexical a-strs, however). For example, the verb *sneeze* in English is lexically intransitive with an a-str shown in (17)a. The Cause-Motion Construction, however, carries a three-place constructional argument structure which augments the verb *sneeze* to become a three-place transitive verb when it appears in this construction, as exemplified in (17)b.

(17).   a. 'sneeze <sneezer>'

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[1] External and internal arguments are distinguished on the basis of different structural positions in relation to VP. The agent is an external argument as it always surfaces as the subject (i.e. outside VP) whereas o patient and other arguments are internal arguments (i.e. within VP). Note that this notion assumes a deep, universal VP across languages (i.e. all languages are configurational), something not shared by all theories; see the discussion of configurationality in (Austin and Bresnan 1996; Bresnan 2001).

b. *John*_{SUBJ} *sneezed the napkin*_{OBJ} *off the table*_{OBL}.

This is discussed further in relation to the significance of constructions in sections 3 and 4.3.

The representation of lexical and constructional a-str so far discussed assumes a conception of grammar where lexicon and syntax are separate, each consisting of different kinds of structures. A lexical a-str carries syntactic information in certain versions of it, e.g. as in (15), but it is itself not a syntactic structure. The interface between them is regulated by mapping principles, further discussed in section 4.

There has been recent development within the Chomskyan Minimalist Program (MP) to get rid of a strict distinction between lexicon and syntax, and therefore to get rid of mapping theory altogether (e.g. Pykkänen 2008). For this to work, the a-strs carried by head predicates must necessarily be syntactic structures. A-strs in this view are not simply lists of ordered arguments. Rather, they *are* syntactic phrase structures representing configurational argument positions. The precise detail of how this idea is implemented, however, varies between authors within the Chomskyan frameworks (Baker 1988; Hale and Keyser 1993; Kratzer 1996; Erteschick-Shir 2007; Pykkänen 2008; Ramchand 2008, among others).

To illustrate the point, for simplicity, let us consider one version proposed by Erteschick-Shir (2007). In her analysis, following the leading idea from (Hale and Keyser 1993), the entry for *break* looks like (18).

(18). a. BREAK: /break/_V   , M ('forceful means'), S ('broken')

The entry says that the morpho-phonological form of the predicate is /break/. It is categorially a verbal head (V). It comes with two meaning components, M 'forceful means' and S ('broken'). M stands for 'Manner (=means/manner/instrument)' whereas S stands for 'State'.

Note that the meaning components of M and S in (18) *are* (short-hand for) syntactic tree structures, shown in (19). S projects A, with the projected V-A predicate interpreted as a 'change' predicate, (19)a. The other meaning component of *break* M 'forceful means' can project an activity with the structure shown in (19)b. However, M can also modify the projected V-A predicate, giving rise to the structure shown in (19)c.

(19). a. b. c.
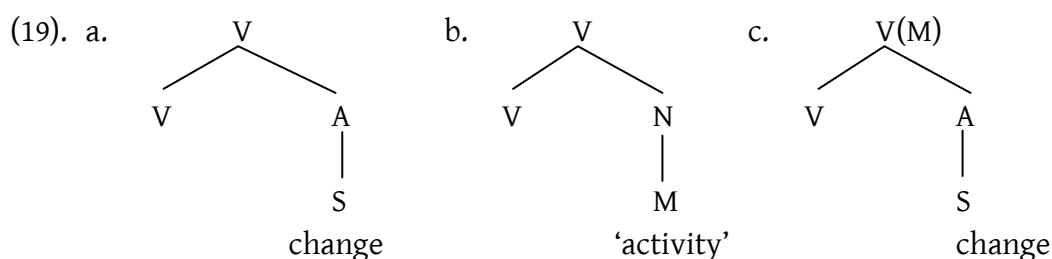
Further merging V with D, an argument position, the lexical information in (18) gives rise to intransitive and transitive argument structures of *break*, shown in (20)a and (20)b respectively. (It is assumed that the merge of M ('activity') with D gives rise to the interpretation of D as (proto-)agent and S ('change') gives rise to D as theme.) In (20)a, the state S of *break* (i.e. 'broken') merges with its head giving rise to the 'change' interpretation,

which is then modified by M 'forceful means', resulting in the complete interpretation of 'become broken with force'. In the transitive *break* (20)b, the same happens as in (20)a in terms of complement state S projection. However, two copies of the verb *break* are merged, forming a chain of which only the head is pronounced. The *break* 's M in (20)b modifies the upper cause predicate, however.

(20).

a.

'The vase went to a broken state
(with force) =The vase broke.'

b.

'Jane caused (with force) the vase to go to
a broken state = Jane broke the vase.'
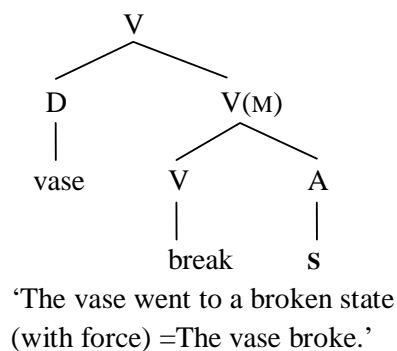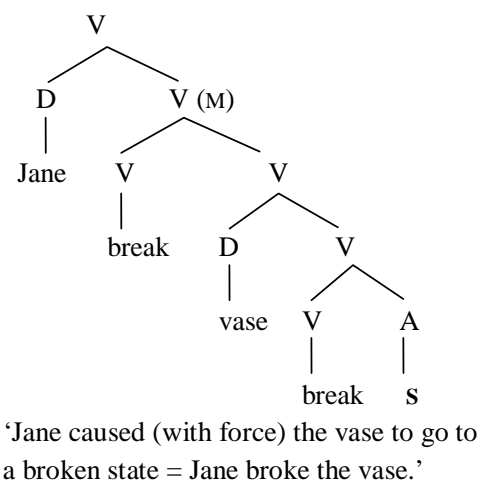
To sumarise, theories share the conception that a-str carries the information about the number and type of arguments associated with a head predicate. They diverge, however, in the precise detail of the conception and therefore in the representation of a-str. In the projectionist approach, the mechanism of the projection varies depending on whether syntax and lexicon are conceptualised as separate or not. In a constructional approach, an a-str is strictly speaking not lexical. We will adopt the middle ground, however, in recognising the complex interplay between lexical and constructional aspects of a-strs, which is discussed further in the ensuing sections.

3 A lexical-constructional approach to a-str operations

In what follows, we pursue a lexical-constructional approach to a-str operations. That is, we adopt an analysis that incorporates the insight from the construction approach to grammar, but not abandon the lexicalist notion that the lexical information, carried by a predicate, determines syntax.

How to capture the precise relationship between surface syntactic structures and semantic structures in a unifying framework that combines cross-linguistic commonalities or (near) universals, as well as language specific peculiarities and regularities is a fascinating question that any linguistic framework must address. This question has been subject to intense research and debate across theories. We address two perennial questions formulated in (21).

(21). a. To what extent is the syntactic realisation of an argument idiosyncratic or predictable and, if it is predicable to what extent is this based on the lexico-semantics of the predicate, or determined by the larger construction that it is a part of?

b. How can alternative argument realisations of arguments associated with same or morphologically related word forms be accounted for in a non-redundant manner?

We pay particular attention to the role of morphology. We discuss types of operations on the basis of whether there is a morphological distinction, whether the effect is on the lexical meaning and/or syntax, and how syntactic (or constructional) patterns themselves might also interact with lexical argument structures.

3.1 Lexical and constructional projections

There has been a debate in relation to (21)a with both extreme stances: strictly lexical vs. strictly constructional. In a lexically-driven approach (derivational as in MP or non-derivational as in LFG and HPSG), syntax is projected from the lexicon; i.e. information determining syntactic argument structure is specified in the lexical entry of the head predicate. We refer to this as lexical syntactic projection. The opposite stance is the one where the verb does not carry syntactic a-str. It receives its a-str from the construction it appears in. The constructional pattern can be of different kinds, possibly schematic. We refer to this as constructional syntactic projection.

On the basis of cross-linguistic evidence, we show that lexical and constructional projections interact in a complex way. It is therefore reasonable to adopt the 'middle' stance. While there is no denying the significance of a constructional projection, there is evidence that when the two projections compete, the lexical projection wins over the construction projection (see the discussion in relation to examples (32) below).

The term 'projection' is used in at least two senses in the literature, so deserves a brief comment. In the first sense, it refers to the (structural) mechanism of how a (sub-)unit of a structure determines or constrains a larger (syntactic) structure which it is itself a part of, or a structure it is related to. Relevant here is the notion of syntactic head – the main unit that determines the configuration of the whole extended structure (see Corbett, Fraser, and McGlashan 1993, for issues in relation to heads across theories). In the second sense, used in LFG, projection is also called correspondence, the mapping mechanism between parallel layers of structures, e.g. between lexical conceptual structure (LCS) and argument structure, or between a-str and (grammatical) functional structure (f-str) or constituent structure (c-str).

The mapping can be (morpho-)lexically determined taking place in the lexicon and/or constructionally determined (i.e. with constraint originated from outside lexicon). Morpho-lexically determined mapping has been amply discussed in the literature (see … and …, amongst others). This includes voice alternation with voice morphology, where a passive verb for example emerges from the lexicon with its patient mapped onto subject and agent mapped onto oblique; further discussed in sections 5.2-5.3.

However, we will see that linking can also be determined at the constructional level. This is the case in languages showing passive without passive morphology as in Manggarai in (3). Thus, the construction 'projects' the linking to the a-str of the verb; further elaborated in section 3.3 below.

3.2 Morphologically marked operations

For morphologically-marked lexical operation (which affects the projection), a distinction has been made between morphosyntactic and morpholexical operations (Levin and Rappaport Hovav 1998; Sadler and Spencer 1998). This depends on whether or not the lexical conceptual structure (LCS) of the predicate is affected by the operation.

Morphosyntactic operations are 'meaning-preserving' morphological processes. That is, it affects argument structure and therefore surface syntactic realisations of arguments while essentially not changing the LCS of the predicate, or not creating a new LCS. Passivisation as in (1)-(2), for example, has the effect of removing the agent from its most prominent position in the argument structure, rendering it either unexpressed or expressed as an oblique in the surface syntax. If unexpressed, the agent remains part of the meaning of the verb (i.e. implied agentivity). In short, the active and derived passive verbs share the same LCS. Passivisation is typically a meaning-preserving operation.[2]

Austronesian languages of Taiwan and Philippines have rich voice systems which can be regarded as morphosyntactic, not changing the LCS. A voice type selects a particular argument as the syntactic subject or Pivot, and affects argument structure (i.e. the valence) of the verb. For example, actor voice (AV) in Puyuma (Teng 2008) -- an Austronesian language of Taiwan with a four-way voice system -- selects the agent as grammatical subject as in (22)a. This AV structure is syntactically intransitive with the patient appearing as an oblique. Patient voice (PV) (22)b, locative voice (LV) (22)c, and conveyance voice (CV) (22)d select a non-agent role as subject. These non-AV types are syntactically transitive: the agent is a core argument realised as a proclitic (*tu=*) and the selected non-actor is the subject appearing in nominative (NOM) case.

(22). a. *tr<em>akaw*   *dra*   *paisu*   *i*   *isaw*   (Puyuma)
             <AV>steal   ID.OBL   money   SG.NOM   Isaw
             'Isaw stole money.'

     b. *tu=trakaw-aw*   *na*   *paisu*   *kan*   *isaw*
             3.GEN=steal-PV   DF.NOM   money   SG.OBL   Isaw
             'Isaw stole the money.'

     c. *tu=trakaw-ay=ku*   *dra*   *paisu*   *kan isaw*
             3.GEN=steal-LV=1s.NOM   DF.NOM ID.OBL   money   SG.OBL Isaw
             'Isaw stole the money from me.'

     d. *tu=trakaw-anay*   *i*   *tinataw*   *dra*   *paisu*
             3.GEN=steal-CV   SG.NOM   his.mother   ID.OBL   money
             'Isaw stole the money from me.'   (Teng 2008:109)

There is evidence that voice alternations of the type exemplified in Puyuma are morphosyntactic: they are syntactically motivated (Teng 2008). In control or raising structures, for example, only syntactic subject/pivot can be gapped in the embedded clause.

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[2] There are certain types of passive which might be also morpholexical in addition to morphosyntactic, e.g. the so-called adversative (or accidental) passives.

Voice morphology plays an important role in the grammar for this, as evident from the following examples:

(23). a. *ma-ladram=ku*   *kana*   *kuraw*   [*dra*   *tu=lriputr-aw*   _   *dra*   *bira*]
           AV-know=1s.NOM   DF.OBL   fish   [COMP   3.GEN=wrap-PV   ID.OBL leaf
           'I know that the fish was wrapped in a leaf.'

      b. * *ma-ladram=ku*   *dra*   *kuraw*   [*dra*   *tu=lriputr-anay*   _   *dra*   *bira*]
           AV-know=1s.NOM   ID.OBL   fish   [COMP 3.GEN=wrap-CV   ID.OBL   leaf
           'I know that the fish was wrapped in a leaf.'   (Teng, p.c.)

      c. *ma-ladram=ku*   *kan*   *pilay*   [*dra*   *me-lriputr*   _   *dra*   *kuraw*   ]
           AV-know=1s.NOM   SG.OBL   mother [COMP AV-wrap   ID.OBL   fish
           'I know that mother wrapped fish.'

The contrast in (23)a-b shows that the raised argument, 'the fish' (realised as the matrix oblique), must be the grammatical subject of the embedded clause (indicated by a gap). For this to be acceptable, because the fish is the Patient of the verb 'wrap', the downstairs verb must be in Patient Voice (PV) as in (23)a, not in Conveyance Voice (CV) as in (23)b. When the Actor is raised, it is expected that the embedded verb is in Actor Voice, which is confirmed as seen in (23)c.

      In contrast to morphosyntactic operations, morpholexical operations are meaning-changing. They affect the LCS of the base, typically by composing the component parts of LCSs of the morphemes. For example, from the intransitive base verb *datang* 'come' (24)a, we can form the transitive causative verb with the suffix *–kan*. The derived verb appears in its actor voice (AV) structure, (24)b:

(24). a. *Polisi*   *datang.*
           police   come
           'The police came.'

      b. *Mereka*   *men-datang-kan*   *polisi*
           3p   AV-come-CAUS   police
           'They called the police to come (lit. caused police to come).'

      As noted, like a morphosyntatic operation, a morpholexical operation may also affect the projection of the argument of the base predicate. The sole argument (*polisi*) of the base intransitive verb is subject in (24)a but is a causee, projected as object in the causative structure (24)b.

3.3   Lexical-constructional operation without morphology

      Derivational processes with distinct morphology as exemplified so far show good evidence for the idea of syntactic (argument) structures being projected from the lexicon. We have seen morphological causativisation as an instance of the projection of morphology to syntax. It shows how a morpheme affects the LCS and the a-str of the base, and consequently affects the syntactic realisation of the arguments of the base.

      However, argument alternations may involve no distinct verbal morphological marking. We have seen passives without verbal passive morphology in languages like

Manggarai in (3). We also know that the same verb form *break* in English can be used intransitively and transitively. The *spray-load* alternation in English also involves no distinct morphology.

Systematic alternations without morphology pose a theoretical challenge, particularly for theories that assume overt verbal markings as an indication of certain syntactic (lexical) operations. Given the same verb form, how can we know that that there is already a certain operation taking place, by which when projected to syntax, one structural option is to be selected instead the other(s)?

In Levin and Rappaport Hovav's (Levin and Hovav 1995: 83, 108-110) analysis, the transitive-intransitive alternation is the case of anticausativisation, rather than causativisation; that is the transitive variant is basic. Evidence for this comes from the fact that intransitive verbs which do not participate in this (anti)causative alternation such as *laugh* are inherently monadic predicates whereas the alternating verbs of the *break* type such as *break, bend, fold, shatter, crack* are dyadic causative verbs.

In Levin & Rappaport Hovav's analysis, the *break* and *spray-load* alternations are instances of 'polysemy': the same form can be associated with more than one a-str and LCS. The transitive verb *break*, for example, has the LCS and a-str shown in (25), where the causer x is the external argument realised as subject whereas the thing broken (y) is the second internal argument realised as object.

(25). *Transitive break*:

LCS	[[x do-something] CAUSE	[y become BROKEN]
Linking rules	↓	↓
argument structure	x	<y>

The intransitive *break* is derived from the transitive counterpart in the sense that it also has the same underlying LCS but there is a *lexically binding process* represented by ∅ in (26) before the linking. The causer (x) is therefore not available for linking to the a-str, and cannot be projected to the syntax. As a result, only the thing broken (y) is linked to the internal argument, realised as the sole (subject) argument.

(26). *Intransitive break*:

LCS	[[x do-something] CAUSE [y become BROKEN]
	↓
lexical binding	∅
Linking rules	↓
argument structure	<y>

Rappaport Hovav and Levin (2011), however, change their analysis, and consider the intransitive variant as basic but the causative variant is not derived from the intransitive variant. Rather extra lexical factors determine the causative variant. In a sense, they recognise the 'constructional projection', how information from the semantics of the NP arguments in syntax feeds back to the (re)formation of the a-str of the predicate.

Boas (2003) working within the construction grammar framework also treats *break* as a case of the same verb possibly entering different syntactic-semantic frames without

derivation: neither is derived from the other. Note that in Boas' analysis, unlike in Rappaport Hovav and Levin's (2011), the intransitive variant is not basic. Pykkänen (2008), working within a Chomskyan framework, also argues for the same point of analysis of not deriving one variant from the other.

Whatever the framework, there must be some mechanism of constraint for Patient profiling for the intransitive use whereby the entity exerting the energy (agent/causer) is (obligatorily) absent and the sole argument, the patient, is realised as subject:

(27). a. *Mary broke.*
b. *The vase broke.*

It has been pointed out earlier that the properties of the arguments also constrain the option of a-strs (cf. the causativisation in relation to English (10) and Indonesian (11)-(12)).

Let us further consider how a similar constructional analysis is most applicable to highly isolating languages such as Manggarai and Rongga (Austronesian languages of Flores, Indonesia). In these languages, there is no morphology whatsoever in the systems. All productive syntactic alternations are therefore achieved constructionally. Thus the verb *nggoli* 'roll' appears intransitively as an anticausative or passive as in (28)a, middle as in (28)b, or transitively as in (28)c.

(28). a. *Watu   ndau   nggoli*   (Rongga)
     stone   that   roll
     'The stone rolled (or was rolled)'

   b. *Jao   nggoli*
      1s   roll
      'I rolled (myself)'

   c. *Ja'o   nggoli watu   ndau*
      1s   roll   stone   that
      'I rolled the stone or I made the stone roll'

A purely lexical analysis with lexical derivational rules would be counter intuitive and inelegant. In this analysis, same forms would have multiple lexical a-strs. Adopting a lexical rule, as in the *break* type in English, we are faced with a directional problem of derivation. Given *nggoli₁* (transitive) and *nggoli₂* (intransitive), the LCS/a-str of which verb should be regarded as the input/basic or the output/derived?

In the alternative (proposed) constructional projection analysis, the derivational problem is eliminated. Let us consider how the proposal works to account for the data in (28).

First of all, the lexical entry of the verb *nggoli* simply carries the LCS shown in (29), without lexical a-str. The LCS notation y<ROLL>, following (Levin and Rappaport Hovav 2005), abbreviates a complex conceptual meaning of 'rolling' possibly with implicit direction.

(29).   *nggoli* V LCS: y<ROLL> 'y turns over and over moving in a particular direction'

Secondly, the grammar of Rongga specifies transitive and intransitive constructions with their respective linkings across layers. The transitive and intransitive constructions may be of different types. The ones encoding the CAUSE-MOTION semantics are shown in (30). Importantly, these construction types project their own constructional a-strs and

linkings. The linkings are shown by the lines below. To contrast it with lexical a-str, the constructionally projected a-str is distinctly labelled as const.a-str in (30).

(30). a. Transitive CAUSE-MOTION construction:
    LCS: AFFECT ([x]   [y<MOTION>]
                                  | |
    constr.a-str: < (agent) (patient)>
                                 /   \
    syn: NP:SUBJ   V   NP:OBJ

    b. Intransitive CAUSE-MOTION construction:
       LCS: (i)   AFFECT ([x], [y<MOTION>])   (ii) AFFECT([ ],[y<MOTION>])
                                    |__| |
       constr.a-str: < (agent)>   <(patient)>
                                    | |
       syn: NP:SUBJ V   NP:SUBJ   V
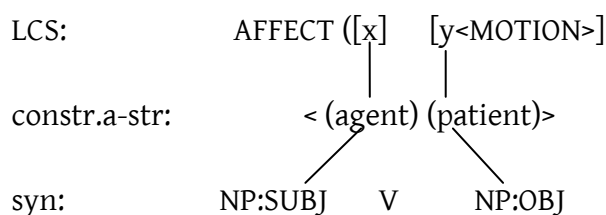
A predicate in Rongga, in this constructional projection analysis, receives its syntactic argument structure (i.e. const.a-str) from the construction where it is a part of. Thus, when the verb *nggoli* 'roll' is inserted into the transitive frame (30)a, its LCS unifies with the compatible semantic unit, i.e. y<MOTION> = y<ROLL>. *Nggoli* then acquires a transitive a-str with agent and patie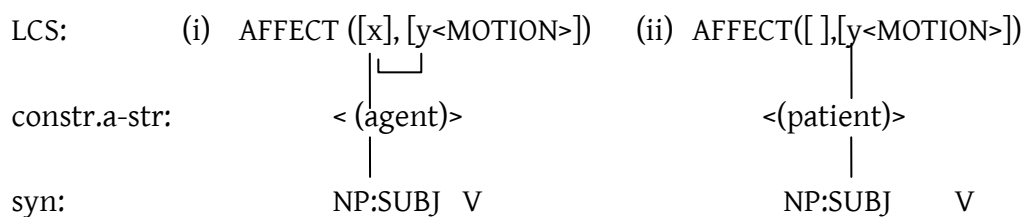nt arguments linked to subject and object respectively, giving rise to sentence (28)c. Appearing within an intransitive frame, there are two possibilities depending on the properties of the roller argument. If it is an inanimate thing understood to be unable to exert energy by itself to cause the rolling, then it is understood as patient-like, giving rise to the structure shown in (30)b.ii. However, if it is animate, it's ambiguous between (30)b.i and (30)bii.

The advantage of constructional projection is that it can capture the fact that structures carry meaning. In addition, systematic a-str alternations without specific morphology as seen in Rongga are natural and expected. In English, examples of the type shown in (31) further show that the constructional projection augments the lexical a-str of the verb *sneeze*, which is a one-place predicate as in (31)a, to become a three-place predicate as in (31)b (Goldberg 1995: 154).

(31).   a. *Frank sneezed.*
           b. *Frank sneezed the napkin off the table.* (Goldberg 1995: 154)

It appears that lexical properties of the head predicate are essential for the construction projection to be operable. The evidence comes from the downgraded acceptability of the sentences shown in (32) (Boas 2003: 111). That is, not all verbs of emission can be inserted into the same cause motion frame, resulting in valence augmentation.

(32).   a. ?   *Frank breathed the napkin off the table.*
           b. ?? *Frank wheezed the napkin off the table.*
           c. ?? *Frank yawned the napkin off the table.*

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To conclude, valence alternations are not necessarily morphologically marked, but possibly constructionally determined. However, inherent lexical force dynamics of the head predicate also determines the degree of acceptability of certain constructionally projected a-strs. We further show in the next subsection how morpholexical projection interacts with constructional projection.

3.4 Morpho-constructional operations

In this subsection, we see a case where a morpholexical projection may only partially determine the linking of arguments of a predicate's a-str, and leave the constructional projection to complete for the full linking. This is exemplified by non-active voice *di*-verbs in Indonesian in (33) (Arka and Manning 2008). The point is that, in contrast to the AV prefix *meN-* (33)a, the prefix *di-* is ambiguous at the lexical level: the *di-* verb can appear in UV (Undergoer Voice) and in PASS voice. The UV or PASS variant is determined by the larger structure where it is in, depending on whether the agent is realised as a clitic as in (33)b or a PP as in (33)c.

(33). a. *Amir*   *tidak*   *mem-perhatikan*   *saya.*   (Actor Voice)
      Amir   NEG   AV-care   1s
      'Amir didn't care for me.'

    b. *Saya*   *tidak*   *di-perhatikan=nya.*   (Undergoer Voice)
      1s   NEG   DI-care=3s
      'S/he didn't care for me.'

    c. *Saya*   *tidak*   *di-perhatikan*   *oleh*   *Amir.*   (Passive Voice)
      1s   NEG   DI-care   by   Amir
      'I was not cared for by Amir.'

The Agent of the UV *di*-verb (34)b is syntactically the direct core argument whereas the agent of PASS (34)c is syntactically oblique. The following contrast shows that the agent of [*di*-verb=clitic] behaves differently from [*di*-verb PP] suggesting that they are two distinct structures despite sharing the same *di*-verb form (Arka and Manning 2008):

(34). a. *Dirinya*   *tidak*   *di-perhatikan=nya.*
      self.3   NEG   DI-care=3s
      'S/he didn't care for herself/himself.'

    b. ?* *Dirinya*   *tidak*   *di-perhatikan*   *oleh*   *Amir.*
      self.3   NEG   DI-care   by   Amir
      'Himself was not cared for by Amir.'

The fact the *di*-verb can appear in two distinct voice types (33) exemplifies how morpholexical and constructional projections interact in a-str alternations. The morpholexical linking marked by *di-*, only partially encodes the argument linking, namely the linking of U as core/subject argument. The constructional linking specifies the linking of U as a core argument when it is a pronominal clitic (=*nya*), or as an Oblique when it is a PP (*oleh Amir*).

Having distinguished morpholexical projections from constructional projections, we now further discuss linking, looking at the conception more closely and the mechanism of linking across theories.

4   Linking across theories

The term linking or mapping refers to form-meaning association whereby the identification of participant/argument roles (i.e. the idea of who did what to whom) in a state of affairs is traceable. The association is regular, not only within a language but also across languages; which gives rise to linking regularities (Carter 1988). The details for linking vary across theories, depending on how 'form' and 'meaning' are conceptualised and modelled and how direct the linking is. However, they all share the idea that linking is regulated by a prominence-matching principle of items across structures. For example, the causing participant (typically identified as agent) is linked to the grammatical subject; that is, the most prominent argument in semantics is linked to the most salient grammatical unit in syntax.

In this section, we first sketch linking in LFG (4.1), then in Minimalism (4.2) and then in Construction grammar (4.3).

4.1   Lexical Functional Grammar (LFG)

There are different versions of linking theory in LFG. In a version called LMT (Lexical Mapping Theory), linking principles map argument structures onto syntactic functions in functional structures (f-str). An argument structure in LMT is represented as a predicator with argument thematic roles (e.g. *agent* and *patient,* as in (35) for *hit* in English) showing prominence indicated by left to right order reflecting a thematic hierarchy shown in (36). (Thematic labels are understood as abbreviations for a finer-grained semantic analysis, e.g. as in Dowty (1991).)

(35). 'hit < agent patient>'

(36). Thematic Hierarchy (Bresnan and Kanerva 1989):
   Agent < Benefactive < Goal/Experiencer < Instrumental < Patient/ Theme < Locative
   < ...

Grammatical functions (GFs) such as SUBJ and OBJ are not primitive in LMT. They are decomposed by means of two binary features, +/- r(estricted) and +/- o(bjective) (37)a, giving rise to natural classes shown in (37)b.

(37). a.

GFs	Features	b.	Features	GFs
SUBJ	[-r, -o]		[-o]	SUBJ, OBL
OBJ	[-r, +o]		[+o]	OBJ, OBJ_θ
OBJ_θ	[+r, +o]		[-r]	SUBJ, OBJ
OBL_θ	[+r, -o]		[+r]	OBJ_θ, OBL_θ

The same features also used to differentiate thematic roles. For example, agent and locative are intrinsically [-o] (i.e. not object-like) and patient/theme is intrinsically [-r] (i.e. alternating between SUBJ and OBJ):

(38). Intrinsic classification (IC):

  a. agent   b. patient/theme   c. locative

        | | |
      [-o]   [-r]   [-o]

Since both thematic roles and grammatical functions are classified by the same [+/-r] and [+/- o] features, the features then mediate the mapping between roles in the a-str and grammatical functions. Importantly, underspecified features such as [-o] for agent allow us to capture alternative linkings naturally.

(39). a. agent   b. patient/theme
           [-o]   [-r]
            | |
         SUBJ/OBJ   SUBJ/OBJ   (alternative functions)

In addition to IC in (38), LMT comes with other mapping principles given in (40) and (41). The linking system must also be monotonic, meaning the operation cannot change the existing specification/structure, e.g. a role intrinsically classified as [-r] cannot be latter assigned [+r].

(40). Default principles:

  the highest semantic role is by default [-r], and the remaining role is by default [+r].

  a. $\hat{\theta}$ b. θ
       | |
      [-r]   [+r]

(41). Well-formedness conditions:
  i. Subject condition: Each (verbal) lexical form must have a subject.
  ii. Function-argument biuniqueness: Every expressed argument must be associated with a unique function, and vice versa.

To illustrate the linking, consider the a-str of the English *chase* in (42)a. The mapping principles (IC, Default, and well-formedness) map the agent onto SUBJ and patient onto OBJ. Note that patient [-r] allows it to be linked to SUBJ/OBJ but because the agent outranks it for the subject selection (due to (39)a), the patient can only be linked to OBJ.

(42). a. *a-str:*   'chase< agent patient>
                              | |
                            [-o]   [-r]   (IC)
                            [-r]   (default)
                              |
        b. *gr-str*:   SUBJ   OBJ   (well-formedness)

Alternative argument realisations and valence-changing processes such passivisation, reciprocalisation and applicativisation are analysed as operations on argument structures. Passivisation is the suppression of the most prominent argument (agent) from the a-str represented in (43)a. Applicativisation is the addition of a new argument to the a-str, (43)b.

Valence-reducing reciprocalisation co-indexes arguments by which the second argument is suppressed, as shown in (43)c.

(43). a. Passive   b. Applicative   c. Reciprocal

$$\hat{\theta} \qquad\qquad \theta \qquad\qquad\qquad <\theta_i \ldots \theta_{i}..>$$
$$| \qquad\qquad\quad | \qquad\qquad\qquad\qquad |$$
$$\varnothing \qquad\quad < \;\theta appl\ldots> \qquad\qquad \varnothing$$

As an illustration given in (44), *ter-* in Indonesian turns the transitive root *lihat* 'see <exp, th>' into an intransitive verb, *ter-lihat,* by removing the most prominent argument (*exp*) from the a-str. *Ter-* is definitely a passive prefix, unlike *di-* which can be associated with passive or undergoer voice in Indonesian as seen in (33)-(34). The <th> argument is then SUBJ by virtue of being [-r] when the most prominent argument is suppressed:

(44).   *Gunung   itu   tidak   ter-lihat   ter-lihat* 'PASS-see< exp , th>
       mountain   that   NEG   PASS-see $\varnothing$ [-r]
       'the mountain is not seen.'   SUBJ

Argument alternations in syntactically ergative languages, in inverse systems e.g. Mapudungun (Arnold 1997), and in symmetrical systems in many Austronesian languages also pose a challenge in any linking theory, including LMT. These languages, unlike syntactically accusative languages like English, show a property where an agent as the most prominent argument is not by default mapped onto grammatical subject (i.e. against the prediction of prominence-based linking theory).

A serious problem for LMT is regarding the realisation of the agent due to its intrinsic classification as [-o]. This predicts that the agent can only alternate between subject and an oblique. The reality in many Austronesian languages is that the actor-like argument remains highly salient, grammatically a core object-like argument in the UV structure as discussed earlier in Indonesian (33). More UV examples are given below from Pendau in (45) (Quick 2007) and Balinese in (46).

(45). a. *Japing   uo   nisambale   ni=Yusup   nu=piso.*   (Pendau)
       cow   that   UV.RE-butcher   PN/GE=Joseph   INSTR=machete
       'Joseph butchered that cow with the machete.'

     b. *Si=Yusup   monyambale   japing   uo   nu=piso.*
       PN/AB=Joseph   AV.IR.butcher   cow   that   INSTR=machete
       'Joseph will slaughter the cow with a machete.' (Quick 2007: 144)

(46). a. *Bawi-ne   adol   ida.*   a'. * *Bawi-ne   adol*   (Balinese)
       pig-DEF   UV.sell   3
       'The pig, (s)he sold'

     b. *Ida   ng-adol   bawi-ne*   b'. * *Ida ng-adol*
       3   AV-sell   pig-DEF
       '(s)he sold the pig.'

The UV actors *Yusup* in (45)a and *Ida* in (46)a are obligatorily present and syntactically not obliques. The UV structures are, like their AV (actor voice) counterparts in (b) sentences, syntactically transitive.

One way of accounting for facts of the kind exhibited by Austronesian languages exemplified above (and related behavioural properties such as binding) is to have a different linking mechanism within LFG, built on a syntacticised a-str conception (Manning 1996; Arka 2003). In what follows, the nature of the proposed a-str is outlined first; then the mapping mechanism is discussed.

The proposed syntacticised a-str specifications are given in (47). It is called syntacticised a-str because the a-str carries important syntactic information such as termhood/coreness; further discussed below.

(47). Syntacticised a-str:
- a. It carries information about the syntactic valency of a predicate (i.e. number of arguments: one-place predicate, two-place predicate, etc.)
- b. It carries information whether an argument is a core/term or not; hence syntactic transitivity: intransitive, monotransitive, etc.)
- c. It contains syntactic arguments having the following prominence:
  (i) core arguments outrank non-cores
  (ii) within sets of cores/non-cores, prominence reflects semantic prominence

Arguments in the a-str are listed simply as slots as shown in (48), from left to right reflecting ranking on basis of core and thematic prominence (47)c. (48) says that it is a three-place predicate with two core arguments and one non-core argument. The vertical bar (|) differentiates the core from non-core arguments, with the core group on the left and non-core group on the right of the bar, signifying the core outranks the non-core.

(48). a-str: 'pred < − , − | − >'

The arguments within each group (core and non-core) are ranked on the basis of their thematic prominence, determined by their association with the LCS. For example, the default a-str and LCS of the verb *put* in English has a lexical entry that can be represented in (49)a. The arguments in the a-str from the left to right are understood as agent, theme and locative respectively. The representation in (49)a can be abbreviated as (49)b.

(49). a. English *put*:

a-str: 'put < − , − | − >'

LCS: [x ACT] AFFECT [y BECOME IN<PLACE>]
            (agent)   (theme)   (locative)

b. a-str: 'put < − , − | − >'
                 (ag)(th)(loc)

For simplicity, the slots in the a-str may also be directly labelled with semantic roles. For direct core arguments we use generalised role labels used by typologists such as A 'transitive actor', P 'transitive patient', G 'ditransitive goal/recipient' and T 'ditransitive theme'. The representation in (49)b can be alternatively further abbreviated as (49)c:

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c. 'put<A, P | loc >'

The reason why we register the coreness in the a-str is that the core status of an argument, and therefore its possible realisation in syntax, is not totally predictable from the semantics of the predicate. For example, the locative argument of the English *put* in an obligatory oblique is captured by the representation in (49) with locative without brackets. In many other languages, the locative of the equivalent verb is an optional (implicit) argument:

(50). a. *Tiuk-e*   *suba*   *jaang*   *cang.*   (Balinese)
     knife-DEF   already   UV.put   1
     'I already placed the knife (e.g. in its place).'

    b. *Cang*   *suba*   *ng-jaang*   *tiuk-e.*
      3   already   AV-put   knife-DEF
      'I already placed the knife (e.g. in its place).'

Balinese *jaang* 'put/place' can therefore be represented as having the a-str shown in (51)a, where the last argument is placed within brackets. Likewise, the Balinese verb *baang* 'give' is strictly ditransitive, not allowing a transitive-ditransitive (dative) alternation as in its English equivalent *give* (e.g. *John gave a book to Mary* vs. *John gave Mary a book*). Balinese *baang* can therefore have only one a-str as shown in (51)b: the goal/recipient argument is registered as a direct core argument only. In contrast, *give* in English would also allow a ditransitive a-str like Balinese *baang* in (51)b, in addition to a three-place transitive structure like *put* (49) with the last argument being the goal oblique. (In this analysis, Balinese *baang* 'give' (with only one a-str) and English *give* (with two possible a-strs) are arguably associated with the same LCS).

(51). Balinese
     a.   *jaang* 'place/put':   b.   *baang* 'give'
        a-str: 'put < − , − | (−) >'   a-str: 'give < − , − , − >'
                  (ag)(th)(loc)   (ag)(go)(th)

The a-str outlined in (47) is an intermediate structure between semantics (LCS) and surface grammatical functions such as SUBJECT and OBJECT in syntax. Mapping from a-str to surface grammatical function (gf-str) (called f-mapping) is subject to parametric variation whether the grammatical system is accusative or ergative and whether the system allows symmetrical mapping, or not. Simplifying somewhat by ignoring complex complement functions, we can formulate the mapping principles as follows (Arka 2003):

(52). F-mapping:

     I. Subject selection
       a. Intransitives:
          Map the only core argument to SUBJECT

       b. Transitives:
         (i)   Accusative mapping:
             Map the first or highest core argument onto SUBJ

       (ii) Ergative mapping:
   Map a non-highest core argument onto SUBJ

  II. Non Subject selection
     a. Map any remaining core arguments onto OBJs
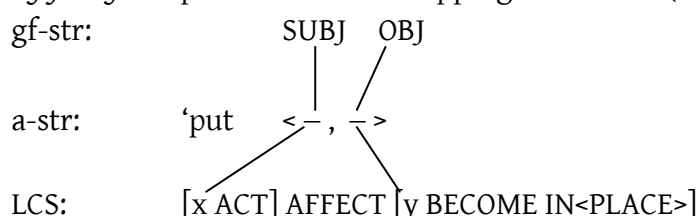   b. Map non-core arguments onto OBLs

Having outlined the a-str and the mapping principles, we can now account for problematic cases of argument alternations in Austronesian languages of the type shown in Pendau (45) and Balinese (50) where the agent is not subject and neither oblique in the UV structures.

When considering the Balinese AV-UV examples in (50), one thing to bear in mind with voice in this language and many other Austronesian languages is that the system is symmetrical, in the sense that all voice types are equally morphologically marked and that (core) arguments can be equally mapped onto SUBJ without the demotion of the other core argument. Thus, for a transitive base, both the 'accusative' and 'ergative' mappings (52)b are equally morphologically marked. In Balinese, the ∅- marks the ergative mapping and the AV prefix *N-* marks the accusative mapping. Sentences in (50) can therefore be represented as having the following a-str and mapping:

(53). a. *∅-jaang* 'UV-put': ergative mapping   (= sentence (50)a)

gf-str: SUBJ   OBJ

a-str: 'put   < – , – >

LCS: [x ACT] AFFECT [y BECOME IN<PLACE>]
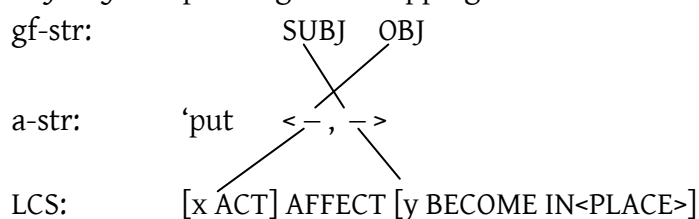
  b. *ng-jaang* 'AV.put': Accusative mapping   (= sentence (50)b)

gf-str: SUBJ   OBJ

a-str: 'put   < – , – >

LCS: [x ACT] AFFECT [y BECOME IN<PLACE>]

The representation in (53) captures the fact that the AV-UV alternation does not involve a change in syntactic transitivity because both voices are transitive, sharing the same a-str. The only difference is the f-mapping, where the accusative mapping shows a cross linking. The evidence that the agent remains the highest core in the UV structure in Balinese and Indonesian comes from a range of properties including reflexive binding (Manning 1996; Arka 2003).

Argumentation realisations so far discussed, including voice alternations in Austonesian languages, are basic alternations which any linking theory must be able to handle. However, there are challenges when linking involves complex three-place predicates. These predicates may involve predicate composition with complex morphology. Non-actor arguments in three-place predicates are treated differently across languages,

resulting in variations in double object structures (Bresnan and Moshi 1990; Alsina and Mchombo 1993; Bresnan 2001).

4.2 Minimalist Program

Chomskyan Minimalist Program, (Chomsky 1993, 1995, 2000, 2001) like its predecessors (Government Binding (GB) and Principle and Parameters (PP)) continue the search for a theory of UG by which human language and the language faculty can be explained. The executions of the theory or theories within the Chomskyan frameworks including the conceptions of argument-structure and linking vary greatly among the authors working within the framework(s). In the earlier versions (GB and PP), where grammar was modular with the distinction between D-structure and S-structure (i.e. surface syntax), a lexical entry carried a theta-grid showing an argument array, theta role, and a kind of 'linking' between syntactic arguments and theta roles. Current work within MP that maintains linking is Reinhart's Theta System (Reinhart 2002; Reinhart and Siloni 2005). In her system, there is a clear separation between operations in the lexicon and syntax, and the argument structure in the lexicon contains the information about theta role information. The external and internal roles are expressed by indices 1 and 2 respectively as seen in (54) for the verb *wash*.[3] The intransitive reflexive *wash* is achieved by means of 'bundling' formulated in (54)b. The bundling operation results in the intransitive verb *wash* shown in (54)c, which carries a complex role (i.e. agent understood as theme). It also renders the verb to be unable to assign ACC case. The bundled complex role is then assigned to the external argument, as in sentence (54)d.
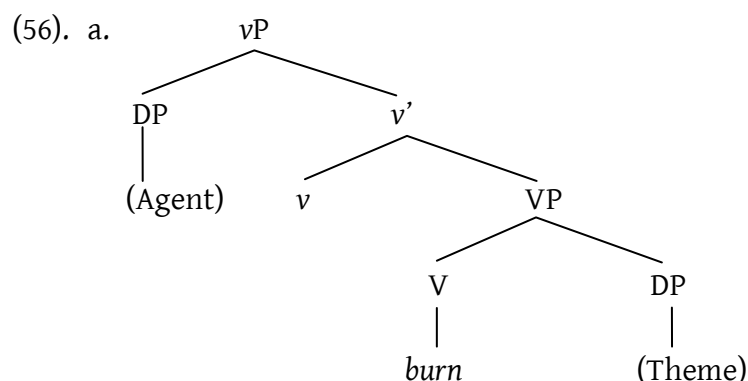
(54). a. Verb entry $wash_{acc}$ $[agent]_1$, $[theme]_2$

   b. Reflexivisation bundling:

     $[\theta_i][\theta_j] \rightarrow [\theta_i - \theta_j]$, where θ_i is an external θ–role.

   c. Verb entry $wash[agent\text{-}theme]_1$

   d. Syntactic output: Max $_{[agent\text{-}theme]}$ washed.

Authors working with MP, however, commonly adopt the analysis that (alternative) argument realisations are explainable without a linking theory. This analysis assumes that the interpretation of (external) arguments is structurally derived via a verbal head (under the influence of Hale and Kyser 1993). We have seen how aspectual interpretation of (proto-)agent is structurally derived in relation to the projection of 'activity' (Erteschick-Shir 2007); see (18)-(20) earlier. Other versions of extra verbal heads include *v*P (little v) (Chomsky 1995) and VoiceP (Kratzer 1996). The little *v* (or *voice)* may have different semantic flavours (Folli and Harley 2007), associated with the primitive CAUSE giving rise to 'causer' or 'agent' interpretation. The unit *v*P or VoiceP is structurally represented as higher, taking VP as its complement. This captures the prominence of the external argument as a causer/agent. In

---

[3] The thematic labels are abbreviations of atomic features of [+/- c(ause change) and [+/- m(ental state relevant)]. The agent is [+c,+m] as it is a causer obligatorily understood as animate (its mental state is relevant), whereas a theme is [-c, -m] (i.e. triggers no change and imposes no animacy restriction). See Reinhart (2002) for further details.
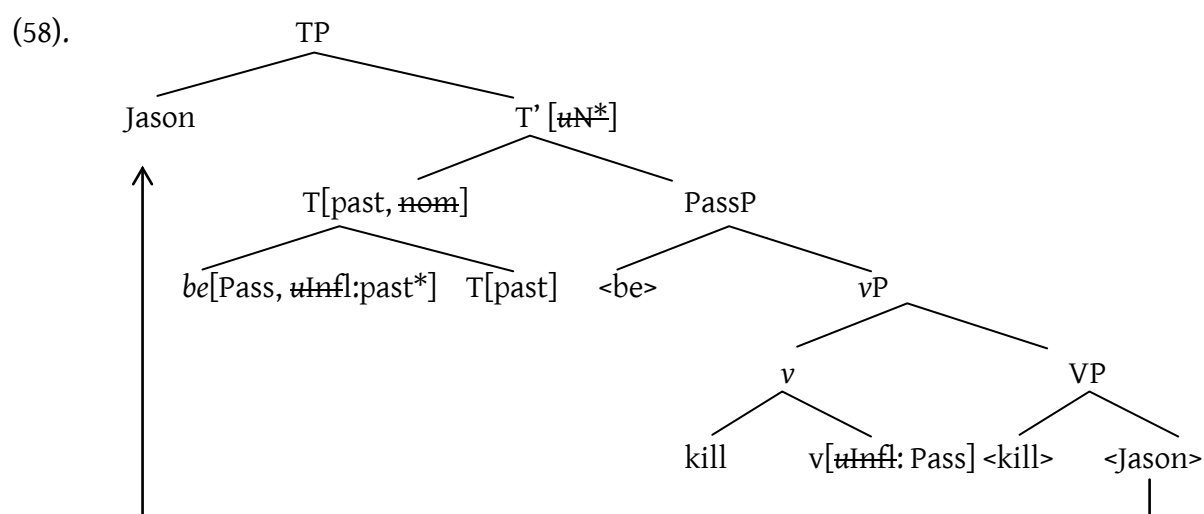
this view, UTAH (Uniformity of Theta Assignment Hypothesis) (due to Baker 1988) is also commonly assumed. Thus, the transitive verb *burn* would have a syntactic argument structure representation shown in (56), which can be roughly paraphrased as 'X (agent) causes Y (theme) to burn'. Because of the UTAH, any transitive verb with Agent and Theme arguments would have this configurational argument structure.

(55). UTAH (Uniformity of Theta Assignment Hypothesis)
 Identical thematic relationships between predicate and their arguments are represented by identical structural relationships when items are merged (Adger 2004) (cf. (Baker 1988)).

(56). a.
```
                    vP
                  /    \
               DP       v'
               |       /   \
            (Agent)   v     VP
                           /  \
                          V    DP
                          |     |
                        burn  (Theme)
```

Argument alternations are then the outcomes of syntactic derivations involving merge (or movement) driven by Full Interpretation (FI) and feature checking requirements as well as other independent principles such as EPP (Extended Projection Principle), which requires that a clause must have a subject. FI is to derive a structure that contains no uninterpretable features such as case. For example, consider the representation of passive sentence (57) in (58), where the theme *Jason* ends up as subject (Adger 2004:229-231):

(57). Jason was killed.

(58).
```
                        TP
                      /    \
                  Jason    T' [uN*]
                          /       \
                   T[past, nom]    PassP
                   /        \      /    \
          be[Pass, uInfl:past*] T[past] <be>   vP
                                              /    \
                                             v      VP
                                           /   \    /   \
                                        kill  v[uInfl: Pass] <kill>  <Jason>
```

The passive derivation can be explained as follow. Firstly, by virtue of UTAH, the patient *Jason* is generated structurally as a complement of the verb *kill* within VP. However, the verb *kill* is passive spelled out as *killed*, represented as the complement of the PassP. A

passive verb is analysed in the same way as an unaccusative verb like *fall* in that it does not assign accusative case to its complement theme. The theme *Jason* has to check [nom(inative)] case with [nom] on T, and therefore has to raise to [spec, TP] so as to satisfy EPP. The feature [nom] on T is represented as having a strikethrough, meaning that it has been checked. Secondly, the phrasal passive spell-out of *was killed* can be described as follows. The passive structure (in English) is analysed as having a passive functional head (PassP) headed by *be*, carrying uninterpretable inflectional feature of Pass. The PassP takes a passive verb, analysed as unaccusative *v*P (hence it comes with *u*Inf:Pass too): the *v*P has no specifier position for the agent and, as mentioned earlier, it does not assign accusative case to its complement theme. When *be* merges with T, the [inInfl: past] is checked, and the merge results in a spell-out of *be* as *was*. When the verb *kill* merges with the vP of passive, the feature [unInf:Pass] is checked and the verb is spelled out as *killed*. In short, these processes of structural merge and movement derive the passive *Jason was killed*.
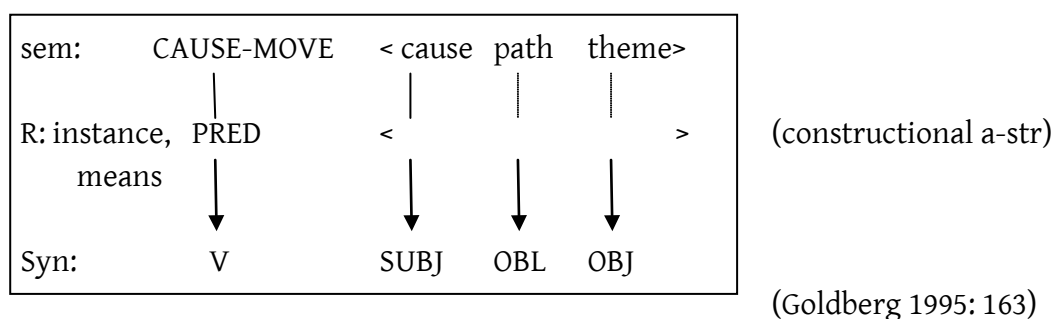
4.3 Construction Grammar

Unlike LFG and MP which highlight the significance of lexical meaning in determining the argument structure, Construction Grammar (CxG) (Goldberg 1995; Croft 2001) emphasises the significance of specific constructional meaning in determining argument structure of a verb. In CxG argument structures are constructional, where roles associated with (head) predicates are also determined by schematic structures or patterns in surface syntax. Linking takes place at the constructional level. A construction-triggered valence augmentation with the verb *sneeze* has been mentioned in section 2. Let us look at the mechanism more closely now.

The English verb *sneeze* is lexically intransitive, as seen in its entry in (59)a. It can instantiate an independent three-place Cause-Motion Construction shown in (59)b. In effect, its valence is augmented with two extra arguments, giving rise to a three-place structure as exemplified in (59)c.

(59). a. 'sneeze <sneezer>'   (lexical a-str)

b. Cause-Motion Construction

sem:	CAUSE-MOVE	< cause path	theme>
R: instance, means	PRED	<	>
Syn:	V	SUBJ OBL	OBJ

(constructional a-str)

(Goldberg 1995: 163)

c. *John*_{SUBJ} *sneezed the napkin*_{OBJ} *off the table*_{OBL}.

The constructional linking shown in (59)b can be explained as follows. The verb's sole argument (i.e. <sneezer>) fuses with the constructional <cause> argument, indicated by a solid linking line in (59)b. It is then realised as subject. The other arguments are licensed by

the Cause-Motion Construction (i.e. path and theme) and are realised as object and oblique, respectively.

This construction-based analysis essentially shares the same idea as a predicate composition analysis involving argument fusion in LFG (Butt 1995; Alsina 1996). CxG makes it explicit that a construction type, in this case 'Cause-Motion Construction', carries its own a-str with which the lexical argument-structure of the verb can fuse.

For certain 'radical' versions of CxG, however, no clear separation between lexicon and syntax is conceived and a verb is considered to have no lexical argument structure. A verb gets its argument structure solely by means of being inserted in a particular syntactic-semantic frame or schematic structure. Linking is all constructional, taking place at different levels of schematic structures: verb-class specific construction, verb-specific construction and individual occurrences (Croft 2001, 2003; Iwata 2008:39).

It should be noted that CxG is, like LFG, a non-derivational theory. One point to note here is the notion of 'fusion', similar to 'unification' used in the mechanism to account for argument alternations. That is, compatible information from different levels of schematic structures fuses or interacts. This allows certain traits of meaning of verbs to enter more than one specific constructional frame (i.e. multiple instantiation). Thus, a passive alternation exemplified in (60) is analysed as a case where the verb *put* can instantiate two constructional frames as shown in (61).

(60).   a. *John put the box on the table.*
         b. *The box was put on the table.*

(61).   Cause-Motion Construction   Passive Construction

(Iwata 2008: 28)
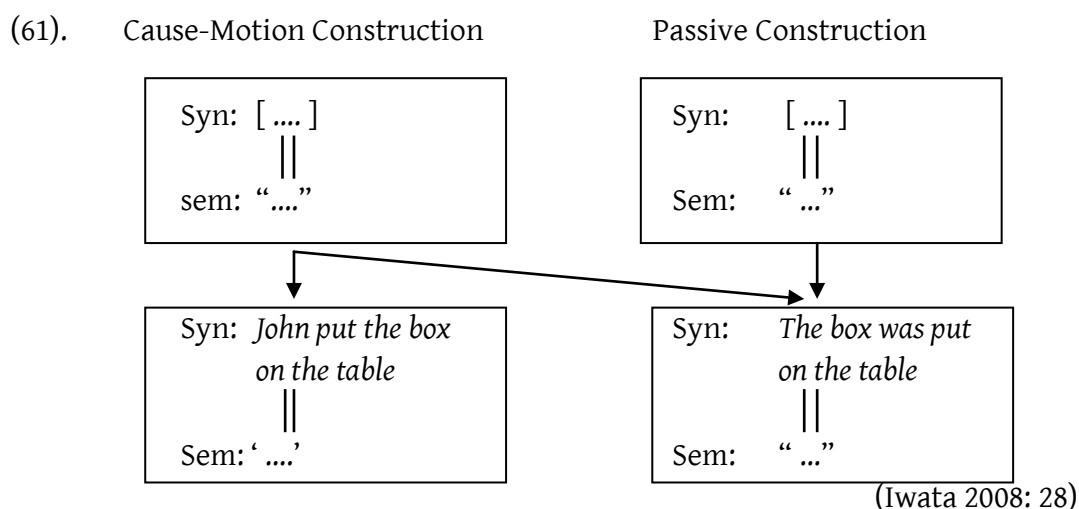
The CxG provides a particularly attractive framework to deal with argument alternations involving valence augmentation with semantic components added by syntactic patterns such as in resultative constructions. Section 3.4 incorporates insights from CxG to account for voice alternations involving *di*-verbs in Indonesian. The conception of the LCS and argument structure distinction is maintained here, so that we can handle subtle and complex issues regarding argument identification such as reflexivisation.

5 Processes affecting argument structure realisations

5.1 Intransitive verbs

Many languages distinguish morphosyntactically between two types of intransitive verbs, agentive intransitives and patientive intransitives. The two are also known as unergatives and unaccusatives respectively, or S_O and S_A (in Dixon's terminology, where S is an intransitive subject). The important point here is that there are often morphosyntactic differences between the two, showing different treatment of S_O and O (direct object of a transitive verb) in contrast to S_A and A (Actor of a transitive verb). Morpholexical and syntactic properties reflecting the split vary across languages.

Verbal inflection may often show the intransitive split, e.g. as in Lakota (see Mithun 1991): *wapsíča* 'I jumped', *waktékte* 'I'll kill him' vs. *maxwá* 'I'm sleepy', *maktékte* 'he'll kill **me**'. Verbal voice in Indonesian languages manifests the split as well, e.g. unergatives and actor voice (AV) transitive verbs in Balinese get homorganic nasal *N-* whereas unaccusative verbs and undergoer voice (UV) receives zero-prefix marking:

(62).   Intransitive: ***ng****eling* (<*N-eling*) 'AV-cry'   vs.   ∅-*ulung* 'UV-fall'
            Transitive: ***ng****alih* (<*N-alih*) 'AV-search'   ∅-*alih* 'UV-search'

Other morphological processes are also sensitive to the split. Morphological causativisation can only be applied to unaccusative roots in Balinese (and many other languages); hence *ulung-ang* 'fall-CAUS'"make fall or drop" is fine but *eling-ang 'cry-CAUS' "make cry" is not.

In languages that show semantically motivated intransitive split, the intransitive linking must specify the association with the verbal morphology that imposes the constraint on what argument type is possibly mapped onto the subject. In Balinese, for example, the actor voice (AV) prefix *N-* must have an entry shown in (63)a, saying that its left-most argument (i.e. the most prominent) is semantically an Actor (i.e. linked to [x] of AFFECT in the LCS):

(63). a. *N-* 'Actor Voice'   b. *eling* 'cry'   c. *ulung* 'fall'
                 SUBJ
                   |
       a-str: < − , ... >   < − >   < − >
                   | | |
       sem: AFF([x][...])   AFF([x],[ ])   AFF([ ],[x])
                 (actor)   (actor)   (undergoer)

Verbal unergative and unaccusative roots *eling* 'cry' and *ulung* 'fall' are listed in their entries without linking their sole core arguments to SUBJ, as shown in (63)b and(63)c. However the sole arguments are lexically linked to actor and undergoer respectively in LCS. Then, AV prefix *N-* is expected to be able to combine with *eling* yielding *ngeling* because both *N-* and *eling* specify the same actor linking. The combination of N- with the unaccusative root *ulung* 'fall', however, is not possible as there would be a clash between the actor linking of N- and the undergoer linking of *ulung*.

In English, the unergative/unaccusative distinction reveals itself in the resultative construction as seen in (64). The unaccusative verb *freeze* can appear with the resultative predicate (64)b but the unergative *run* cannot in (64)b.

(64). a. *The river froze solid.*

b. **She ran tired.*

c. *They hammered the metal flat.*

The acceptability of the resultative with the intransitive verb (64)a and with the transitive verb (64)c (where the resultative predicate is associated with object) suggests the S_O/O pattern (i.e. constrained by the underlying semantic role of the argument). The idea that the result predicate in resultative construction must be predicated to Object/theme (according to Simpson (1983)), known as DOR (Direct Object Restriction) comes from the contrast between (64)c and the sentence shown in (65):

(65). ** John hammered the metal tired.* (under the resultative reading)

Other languages such as Mandarin Chinese (Huang 2010) show more flexibility in resultative constructions, in that they allow the result to be predicated to an unergative subject (without fake reflexives as in the English translation) as in (66)a, or to a transitive subject (66)b. This can lead to ambiguity as in (66)c.

(66). a. *Lisi   tiao-lei   le*
       Lisi   dance-tired PERF
       'Lisi danced [himself] tired' (Huang 2010: 380)

b. *Zhangsan   chi-bao-le   fan   le.*
   Zhangsan   dance-tired-PERF rice   INC
   'Zhangsan ate rice (and became) full.' (Huang 2010: 380)

c. *Zhangsan   zhui-lei-le   Lisi.*
   Zhangsan   chase-tired-PERF   *Lisi*
   'Zangsan chased L and Lisi got tired.'
   'Zangsan chased L and Zangsan got tired.'
   'Zangsan caused Lisi to chase until he (Lisi) tired.' (Huang 2010: 386)

Structures of the type exemplified by Chinese raise questions regarding the universality DOR, and whether the differences of resultative constructions across languages can be explained in a principled way. They also pose a challenge to the linking analysis, especially when multiple readings are possible; see (Her 2004; Huang 2010) for discussions.

5.2   Voice alternations and symmetricality

Voice-related operations can be morpholexical, morphosyntactic and constructional, or a combination of these. We shall see that, while voice alternations are complex and vary across languages, an argument-structure-based account sheds light on the complex interplay between lexical semantics, syntax and information structure. In this subsection, we focus on common voice types in relation of (a)symmetricality in voice systems, namely (anti)passives (5.2.1) and non-demoting Austronesian-type undergoer voices (5.2.2).

5.2.1 Passive and antipassive in asymmetrical systems

Passives and antipassives are morphosyntactic processes that restructure a-strs. They are typically associated with asymmetrical accusative and ergative systems. Ergativity with antipassivisation poses a challenge to any syntactic theory because of the 'patient primacy' in the system where subject (or pivot) selection is by default associated with P rather than A. Default linking of P with subject is at odds with the commonly-adopted prominence-matching mapping principle because P is not a prominent argument. In the a-str based analysis of voice systems as adopted in this chapter. However, we recognise the significance of two basic systems, symmetrical and asymmetrical, and in relation to the latter the distinction of the default primacy of A in an accusative system vs. the default primacy of P in an ergative system.

There are two important properties for a voice system to be asymmetrical: default linking to subject and marking. One core argument (A or P) has the default primacy over the other in the system of linking to subject/pivot. The system is also asymmetrically marked, with the default one being typically morphologically unmarked. In an accusative system (67)a, it is the core A argument which has primacy over P, and S aligns with A in this case. In an ergative system (67)b, it is P which has the primacy over A, and S aligns with P. The asymmetric primacy alignment is represented by a dotted box in (67).

(67).   a. default (unmarked)   b. Default (unmarked)
                  accusative mapping   ergative mapping

syn: SUBJ   SUBJ
                   | |
a-str: < —— , (——) >   < (——), —— >
              (A/S)   (P)   (A)   (S/P)
LCS: ...   ...

An important corollary of the asymmetrical system is that a non-default or marked mapping results in an obligatory restructuring of arguments in the a-str list. That is, if P has to be mapped onto subject in the accusative system (67)a [4], P has to be the left-most argument in the a-str list. Since by the default A is the left-most argument, the only way for P to be the left-most argument is to remove A from the core argument list, either by suppressing it or demoting it to non-core. This is passivisation; exemplified by English:

(68).   a. *Tom painted the wall.*   *paint* < A , P >'   (default, active)
                                                      SUBJ OBJ
         b. *The wall was painted (by Tom).*   *painted* < P | (A) >   (marked, passive)
                                                      SUBJ OBL

The demotion outcome of A to non-core status is indicated by the position of A being on the right of the vertical bar in the a-str in (68)b. Passivisation ends up with P being the left-most argument and linked to SUBJ. Thus, obligatory removal of A from the core argument list is

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[4] The reason for the linking P to SUBJ can be pragmatic (e.g. topic continuity) or syntactic (e.g. clause-combining as in control structures).

the logical consequence of the asymmetrical system: A gives way to P to be the most prominent argument for the subject linking. The removal of A from the core argument list makes passivisation a detranstivisation process.

Antipassivisation in the ergative system is similarly a detransitivising process, where one core argument is removed or demoted. However, it is P which is removed from the core argument list, rather than A because the ergative system is asymmetrically oriented toward P, represented in (67)b. That is, P should give way to A when A is to be linked to subject as the linking to subject is asymmetrically done via P's position. This is the mirror image of passivisation; hence the term antipassivisation; exemplified in (69) from Dyirbal (Van Valin and LaPolla 1997):

(69). a.

ba-yi	*ḏaban-∅*	*ba-ŋgu-n*	*ḏugumbi-ṛu*	*buṛa-n*	SUBJ (Dyirbal)
DEIC-ABS	eel-ABS	DEIC-ERG-II	woman-ERG	see-TNS	< A , P >
'The woman saw the eel.'					'eel'

b.

ba-la-n	*ḏugumbil-∅*	*ba-gu-l*	*ḏaban-gu*	*buṛal-ŋa-ɲu-*	SUBJ OBL
DEIC-ABS-II	woman-ABS	DEIC-DAT-I	ell-DAT	see-ANTI-TNS	< A | P >
'The woman saw the eel.'					'eel'

As noted, the default linking in the transitive structure in Dyirbal is the one where the second argument (P) 'eel' is SUBJ (in ABS case) and the verb has no voice marking as in (69)a. The marked antipassive linking is shown in (69)b, where the P argument 'eel' is demoted to non-core status, represented as on the right side of the vertical bar, allowing A to be linked to SUBJ.

Interesting cases are expected to happen with ditransitive predicates because there are three core arguments (A, G, T) involved. On the a-str-based analysis where the core argument list is ranked thematically (cf. (47)c), the default a-str ranking of arguments is the one shown in active voice (70)a with G (beneficiary/recipient) being the second core mapped onto the first object. We then expect that G would more readily take priority over T in competing for the left-most argument position when A is removed from the core list. This is indeed the case, as seen by the acceptability of (70)b in contrast to (70)c. (The contrast also suggests that English shows an asymmetrical double object system).

(70). a. *John* (A) *bought Mary* (G) *a book* (T).   <A, G, T>

b. *Mary was bought a book* (*by John*).   <G,T | A>

c. ?**A book was bought Mary by John.*   *<T,G | A>

On our a-str based analysis, we also expect that an ergative system would 'dislike' truly ditransitive a-strs (i.e. with three core arguments, <A, G, T>) since there would be two P-like arguments. Since it is asymmetrically a P-oriented system, only one of them, either G or T, is treated as P-like, from which SUBJ can be linked. Then, one of them is typically forced to be demoted to oblique, giving rise to either <A, G | T> or <A, T | G> a-str. These two options are allowed in Central Artcic (Inuit) (Bok-Bennema 1991) with theme and goal obliques are marked differently:

(71). a. *Anguti-up   titiraut   nutarar-mut   tuni-vaa*   SUBJ OBL   (Inuit)
man-ERG   pencil   child-DAT   give-ind.3sg3sg   < A , T │G >
'The man gave a pencil to the child.'   'pencil' 'child'

b. *Anguti-up   titiraut-mik   nutarar   tuni-vaa*   SUBJ OBL
man-ERG   pencil-mod   child   give-ind.3sg3sg   < A , G │T >
'The man gave a pencil to the child.'   child' 'pencil'
(Bok-Bennema 1991:152)

Furthermore, suppose that the <A, G, T> a-str is allowed (i.e. where neither G nor T are oblique arguments), an ergative system would also have problems in antipassivisation if A is to be linked to SUBJ. That is, given the default linking of the lowest argument (i.e. right-most one) to subject in the ergative system and given the ranking arguments with G in between A and T, antipassivisation would remove the lowest argument (i.e. T) out of the a-str list. However, G rather than A would be the next argument in line for the linking to SUBJ. This difficulty of antipassiviation is reinforced by the fact that antipassives are not derivable from ditransitives in Halkomolem Salish (Gerdts 1988:155-156) 155).

The proposed a-str analysis herein predicts that the way to make A link to subject in an ergative system is to make both G and T oblique arguments. And this is indeed the case. Antipassivisation in Chamorro gives rise to double oblique constructions (72)a, and the antipassive counterparts of (71) above must also have both G and T in oblique status as shown in (72)b.

(72). a. *Man-offresi si Juan nu   hagu   ni   salape'.*   (Chamorro)
ANTIP-offer the Juan OBL EMPH.2SG OBL   money   < A │G , T >
'Juan offered the money to you.' (Cooreman 1987:122)   SUBJ OBL OBL

b. *Angut   titirauti-mik   nutarar-mut   tuni-si-vaa*   (Inuit)
man   pencil-mod   child-DAT   give-ANTI-ind.3sg   < A │G T >
'The man gave a pencil to the child.' (Bok-Bennema 1991:153)   SUBJ OBL OBL

Likewise, in the accusative system like English, this proposed a-str analysis would also predict the problem of the passivisation of <A, G, T> where T is the passive subject. This is because when A is removed from the left-most argument, G would be the argument selected as the subject. One solution is to make G an oblique as well; hence the contrast between *The book was given to John by Mary* vs. *The book was given John by Mary*. When G is made the subject, T must not be demoted to oblique; hence the unacceptability of * *John was given with the book by Mary*.

5.2.2 Symmetrical voice systems

A voice system is symmetrical if it shows the following two important properties. Firstly, all voice types are equally morphologically marked on the verb. Secondly, the transitive A and P core arguments are equally possibly linked to grammatical subject without demoting the other to oblique status. A language with a symmetrical voice system therefore exhibits more than one type of transitive structure where one type cannot be claimed to be

morphologically derived from the other. In addition, a voice alternation in this type of system does not always involve restructuring the a-str. Rather, it involves different linkings from the same argument structure. Since there is no demotion, the main arguments involved in voice alternations behave more or less equally like core arguments.

Many Austronesian languages of the Indonesian-type or Philipinne-type are known to have symmetrical voice systems. Consider the following examples from Tukang Besi, an Austronesian language of south-east Sulawesi Indonesia (Donohue 2002):

(73). (Tukang Besi)

a. *no-kiki'i   te   iko'o   na   beka*   SUBJ CR
   3REAL-bite   CR   you   NOM   cat   < 'cat', 'you'>
   'The cat bit you'   (A)   (P)

a. *no-kiki'i=ko   (na   iko'o)   te   beka*   CR   SUBJ
   3REAL-bite=2s NOM   you   CR   cat   < 'cat' , 'you'>
   'The cat bit you' (Lit. You, the cat bit')   (A)   (P)

Both (73)a and (73)b share the same a-str with the 'cat' being A and 'you' being P. The two sentences differ in the linking of the arguments to SUBJ(ECT) and CORE (CR) functions. Sentence (73)a is equivalent to the active voice in English. Sentence (73)b showing the selection of P ('you') as subject in (73)a is not exactly equivalent to the passive as in English because the A argument ('cat') in this structure remains core, marked by the core (CR) phrasal marker *te*. In short, a core argument (A or P) can be selected as subject, and the alternation does not restructure the a-str because in either case the core argument is not demoted to oblique status.

The examples in (74) illustrate voice symmetricality in Tagalog (Foley and Van Valin 1984:135; Kroeger 1993:13-14):

(74). a. *B-um-ili   ang=lalake   ng=isda   sa=tindahan.*
         PERF.AV-buy   NOM=man   GEN=fish   DAT=store
         'The man bought fish at the store.'

     b. *B-in-ili-Ø   ng=lalake   ang=isda   sa=tindahan.*
         PERF-buy-OV   GEN=man   NOM=fish   DAT=store
         'The man bought the fish at the store.'

     c. *B-in-ilh-an   ng=lalake   ng=isda   ang=tindahan.*
         PERF-buy-DV GEN=man   GEN=fish   NOM=store
         'The man bought fish at the store.

As seen, from the root *bili* 'buy', we can derive the actor voice *bumili* (Agent=subject) and other specific non-actor voices such as Objective voice *binili* (Theme=subject), and Dative/Locative voice *binilihan* (locative=subject). (Other voice types are possible but not exemplified here.) Tagalog arguments receive phrasal markers: Subject is marked by *ang* whereas core arguments by *ng*. When agent and theme are not selected as subject as in (74)c, they maintain their core status, both receive *ng*.

We have observed the non-restructuring effect of voice alternation on mono-transitive a-str containing main core arguments, <A, P>. However, when a non-A and non-P argument

(e.g. locative or instrument) is involved, the voice alternation does appear to affect the a-str. (This is similar to applicativisation, a point further discussed in subsection 5.5 below). For example, the selection of a goal/locative argument as subject in (74)c above results in a ditransitive structure (i.e. three core arguments including the locative subject).

Austronesian languages of the Philippine-type, like Tagalog, show highly symmetrical systems and have no passive. Other Austronesian languages, while showing voice symmetry, do have a passive. Indonesian therefore provides good evidence for the significance of core-oblique distinction in the a-str as it exhibits voice alternations with and without restructuring of a-str. Consider the reflexive in actor voice (AV), undergoer voice (UV) and passive voice (PASS) sentences in (75):

(75). a. *Dia   tidak   mem-perhatikan   dirinya*   SUBJ
        3s   NEG   AV-care   self.3   'care< '3s'$_i$, 'self.3'$_i$ >
        'He didn't take care of himself.'   A   P

     b. *Dirinya   tidak   di-perhatikan=nya*   SUBJ
        'self.3   NEG   UV-care=3s   'care< '3s'$_i$, 'self.3'$_i$ >
        'He didn't take care of himself.'   (A)   (P)

     b. * *Dirinya   tidak   di-perhatikan   oleh=nya.*   SUBJ
         self.3   NEG   PASS-care=3   by=3   'care< 'self.3'$_i$ ><'3s'$_i$>
                                                                     P   A

Recall that the prefix *di-* in Indonesian can be associated with the UV and PASS depending on the construction it is part of (cf. section 3.4). The point here is that the AV-UV alternation share the same a-str with A outranking the P reflexive *dirinya*. The AV-UV alternation does not affect the ability of A to bind a reflexive. This is confirmed in (75)b, where the reflective subject is bound by a non-subject core *=nya*. In contrast, the passive agent loses this ability because it is demoted to oblique, as seen in (75)c.

5.3 Middles and anticausatives

Middles and anticausatives are like passives in that they result in detransitivisation: the underlying agent/causer isn't included as the most prominent argument in the a-str list, and therefore isn't projected onto the syntax as subject. The a-strs of middles, passives and anticausatives in English are given in (76).

(76). a. *Tom painted the walls.*   (active: transitive)   <A, P>

     b. *The walls were painted (by Tom)*   (passive: intransitive)   <P | (A)>

     c. *These kinds of walls paint easily*   (middle: intransitive)   <P>

     d. *The jar broke.*   (anticausative: intransitive) <P>

For simplicity, we discuss middles in contrast to passives first, then in contrast to anticausatives.

Middles and anticausatives differ from passives in the following important respects. As pointed earlier, the agent of passives is linked to the a-str but it's demoted to an oblique. Its presence is optional, indicated by placing it in brackets in the a-str of (76)b. When it is not overtly present, it is an implicit argument. It is still syntactically somehow present to a

certain extent as is evident from its ability as an anaphoric controller of the null subject of the purposive clause (Sadler and Spencer 1998).

(77). a. *These walls were painted to protect them against the rain.*

b. * *These kinds of walls paint easily to protect them against the rain.*

The agent of middles is not linked to the syntactic a-str. It is not an implicit syntactic argument, and has no possible projection to syntax:

(78). * *These kinds of walls paint easily by professional painters.*

However, it is argued that middles involve an implicit causer/agent role, even though they are not a syntactic arguments (Iwata 1999). Given the right context, a specific agent is implied; typically generic, but most likely the speaker, or somebody else, as in the following example:

(79). *According to what the driver told me, this case handled smoothly while I was sleeping in the backseat* (Iwata 1999).

Middle morphology, if any, is often polysemous in many languages. The same middle affix gives rise to different functions (resultative-stative, reflexive, reciprocal etc.) (Kemmer 1993). Different functions typically depend on the semantics of the roots; see examples from Fula in (81) below. This fact provides support that middles are morpholexical.

While middles and anticausatives share the property that the agent/causer is obligatorily not projected onto the syntax, they differ in that anticausatives may have implied causative meaning, or the inchoative part of the causation. In English, anticausatives such as *break* are distinguished from middles in that they can appear without adverbials such as *easily*:

(80). a. *The glass broke (easily).*   (anticausative)

b. *These kinds of walls paint easily.*   (middle)

c. * *These kinds of walls paint.*

In English, there is no morphology for middles and anticausatives. The distinction between the two is established on the basis of constructional constraints as illustrated in (80) above. The meaning involved is also slightly different, even though the a-str is arguably the same (at least in English). The anticausative such as *break* and *close* carry a causative meaning but the situation may be understood as self-instigated, i.e. the sole argument is possibly understood as 'self-causer/instigator'. The middle structure as in (80)b cannot be understood as self-instigated. The implied agent ('the painter') is referentially different from the subject ('the paintee: wall'). The properties of the argument surely also play a role (Rappaport Hovav and Levin 2011). The distinction between middles and anticausatives in English appear to be tenuous, and the two might belong to a broader single category (Kibort 2004:203-4).

Indeed, in other languages such as Fula (Kaufman 2006) the same middle morphology (-*ake*) is used to encode anticausative meaning, in addition to other middle meanings such as reflexive.

(81). a. *yolnde   ma66-ake*   (anticausative reading)   (Fula)
      door   close-PERF.MID
      'The door closed.'

   b. *o   loot-ake*   (reflexive reading)
      3SG   wash-PERF.MID
      'S/he washed.'

   c. *mi   wu'y-ake   deptere*   (reflexive reading)
      I   lend-PERF.MID   book
      'I borrowed a book.'

5.4 Verbal reflexives and reciprocals

Reflexives and reciprocals are expressed in different ways across languages. We use the term verbal reflexives/reciprocals (or simply reflexives/reciprocals) for cases where such meanings are expressed without syntactic reflexive/reciprocal arguments. The structures like English *I saw myself* or *We hate each-other*, where such meanings are expressed by means of anaphoric relations, referred to as syntactic binding, are excluded from the discussion here.

Reflexives/reciprocals are detransitivisation processes which may or may not have dedicated morphology. If not, it is often the case that they are part of middle formation. Verbs with inherent reflexive meaning (e.g., 'wash') or inherent reciprocal meaning (e.g. 'meet') often appear in middle morphology as seen in (81)b from Fula.

In English, verbal reflexives and reciprocals have no dedicated morphology. They are expressed by intransitive verbs whose forms are the same as their transitive counterparts; e.g. *wash* as in *John washes (himself)* and *meet* as in *They meet (each other)*. Surely, for the inherently reciprocal verb like *meet*, if used intransitively, the subject must be plural; hence **I met*.

In Romance languages reflexive verbs are typically formed by reflexive clitics. The reflexive cliticisation is a valence-reducing process. For example, the clitic *se* in French gives rise to a predicate that does not allow the presence of object NP corresponding to the clitic (82). There is evidence that the reflexive structure is intransitive, and it is more like unergative rather than unaccusative (Reinhart and Siloni 2005).

(82). *Jean   se   voit   dans   le   miroir*   (*l'homme).   (French)
       Jean   REFL   sees   in   the   mirror   (the.man).
       Jean sees himself in the mirror.

In Yukulta (an Australian language) (83) (Keen 1983), the reflexive/reciprocal has a distinct intransitive clitic. The reciprocal must take an intransitive clitic complex subject, *=li=ngka* as in (83)b. In contrast, the subject of a transitive verb (without reflexive/reciprocal meaning) takes the transitive clitic complex, e.g. *=l=ka=nta* for '3PL=TR=PST' as in (83)a.

(83). a. *Pala-tha=l=ka=nta*   *ngawu-wa*   *thungal-urlu-ya.*   (Yukulta)
      hit-INDIC=3PL=TR=PAST   dog-NOM   stick-COMIT-ERG
      'They hit the dog with a stick.'

    b. *Purlti‑nytyu-tha=li=ngka*   *wangalk-urlu,*
      pelt-RECIP-INDIC=3PL.INTR=PAST   boomerang-COMIT
      'They pelted one another with boomerangs'

Facts just presented show that verbal reflexives and reciprocals affect the a-strs of the predicates, giving rise to syntactically intransitive argument-structures. They are morphosyntactic processes in Sadler and Spencer's (1998) term. However, questions remain on the nature of reflexivisation (e.g., whether it is purely in LCS (lexical) or it can also be possibly in syntactic a-str) and of the syntactic accessibility of the reflexive/reciprocal 'role' (i.e. whether it is possibly realised, and if yes in what function).

Reflexives in ECM constructions of the type shown in (84) pose a problem to the analysis that reflexivisation is purely at the level of LCS of the predicate. This is because the clitic is attached to the main verb *considère* 'consider'. Note that the reflexive role is not the semantic role of the matrix verb but is that of the embedded predicate *intelligent.* One way of accounting for this using an a-str-based analysis is to have structure-sharing at the a-str level as shown in (85). The second argument 'self' in the a-str has no corresponding thematic role in the LCS but is structure-shared with (i.e. identified with) the argument of the embedded predicate *intelligent.* I will not discuss this any further.

(84). a. *Jean considère Pierre intelligent.* (French)
      Jean considers Pierre intelligent

    b. *Jean se conside`re intelligent.*
      Jean SE considers intelligent
      'Jean considers himself intelligent.'

(85).
                           'Jean' 'self'

     a-str: 'consider' < —— , —— , 'intelligent < —— >'>'

     LCS: (considerer) (considered)

5.5 Causatives and applicatives

Both morphological causativisation and applicativisaton are valence-augmenting processes. They are therefore a transitivising operation. (However, there are cases where applicativisation does not augment the transitivity of the base predicate; e.g. in Bima (100) below). They are of particular interest in linguistic theory because their properties both raise questions about and provide evidence for certain theoretical conceptions, especially in relation to the issue of lexicalism and the conception of argument structure within the on-going debate on the separation of lexicon and syntax. For simplicity, I only address the common issues in relation to their argument-structures.

One issue to be addressed by any theory is how to account for the cross-linguistic facts that they are both transitivisers and that they differ in terms of the effects in argument alternations. Causativisation results in the addition of an agent whereas applicativisation results in the addition, or promotion of, a non-agent. In many languages, they may be encoded by the same morphology (Austin 2005 [1996]; Arka et al. 2009); see example (91) below.

One way of accounting for similar properties of causatives and applicatives is to analyse them as three-place predicates. Causativisation and applicativisation involve predicate composition and argument fusion (Butt 1995; Alsina 1996). They differ in the nature of fusion. Consider their similar argument structures:

(86). a. Causative: 'AFFECT < ⸺ , ⸺ , 'pred < ⸺ ... >'>'

                    (A)   (P)

    b. Applicative: 'AFFECT< ⸺ , ⸺ , 'pred < ⸺ | (⸺) >'>'

                    (A)   (P)

The a-str of the causative (86)a says that the causee P fuses with an argument of the embedded argument. This is to capture the meaning that the causee is to do something or undergo a change as the effect of the causation. (That is, the fused embedded argument could be agent-like or patient-like, a source for variation across languages; see the discussion in (Alsina and Joshi 1991; Alsina 1992)). The argument fusion also captures the observation that the A (agent) argument is newly introduced by the causative. Consider the causativisation in (87) from Dyari (an aboriginal language of Australia):

(87). a. *Pirta   tharka-yi.*   (non-causative)
      stick   stand-pres
      'The stick is standing.'

    b. *Karna-li   pirta   tharka-ipa-yi.*   (causative)
      man-erg   stick   stand-CAUS-pres
      'The man stands the stick up.'   (Diyari; (Austin 2005 [1996]))

The a-str of the (non-causative) intransitive predicate 'stand' is given in (88)a whereas its causative counterpart is given in (88)b:

(88). a. *tharka-*   'stand < 'stick' >'

    b. *tharka-ipa-*: 'AFFECT < 'man' , ⸺ , 'stand < 'stick' >'>'
                            (A)   (P)
                            ERG

The causer (A) 'man' outranks the causee (P), which is identified as the base's argument ('stick'). The causer is realised as the ERG argument in this ergative language because it is the A argument. In a language with an accusative system, it would be the nominative subject.

The a-str of the applicative (86)b says that the actor fuses with the embedded actor, and the affected argument (P) fuses with an embedded non-agent argument. Importantly,

this non-agent argument is syntactically non-core, indicated by placing it on the right of the vertical bar. The brackets mean that the applied argument might not be an argument of the embedded predicate. The argument fusion captures the fact that P is newly introduced and promoted to core argument status in the applicativisation. This is illustrated by examples (89) from Madurese (Davies 2005) whose a-strs are shown in (90):

(89). a. *Atin   entar   dha'   Jakarta.*   *(Madurese)*
      Atin   go   to   Jakarta
      'Atin went to Jakarta.'

    b. *Atin   ng-entar-e   Jakarta.*
      Atin   AV-go-APPL   Jakarta
      'Atin went to Jakarta.'   (Davies 2005)

(90). a. *entar*   'go< 'atin' | 'Jakarta'>   (intransitive)

    b. *ng-entar-e*   SUB OBJ
                   | |
        'AFFECT< —— , —— , 'go < 'atin' | 'Jakarta' >'>' (transitive)

                  (A)   (P)   (goal)

The argument fusion shown in (90)b captures the promotion of the goal argument, *Jakarta*. The goal *Jakarta* is a non-actor, and is non-core of the intransitive base predicate *entar* 'go'. In the independent clause, the goal is expressed as a PP. In the embedded applicative a-str structure, the goal is fused with P, which is then linked to OBJ because the matrix verb is the actor voice where the fused A argument (*Atin*) is linked to SUBJ.

    The analysis of causativisation and applicativisation as having similar a-strs but have different argument fusion accounts for the fact that in certain languages they are encoded by the same morphology. Consider Balinese *-ang*, as applicative in (91)a but as causative in (91)b. Note that the causative reading is not possible in (91)a. Likewise, the applicative reading is not possible in (91)b.

(91). a. *Nyoman   ng-ayah-ang   Ketut*   (applicative)
      Nyoman   AV-do.service-APPL   Ketut
      i) 'Nyoman did the social service for Ketut.'
      ii) * 'Nyoman made Ketut do the social service.'

    b. *Nyoman   ng-ulung-ang   adin-ne*   (causative)
      Nyoman   AV-fall-CAUS   younger.sibling-3POSS
      i) 'Nyoman dropped his younger sibling (i.e. made his younger sibling fall over)'
      ii) * 'Nyoman deliberately make himself fall off for his younger sibling.'

    The question of whether *–ang* functions as a causative or applicative suffix is predictable. The a-strs and argument fusion shown in (86) capture the semantic tendency which imposes a constraint that the fused arguments must be thematically similar. (There may be variation across languages on how strict this constraint is, which might interact with argument marking; further discussed below). In Balinese, the constraint is strictly imposed. For example, when the intransitive root is patientive, e.g. *ulung* 'fall' (91)b, its sole core

argument (P) fuses with the matrix P, not A, resulting in a causative verb (92)a, not an applicative verb (92)b:

(92). a. Causative *ng-ulung-ang*   b. *   Applicative *ng-ulung-ang*

                SUBJ OBJ   SUBJ OBJ

     'AFFECT <——,——, 'fall <——... >'>'   'AFFECT <——,——, 'fall <——>'>'

           (A) (P)   (P)   (A) (P)   (P)

Another challenge in the a-str based analysis of causativisation and applicativisation is how to account for variations in argument marking of the non Actor argument, i.e. the causee or the applied arguments. Complications arise when the base predicate is transitive.

Cross-linguistic evidence suggests that there are related conceptual semantic properties that matter in relation to argument marking. These include manner of affectedness (direct vs. indirect manipulation) and the extent of control that the fused participant has with respect to the realisation of the event depicted by the base predicate. In Japanese, for example, the causee object can be accusatively or datively marked. The difference renders different interpretations (Song 2001):

(93). a. *Kanako   ga   Ziroo   o   ik-ase-ta*   (Japanese)
      Kanako   NOM   Ziroo   ACC   go-CAUS-PST
      'Kanako made Ziroo go.'

    b. *Kanako   ga   Ziroo   ni   ik-ase-ta*
      Kanako   NOM   Ziroo DAT go-CAUS-PST
      'Kanako got Ziroo to go.' (Song 2001:283)

The accusative object (93)a is associated with a highly patientive meaning of the causee; the caused event of 'going' was realised without Ziroo's volition. In contrast, a datively marked object causee in (93)b depicts a situation where Ziroo exercised control of 'going' and the causer Kanako appealed to Ziroo's volition to enact this.

The difference in control/volition of the sentences in (93) can be represented follows:

(94). a.   OBJ:ACC   b.   OBJ:DAT

           'ziroo'   'ziroo'

    'AFF<——,——, 'go <——>'>'   'AFF<——,——, 'go <——>'>'

      (A) (P)   (theme)   (A) (P)   (agent)

Ziroo in (93)a is simply a theme, represented in (94)a, but Ziroo in (93)b is agent-like, represented in (94)b.

When the base is transitive, the fusion of the matrix P with embedded A or P gives rise to object vs. oblique alternations, accompanied by expected difference in meaning on the nature of causation. Consider sentence (95)a where the causee 'general' is marked with dative case and (95)b where it is expressed optionally as an oblique (Alsina 1996). Their a-strs are shown in (95)a and (95)b respectively.

(95). a. *He fet netejar els lavabos al general.* (French)
I have made clean the toilets to the general
'I made the general clean the toilet.'

b. *He fet netejar els lavabos pel general.*
I have made clean the toilets by the general
'I made the toilet cleaned by the general.'   (Alsina 1996:195)

(96). a.   DAT.OBJ   OBL
             'general'   'toilet'   b.   'toilet'   'general'
    'AFF< —, —— , 'clean < —— , ——>'>'   'AFF< —, —— , 'clean < ——, —— >'>'
             (A) (P)   (A) (P)   (A) (P)   (A) (P)

The a-strs in (96) show different argument fusions, capturing the difference in meaning of the two sentences: in (95)a/(96)a, 'the general is affected: I did something to the general' (Hyman and Zimmer) whereas in (95)b/(96)b 'the toilet is affected; it happened to be the general that I got to do it'.

An agentive causee can also be expressed by the instrumental case, as seen in Hungarian (Cole 1983) (97). In (97)a, the causee is agentive, e.g. the coughing is controllable, for example, at the request of the causer. In (97)b, however, coughing is uncontrollable by the causee.

(97). a. *Köhögtettem a gyerek-kel*   INST   (Hungarian)
       I.CAUS.cough the boy-INST   'AFF < —, —— , 'cough < ——>>'
       'I had the boy cough.'   (A)

b. *Köhögtettem a gyerek-et*   ACC
   I.CAUS.cough the boy-ACC   'AFF < —, —— , 'cough < ——>>'
   'I made the boy cough.'   (P)

To conclude, an a-str based analysis for causativisation and applicativisation outlined above can nicely capture argument alternations and their related semantic properties.

We have been assuming a lexically based analysis where morphologically derived causatives and applicatives are complex predicates created in the lexicon, separate from syntax. Words are lexical units, and syntactic modification could not penetrate into units inside words, as this violates 'lexical' integrity of the words. However, in certain languages external adverbial modification could indeed get access to a unit inside words. In the following example from Bemba (Givon 1976), for example, 'quickly' modifies the verb root 'run'.

(98).   *Naa-butwiish-ya   Mwape   ulubilo*
       1SG.PAST-run-CAUS   Mwape   fast
       a. 'I made Mwape *run quickly*.'
       b. * 'I *quickly made* Mwape run.'   (Givón 1976:343)

In a lexicalist theory like LFG where syntactic modification is regulated by a separate structure called functional structure, external syntactic modification into sub-lexical unit is not a problem. One way of doing this is to analyse the embedded predicate residing inside

the derived verb as being mapped onto the syntactic function with control called XCOMP, and the adverbial *ulubilo* 'fast' as an adjunct within this function even though it is outside the verb. The mechanism of projection of morphology to syntax in LFG would render the a-str with its mapping in (99)a and the f-str shown in (99)b, with the meaning of (98)a as intended.

(99). a.   (SUBJ)(OBJ)(XCOMP)   (XCOMP ADJUNCT)
        'AFF< —, — 'run < — >'   'quickly'

b.

$$
\begin{bmatrix}
\text{SUBJ} & \text{'I'} \\
\text{PRED} & \text{'AFF<SUBJ, OBJ, XCOMP>'} \\
\text{OBJ} & \text{'Mwape'} \\
\text{XCOMP} & \begin{bmatrix} \text{SUBJ} & \\ \text{PRED} & \text{'run<SUBJ>'} \\ \text{ADJUNCT} & \text{'quickly'} \end{bmatrix}
\end{bmatrix}
$$

Finally, it should be noted that applicativisation does not always result in the promotion of an argument to core status. This is the case when semantic and pragmatic pressures do not align to a single argument. For example, the applicativisation of the verb *ndawi* 'make' in Bima results in the applied argument *nahu* being the first object coming immediately after the verb as in (100)a. If passivised, this applied argument becomes subject. This is expected as the applied argument becomes more prominent in the a-str than the base's theme argument 'cage'.

(100). a. *Sia   ndawi-wea-na   nahu   kuru   nasi*   (AV)
            3SG   make-APPL-3.REAL   1SG   cage   bird   (Bima)
            '(S)he has made a bird cage for me'

        b. *Nahu   ndawi-wea   ba   sia   kuru   nasi*   (PASS)
            1SG   make-APPL   by   3SG   cage   bird
            'I was made the bird cage by him/her'

However, Bima also allows a passive of the applivative verb with the P *kuru* 'cage' argument being subject:

        c. *Kuru   nasi   ede   ndawi-wea   ba   sia   ruu   nahu*   (PASS)
            cage   bird   that   make-APPL   by   3SG   for   1SG
            'The bird cage was made by him/her for me'

The important point to note in (100)c is that the applied argument must be an oblique, marked by *ruu*. Otherwise, the structure is not acceptable:

        d. * *Kuru   nasi   ede   ndawi-wea   nahu   ba   sia*   (PASS)
            cage   bird   that   make-APPL   1SG   by   3SG
            'The bird cage was made by him/her for me'

In short, we have an applicative verb ndaiwea as in (100)c where the applied argument is not promoted to object; in fact it must be an oblique.

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The evidence from Bima shows an interaction of the so-called AOP (Asymmetric Object Principle (Bresnan and Moshi 1990; Alsina and Mchombo 1993; Bresnan 2001), which says that only one object can be made (passive) SUBJ. On our a-str analysis, the ditransitive has the structure of <A, G, T> where G is the second in order of promincence and wins in the competition for the linking to SUBJ. Bima appears to adhere to the AOP; hence in an active-voice applicative ditranstive sentence as in (100)a, the G is *nahu*, which is selected as SUBJ in passive.

Making T (*kuru* 'cage') subject in the applicativised verb means that T must be in second position. G should give way to T for this. The only way out is for G to be oblique (i.e. non-core). This is so, because, if it were still core, it would be more prominent than T, blocking the mapping of T to subject, which is not acceptable, as shown by (100)d. Facts from Bima provide further evidence for argument ranking in the a-str where core arguments outrank non-core arguments.

5.6   Noun incorporation

Noun incorporation (NI) is another morphological process that affects argument realisations. Examples showing pairs of structures with and without NI are given below from Mapudungun (Baker 2009) and Chukchi (Spencer 1995). The (a) sentences have their objects appearing as independent NPs in syntax whereas the (b) shows the near-paraphrase counterparts with the nouns and the verbs appearing as single compound words.

(101).a. *Ñi*   *chao*   *kintu-le-y*   *ta-chi*   *pu*   *waka*   (Mapudungun)
     my   father   seek-PROG-IND.3sS   the-ADJ   COLL   cow
     'My father is looking for the cows.'

    b. *Ñi*   *chao*   *kintu-waka--le-y*
     my   father   seek-cow-PROG-IND.3sS
     'My father is looking for the cows.' (Baker 2009, ex. (1))

(102).a. *ənan*   *qaa-t*   *qərir-ninet*   (Chukchi)
     he.ERG   deer-ABS.PL   seek-3sG.s/3PL.o
     'He looked for the reindeer.'

    b. *ətlon*   *qaa-rer-gʔe*
     he.ABS   deer=seek-3sG.s   (Spencer 1995: ex (8))

The existence of pairs of the type shown in (101)-(102) has sparked debates in linguistics regarding whether the (b) sentences showing NI is a lexical or syntactic process. Proponents of a syntactic approach within the Chomskyan frameworks (GB to MP) (Baker 1988, 1996) argue the (b) sentences with NI are syntactically derived from the same source as (a) sentences via movement or merge. In contrast, lexicalists (Mithun 1984; Di Sciullo and Williams 1987; Rosen 1989; Spencer 1995) have held the analysis that the verbs in the (b) sentences are the outcomes of compounding taking place in the lexicon. For an overview of the debates and key references on NI, see Masam (2009). Due to the limitation of space, I will only address certain a-strs related issues of NI.

First, what is the a-str of the NI? Or, to put it differently, is the incorporated noun a syntactic object, of the same status as its non-incorporated one? In a syntactic analysis of NI of the type adopted by Baker, the incorporated N is a syntactic object originally in the object position, ending up incorporated into the head verb via movement. The problem with this analysis is that the transitivity of the verb should not be affected by incorporation. This is not (always) true; e.g. as seen in (102)b (and also many other languages with NI), the clause with NI is syntactically intransitive: the actor is marked in the same way as the intransitive subject.

From a lexicalist perspective, NI is a lexical process. The fact that NI affects syntactic transitivity indicates that the sentences with and without NI do not have the same a-str and that the noun (while sharing the semantic role of 'patient') does not have the same syntactic status. Precisely, in the non-incorporated structure, the patient is a syntactic core argument mapped onto syntactic object whose semantic content (*qaa* 'deer' in (102)a) is supplied in the syntax. This can be represented in (103)a.

(103).   a. Non Incorporation   b. Noun Incorporation
                   ERG   ABS   ABS
                    | | |
a-str: 'seek < ――, ―― >'   'seek < ―― >'
                    | | |
LCS: AFF ([X] [Y])   AFF ([X] [DEER])
             (actor)(patient)   (actor)(patient)

However, in the incorporated structure of (102)b (represented in (103)b), the compounding process with the noun *qaa* 'deer' results in a verbal predicate where the semantic content *qaa* 'deer' fills in the understood thematic patient and functions as a semantic constant of the predicate. In effect, there is no second syntactic core argument in the a-str, rendering the structure intransitive. The sole argument understood as the actor is then assigned ABS as is the case with other intransitives in this language.

There are different types of NI; see Mithun (1984) and Rosen (1989). Unlike, the NI exemplified above, the ones exemplified below called the classifier NI do not affect the a-str of the verb, as the NI can appear with an object:

(104).   *Wa'-k-ather-a-hninu-'*   *thikv*   (Mohawk)
          FACT-1sS-basket-∅-buy-PUNC that
          'I bought that basket.'   (Baker, Aranovich, and Golluscio 2005: ex. (6))

The example of the type in (104) has been taken as evidence for the idea that NI is syntactic. The N 'basket' originates in the object NP, incorporated to the verb leaving its material stranded in the object position. However, there is a problem with this syntactic analysis because object doubling is possible with NI:

(105).   *Wa'-k-ather-a-hninu-'*   *thikv   ather-e'*   (Mohawk)
          FACT-1sS-basket-∅-buy-PUNC that   basket-NSF
          'I bought that basket.'   (Baker, Aranovich, and Golluscio 2005: ex. (21))

Likewise, the verb 'skin-remove' in the example shown in (106) below can be taken as possessor stranding (reading (i)), providing evidence for a syntactic analysis of NI. That is,

the noun 'skin' was originally part of the object NP, but left its possessor after incorporation. However, the object 'seal' is in fact more accurately interpreted as the source rather than the possessor as shown by reading (ii)(Van Geenhoven 1998). In this case, then, no syntactic movement is necessary in the analysis.

(106). *Nuka-p   puisi   ami-ir-pa-a-a*   (West Greenlandic)
      Nuka-ERG   seal.ABS skin-remove-IND-[+TR]-3sS/3sO
      i)   'Nuka removed the seal's skin.'
      ii)   'Nuka removed the skin from the seal.'   (Van Geenhoven 1998)

The verb *wa'-k-ather-a-hninu* 'basket-buy' in (105) and *ami-ir-pa-a-a* 'skin-remove' (106) can be alternatively analysed from a lexicalist perspective as complex N-V verbs which are transitive, like their verb roots. The incorporated noun within the verb is a semantic constant in the LCS of the verb, and is not a syntactic argument. Hence, the structure of classifier NI type can appear with a syntactic object.

While the incorporated noun is typically a constant or understood as generic within the LCS of the derived verb, there is evidence that this is not always the case. It is reported that the incorporated noun in Greenlandic and also in Mapudungun (example (107)) can be the antecedent of a subsequent pronoun; that is, it acts referentially like an indefinite noun and also shows a characteristic kind of interaction with negation and other sentential operators (Van Geenhoven 1998).

(107). *Ngilla –waka-n.   Fey   langüm-fi-ñ*   (Mapudungun)
      buy-cow-IND.1sS   then   kill-3O-IND-1S
      'I bought a cow. Then I killed it.'   (Baker 2009: ex. (16))

In fact, an incorporated noun in Mapudungun can be definite, just like a definite NP in English, as seen in example (108) below.

(108). *Juan   ngilla-pullku-la-y.   Iñche   ngilla-fi-ñ*
      Juan   buy-wine-NEG-IND.3sS   1   buy-3O-IND.1S
      'Juan didn't buy the wine. I bought it.'   (Baker 2009: ex.(18))

Baker (2009) provides further evidence from Mapudungun showing that an incorporated noun can have the same anaphoric properties like an unincorporated one. It is subject to Condition C of Chomsky's binding theory. Consider the following contrast:

(109).a.# *Ti ullacha domo   pe-fi-y   ti ayü-domo-le-chi   wentru*
      the young   woman see-3O-IND3sS the love-woman-STAT-ADJ man
      'The young woman saw the man who woman-loved (that woman).'

   b. *Ti ullcha domo   ñi   chaw pe-fi-y   ti ayü-domo-le-chi   wentru*
      the young woman 3.POSS father see-3O-IND3sS the love-woman-STAT-ADJ man
      'The young woman's father saw the man who woman-loved (that woman).'

In (109)a, the incorporated noun 'woman' embedded inside a noun phrase cannot be coreferential with the subject of the sentence that the noun phrase is contained in. In (109)b, the same incorporated noun can co-refer to the possessor of the subject. That is, the incorporated noun cannot be co-referential with an NP that c-commands it.

Given the variations of the behaviour of NI across languages, we may have to conclude that there is no single unified syntax for all the constructions called NI across languages. In some languages where incorporation results in detransitivisation as in (102) above, the incorporated noun is not a syntactic object. In other languages such as in Mapudungun, the incorporated noun does indeed behave like a syntactic object. The latter case provides support for Baker's (or the Minimalist) syntactic analysis that NI leaves a trace or copy behind. It therefore has the same referential properties for purposes of semantic interpretation and discourse anaphora. However, the same properties are equally accounted for in other frameworks such as LFG where no movement or structural merge is assumed. In this analysis, an incorporated noun inside verb complex can bear the grammatical function of OBJ whose complete values including definiteness can be supplied from different structural units, within or outside the verbal complex.

6 Summary

This chapter has discussed different types of argument structure alternations in many languages: voice alternations in asymmetrical and symmetrical systems (passives/antipassives, actor/non-actor voices), applicatives, middles, (anti)causatives, reciprocals/reflexives and noun incorporation. While commonly morphologically marked, the alternations in certain languages may involve no verbal morphology at all; e.g. passives without passive morphology in Manggarai and Rongga, or (anti)causatives without (anti)causative morphology in English. A-str alternations without morphology pose a theoretical challenge leading to competing analyses and controversy (e.g. the question of whether they involve derivation, and if yes, the direction in the derivation).

Different conceptions of argument structures across theories are explored in this chapter. It is hard to do justice to all of the contemporary theories. They have been discussed in terms of projectionist and constructivist approach to syntax. However, in the projectionist approach, syntax is lexically driven by the a-str information stored in the lexicon. In the radical constructivist approach there is no lexical a-str. In this chapter, we have adopted the middle-ground approach, maintaining the lexical a-str but at the same time also recognising the importance of construction in determining the ultimate a-str of a predicate. We have seen how a lexical a-str is altered by morphological and/or constructional processes. Morphology may partially specify the a-str linking and the ultimate alternation is determined by a specific construction where the predicate is part of. There is also evidence that the properties of the arguments contribute to the possibility of a-str alternations. The version of the a-str adopted in the chapter accounts for alternative argument realisations in both symmetrical and asymmetrical systems, including the expected problems in (anti)passivisation associated with ditransitive predicates.

7 References

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