Voice and Being Core:
Evidence from (Eastern) Indonesian Languages *

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1 Introduction

The paper deals with the significance of core argument status and associated (pragmatic) prominence in (eastern) Indonesian languages of the Nusa Tenggara region covering the provinces of Bali, West Nusa Tenggara, and East Nusa Tenggara. There are tens of languages in this area but the present analysis is mainly based on Balinese[1], Bima[2], Manggarai, Lio, Sikka[3], and Lamaholot[4]. The discussion is also supported by Indonesian data.

The issues to be discussed are (i) how core status is determined, (ii) how core status might be changed, (iii) what motivates the change, (iv) what parameter can be formulated to account for typological variations associated with the answers of the foregoing questions.

The present research suggests that being core is a complex matter involving morphosyntax-semantic interaction and, crucially, pragmatic prominence. The investigation in these languages confirms the notion of prominence in language system, particularly in argument-structure (Manning 1996; Arka 1998; Arka and Manning to appear; Foley 1998a, 1998b). Data from the isolating group lead to the proposal that mapping and core status may be determined, not only by lexicon/morphology, but also by pragmatics via syntax. The analysis, couched within LFG, is an a-str-based version of the parameterized properties in voice system and object doubling as discussed in Foley (Foley 1998a; Foley 1998b))

The paper is organized as follows. First of all, a short typological description of the basic facts is given, which includes word order (2.1) and marking (2.2). The important data on core alternations and the associated pragmatic aspect follow (2.3). Then, in section 3, the analysis is given. It covers the discussions on voice and argument structure in LFG (3.1), mapping and marking strategies (default and marked), their relation with parametric

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[1] Balinese is mainly spoken in the island of Bali (with the speakers of around 3 millions). For detailed discussion on Balinese linguistics, see (Arka 1998; Artawa, Artini, and Blake 1997; Artawa 1994; Beratha 1992; Clynes 1995; Hunter 1988; Pastika 1999; Wechsler and Arka 1998)

[2] Bima is spoken in the eastern part of Sumbawa island with around 600.000 speakers. See Jauhary (Jauhary 2000) for discussion on passive in this language

[3] Manggarai, Lio and Sikka are three languages (among the languages) spoken in the island of Flores with the speakers of around five hundred thousands, two hundred thousands, and two hundred and fifty thousands respectively. See further details in Kosmas (Kosmas 2000) for Manggarai, Sawardi (Sawardi 2000) for Lio and Sedeng (Sedeng 2000) for Sikka.

[4] Lamaholot is spoken in the islands east of Flores such as Adonara, Solor and Lembata (around two hundred thousand speakers). The present study is based on the Nusa Tadon dialect spoken in the island of Adonara, as discussed in Japa (Japa 2000).

principles of voice system and object doubling, and evidence for voice alternations as mapping alternations (3.2)-(3-3). Further support for the significance of being core in voice alternations is given from the restriction it places on possible binding relations (3.4). Finally, conclusion is given in 4.

2 Basic facts about the languages under investigation

2.1 Word order

The languages discussed here are all SVO languages as shown by (1)[5].

(1) a. Tiang numbas tamba (Balinese) (h.r.)[6]
1 AV.buy medicine
'I bought medicine'

b. Dia me-lihat saya (Indonesian)
3SG AV-see 1SG
'(S)he saw me'

c. Sia na-weli-ku baju. (Bima)
SG 3-buy-ADV shirt
'(S)he really bought the shirt'

d. Hia ongga ami (Manggarai)
3SG hit 1Plex
'(S)he hit us'

e. Ata nuwamuri ghea pai ema (Lio)
person young that call father
'The young person called father'

f. Mame rena naruk ia (Sikka)
uncle hear news that
'Uncle heard the news'

g. Go'e plei Budi (Lamaholot)
1SG hit NAME
'I hit Budi'

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[5] AV in (1) stands for Agentive/Active Voice, where the Agent is the grammatical subject. Voice is marked differently across the languages under investigation. In the languages of the synthetic type such as Balinese, it is morphologically marked, and consequently there is morphological opposition of verbal forms signaling different voices. A verb form in this language is therefore glossed showing the relevant voice, as in Balinese example (1), where the verb initial nasal is the AV marker. In the languages of the analytic type there is no such morphological opposition. The verb is not therefore glossed for the relevant voice.

[6] h.r. = high register; low register is not marked.

In these sentences, the head predicates are transitive verbs with the agent arguments appearing preverbally functioning as the grammatical subjects (henceforth, SUBJ). The evidence of their being SUBJs comes from relativization, a property unique to the grammatical subject in these languages. The following contrast from Lio, for example, shows that relativizing the SUBJ *ata nuwamuri* 'young man' is fine (2a) (the relevant clause being within brackets) whereas relativizing the object *ema* 'father' is prohibited (2b):

(2) a Ata nuwamuri [eo __ pai ema] mai (Lio)
person young [REL call father] come
'The young man who called Father came'

b * Ema [eo ata nuwamuri pai __] mai
father [REL person youth call__] come
'Father whom the young man called came'

The SVO is the canonical order (i.e., pragmatically unmarked). Word order variation is highly constrained and is sometimes not possible. Alternative ordering of Patient coming sentence initially, particularly in the isolating group (to be discussed shortly in 2.2.) gives rise to a pragmatically marked construction. This is not simply an object preposing construction; rather it is an Objective Voice construction with the Patient being SUBJ.

2.2 *Marking*

2.2.1 Head marking: Indonesian, Balinese, Bima and Lamaholot (relatively rich in morphology)

The AV verb in Balinese/Indonesian is morphologically marked whereas the AV counterpart in Lamaholot is morpologically unmarked. In Balinese, the AV is marked by a (homorganic) nasal prefix (*ng-* as in (3a)) and in Indonesian by *meN-* (as in (3b)). In all of these AV constructions, the Agent is the grammatical subject coming before the verb and the patient is the object coming after the verb.

(3) a. Tiang ng-lempag ipun (Ag Verb Pt) (Balinese) (h.r.)
1 AV-hit 3
'I hit him'

b. Saya mem-(p)ukul dia (Ag Verb Pt) (Indonesian)
1SG AV-hit 3SG
'I hit him/her'

c. Na'e na'a go'e (Ag Verb Pt) (Lamaholot)
3SG hit.AV 1SG
'S/he hit me'

The three languages allow another alternative structure shown in (4), labeled here as Objective Voice (OV). The OV verb is, like the AV verb, syntactically transitive because the Patient of the OV verb is core. The Patient is the grammatical subject (SUBJ), coming sentence initially), and crucially, the Agent is still core, not demoted to non-core status[7]. As in the AV verb marking, the OV marking in Balinese/Indonesian and Lamaholot shows an opposite strategy: the OV verb in Lamaholot is morphologically marked whereas the OV verb in Balinese/Indonesian is not. The following are the OV versions of (3):

(4) a. Ipun lempagtiang (Pt Verb Ag) (Balinese)
3 OV.hit 1
'Him/her, I hit'

b. Dia saya pukul (Pt Ag Verb) (Indonesian)
3SG 1SG OV.hit
'Him/Her, I hit'

c. Go'e na'e na'a-nek (Pt Ag Verb) (Lamaholot)
1SG 3SG hit-OV.1SG
'Me, (s)he hit'

The set of the OV markers in Lamaholot and the corresponding free pronouns are shown in the following Table[8]:

Table 1 OV suffixes and their corresponding Free Pronouns in Lamaholot

Free pronominals	1SG	1PL.EX.	1PL.IN.	2SG	2PL	3SG	3PL
	go'e	kame	tite	mo'e	mio	na'e	ra'e
OV-marker	-k	-m	-t	-o	-e	-o'	-we

Unlike Balinese and Lamaholot, Bima does not have OV; it has passive. Verbs showing active voice (AV) and passive (PASS) voice in Bima are equally marked (Jauhary 1999). The active voice (AV) is marked by verbal affixes showing agreement with the SUBJ, with the prefix signaling IRREALIS and the suffix signaling REALIS (perfective aspect):

(5) a. Sia na –mbei ana dou ede buku (Bima)
3SG 3.IRR-give child person that book
'(S)he is going to give the child a book'

[7] That the agent of the OV verb is still core (hence the OV verb is not a passive verb) has been argued at length in Arka (1998) for Balinese. Binding provides evidence for this (see 3.3).

[8] The suffixes may have allomorphs: the ones that are expressed by consonants –k, -m, and -t may have a schwa insertion if the verb base ends with a consonant (e.g. -ə̀k '1SG' in *wə̀ot-ə̀k* 'kick-1SG') and another additional nasal *-n-* if the verb base ends with a vowel (e.g. -n k as in *sika-nə̀k* 'expell'). However, there may be variation with *–r-* as in *tobo-nə̀k* or *tobo-rə̀k* 'sit-1SG'. Simon, a native speaker of this language, (p.c.) suggests that this variation is dialectal. Further examination is needed to confirm this claim.

b. Nahu nduku-ku[1] sia
1SG hit-1SG.REAL 3SG
'I have hit him/her'

The prefix *na-* in *namebi* (5a) agrees with the agent-SUBJ *sia*, which comes preverbally. Likewise, the verbal suffix *–ku* in (5b) agrees with the SUBJ *nahu*. The other arguments appearing after the verb are the objects.

Passive is marked by a prefix: *di-* is for IRREALIS and *ra-* for REALIS[9]. The prefix shows no agreement with the SUBJ. The following is an example of the *ra-* passive:

(6) Mbe'e ede ra-nduku ba ompu sia
goat that PAS.REAL-hit by grandfather 3SG
'The goat was hit by his/her grandfather'

In short, a verbal affix in Bima may simultaneously express (i) modality/aspect, and (ii) grammatical function mapping (possibly with SUBJ agreement). The set of verbal affixes showing voice in Bima are shown by the following Table:

Table 2 Verbal affixes in Bima

Function-mapping ⇒	(1) Actor = SUBJ (core)		(2) Actor = OBL (non-core)
Modality/Aspect ⇓	(1a) PREFIX	(1b) SUFFIX	PREFIX
IRREALIS	*ka-* '1SG/1PL.In' *ta-* '1PL.Ex' *na-* '3'		*di-*
REALIS		*-ku* '1SG/1PL.Inc' *-ta* '1PL.Ex' *-mu* '2' *-na* '3'	*ra-*

2.2.2 Non-head marking: analytic group, poor in morphology: Manggarai, Sikka, and Lio

This group of languages (Lio, Sikka, and Manggarai) rely on word order to encode grammatical relations. Voice appears to be analytically encoded. That is, verbs with different grammatical relations/voices have different linear ordering with respect to their arguments; morphologically the verb forms are the same.

[9] Passive in Manggarai may have no verbal marking. It is only signaled by syntactic appearance of the Agent as an Oblique, expressed in a PP. In such a case, it is like voice in the neighboring isolating languages where voice is analytically endoced.

Manggarai, for example, which has no OV, makes use the same verb form *ongga* 'hit' in two different grammatical relations/voices, in the active construction (7a) and in the passive construction (7b).

(7) a. Hia **ongga** ami (Active) (Manggarai)
3SG hit 1Plex
'(S)he hit us'

b. Ami **ongga** le hia (Passive)
1Pl.Ex hit by 3SG
'We were hit by him/her'

As argued by Kosmas (2000), sentence (7b) is syntactically passive, with the agent PP being an Oblique, and the patient *Ami* is the grammatical subject (see also evidence from binding discussed later in (3.4) and further details for subjecthood in Manggarai in Kosmas 2000).

Unlike Manggarai, Lio and Sikka have no passive. They have the analytic OV construction; that is, the OV construction that is marked by different linear order. The OV verb is morphologically the same as that in the AV construction. Thus, voice alternations in these isolating languages correlate with no verbal morphology. For example, the verb *tebo* 'hit' in Lio (8) and *rena* 'hear' in Sikka (9) are associated with AV and OV. The (a) sentences are equivalent to the AV construction in Balinese and Lamaholot whereas the (b) constructions are equivalent to the corresponding OV construction.

(8) a Kai ghea **tebo** aji (Agent-V-Patient) (AV) (Lio)
3SG that hit younger.sibling
'S/he hit the little brother/sister'

b Aji kai ghea **tebo** (Patient-Agent-V) (OV)
younger.sibling 3SG that hit
'The little brother/sister, s/he hit'

(9) a. Mame **rena** naruk ia (Exp -V - th) (AV) (Sikka)
uncle hear news that
'Uncle heard the news'

b. Naruk ia mame **rena** (Th - Exp - V) (OV)
news that uncle hear
'The news, Uncle heard (or the news was heard by Uncle)'

In all, the clause initial NPs are SUBJs. The evidence for their being subject in these sentences comes from a number of tests exclusive to SUBJ in these languages such as relativization, adverbial insertion, control, and possessor ascension/topicalization. The following is the evidence from Lio (Sawardi 2000). Basically the same evidence holds for Sikka (see Sedeng 2000).

(10) (Lio)
Relativization:

a. Kai [eo __ tebo aji] mera leka kedera
3SG [REL __ hit little.sibling] sit on chair
'(S)he, who hit (our) brother sat on the chair'

b. *Aji [eo kai ghea tebo __] mera leka kedera
little.sibling [REL 3SG thathit __] sit on chair
'(Our) little sibling whom (s)he hit sat on the chair'

Adverbial insertion:

c. Aji [eo (meremai) kai ghea (*meremai) tebo __]
little.sibling [REL yesterday 3SG that yesterday hit

mera leka kedera
sit on chair

'(Our) little sibling whom (s)he hit yesterday sat on the chair'

Control:

d. Aku rop tau [__ pedhe are]
1SG try to (SUBJ) cook rice
'I tried to cook (the) rice'

e. *Aku ropa tau [are ina __ pedhe]
1SG try to [rice this(NON-SUBJ) cook]
'I tried to cook this rice'

(10) shows relativising SUBJ is fine (a), whereas relativising OBJ is not (b). Sentence initial SUBJ is in [Spec, IP] (or possibly adjoined to the top IP) whereas the OV agent is in [Spec, IP] (see (Guilfoyle, Hung, and Travis 1992)). This allows an adverbial insertion (*meremai* 'yesterday') between the SUBJ/relative marker *eo* and the VP including the Agent, but not between the Agent and the head verb (10c). In contrast to (10d), an attempt to control non-SUBJ fails (10e). All these tests support the view that the Patient initial argument is not simply a preposed OBJ because it acquires SUBJ properties whereas the Agent in this construction is not SUBJ. In other words, these constructions are OV constructions, not AV constructions with topicalized/preposed OBJs.

To sum up, the languages discussed here are all SVO languages but have different inventory of voice types. Table1 shows that they fall into three groups: (i) Indonesian and Balinese (with three major voice types), (ii) Bima and Manggarai (with AV and PASS, without OV) and (iii) Lio, Sikka and Lamaholot (with AV and OV, without PASS). I will

come back to the parametric principles that account for the voice distribution in these languages in (3.2)

Table 3 Language Groups in terms of Voice Types

Language		VOICE		
		AV	OV	PASS
Group 1	Indonesian	√	√	√
	Balinese	√	√	√
Group 2	Bima	√	-	√
	Manggarai	√	-	√
Group 3	Lio	√	√	-
	Sikka	√	√	-
	Lamaholot	√	√	-

2.3 Core alternation and pragmatic motivation

Direct functions (SUBJ, (DIRECT/INDIRECT) OBJ) are core arguments whereas Obliques (and also generally complex complements[10]) are non-cores:

The (default) number of core arguments, which an argument-taking predicate may have, is generally specified in a lexical entry. However, some process (e.g. applicativization) may change the core status of an argument. The change is generally morphologically marked. Applicativization illustrated by Indonesian data in (11)-(12) shows that a locative argument is promoted to core status. In the non-applicative verb *duduk* 'sit' (11), the locative argument is an oblique (11a); the locative oblique marker *di* cannot be omitted (11b); nor can the verb be passivized with the locative argument being SUBJ (11c).

(11) a. Amir duduk di kursi baru itu (Indonesian)
name sit on chair new that
'Amir sat on the new chair'

b. * Amir duduk kursi baru itu
name sit chair new that

c.* Kursi baru itu (yang) di-duduk oleh Amir.
chair new that REL PASS-sit by name
'It was the chair that Amir sat on'

[10] There is evidence from Balinese and Indonesian that a complex argument may be treated as a core (see Arka and Simpson 2000 for detail).

In contrast, in the applicative verb *duduk-i*, the locative argument is core. Therefore, the applied argument can be OBJ (12a) or SUBJ (12b); it can no longer take the OBL marker *di* (12c).

(12) a. Amir men-duduk-i kursi itu (Indonesian)
name AV-sit-APPL chair that
'Amir sat on the chair'

b. Kursi baru itu (yang) di-duduk-i oleh Amir
chair new that REL PASS-sit-APPL by name
'It was the chair that Amir sat on'

c. * Amir men-duduk-i di kursi itu
name AV-sit-APPL on chair that

In isolating languages, however, promotion to core status is not morphologically marked. The important point to note is that the locative argument cannot be promoted to be OBJ (13b). Compare this with the possible promotion in Indonesian (example (12a)).

(13) a. Wae buang ia **deri** ei kadera (Sikka)
face white that sit P chair
'The pretty girl sat on the chair'

b. * Wae buang ia **deri** kadera
face white that sit chair
'The pretty girl sat on the/a chair'

However, promotion to SUBJ is allowed (14a). This is parallel to the OV construction in Balinese (14b) and Indonesian (14c):

(14) a. Kadera ia wi wae buang ia **deri** (Sikka)
chair that REL face white that sit
'It is that chair which was sat on by the pretty girl'

b. Dampar-e entotegak-in tiang (Balinese)
bench-DEF that OV.sit-APPL 1
'The bench, I sat on (it)'

c. Kursi itu saya duduk-i (Indonesian)
chair that 1SG OV.sit-APPL
'The chair, I sat on (it)'

Manggarai shows a similar case, where promotion to core status/OBJ is generally not permitted (15b):

(15) a. Aku **puci** nggerone lo'ang (Manggarai)
1SG enter to in room
'I entered (into) the room'

b.* Aku **puci** lo'ang
1SG enter room
'I entered the room'

However, Manggarai does allow (16a), a typical construction of syntactic passive, parallel to the passive construction in Indonesian (16b). That is, the Goal/Locative 'room' can be a core argument but it must be SUBJ (i.e. topical). The Agent is obligatorily backgrounded/demoted to non-core status.

(16) a. Lo'ang hitu **puci** le ata tako (pass.) (Manggarai)
room that enter by person steal
'The room was entered by a thief'

b. Ruangan itu di-masuk-i oleh perampok (pass.) (Indonesian)
room that PASS-go.in-APPL by robber
'The room was entered by a robber'

The simultaneous foregrounding/promotion and backgrounding/demotion effect illustrated by (16) is typical in passive. Therefore, Manggarai (16a) is analyzed as an instance of passives.

The examples so far suggest that being core-SUBJ is closely associated with having a CONTRASTIVE FOCUS as in Sikka (14a), or being topical as in Indonesian and Manggarai (16). This leads to the hypothesis that pragmatic prominence motivates core status promotion. If promotion to core/SUBJ is licensed by pragmatic prominence, it is expected that promotion to OBJ must be permitted when OBJ gets proper pragmatic prominence. Indeed this is the case. Promotion to OBJ is acceptable only when there is contrastive FOCUS given to the OBJ, as in (17).

(17) Aku **puci** *lo'ang hitu* landing (Manggarai)
1SG enter room that but

hau **puci** *lo'ang ho'o*
2 enter room this

'I enter that room and you enter this room'

Summary:

- Core promotion/alternation is a way for an argument that is generally classified as non-core to have the privilege of being mapped onto a direct function, in particular to SUBJ, which naturally receives pragmatic prominence. (There may be semantic motivation, which is not discussed here.)
- Core status promotion and voice alternation may be morphologically marked on the verb (e.g. Indonesian/Balinese applicatives) or not (Lio, Manggarai, and Sikka).
- Promotion (of a non-core argument) can be directly to SUBJ; promotion to OBJ may be prohibited.
- Structurally, the promoted/demoted argument occupies a relevant (direct) argument structural position. Isolating languages rely heavily on the structural position to encode promotion/demotion.

Implication:

- A linguistic model must allow us to capture, at least, the following ideas. First, pragmatic prominence licenses core promotion and its related changes in categorial expression, structural order, and grammatical relation (in particular, SUBJ). Second, languages differ in their voice systems (and marking), which in effect, gives rise to typologically predictable different strategies in core status promotion (and also demotion) and mapping.

3 Analysis

The analysis proposed in this paper attempts to show how pragmatic prominence (TOP vs non-TOP, (CONTREASTIVE) FOCUS vs non-FOCUS) has a strong connection with syntactic prominence (SUBJ vs non-SUBJ and core vs non-core). This is couched within the Lexical-Functional Grammar (LFG) (Alsina 1996; Bresnan to appear; Dalrymple et al. 1995; Manning 1996), wherein parametric mapping principles may account for the typological restrictions of voice and core promotion.

3.1 Voice and Argument structure in LFG

In LFG, language system is modeled in terms of parallel structures consisting of:

- constituent structures (c-str): morphological/syntactic realizations of grammatical relations in terms of linear/hierarchical structure of categorial units (e.g. NP, VP, …);
- functional structures (f-str): surface grammatical relations (SUBJ, OBJ, …);
- argument structure (a-str): (see below);
- semantic structure (sem-str): argument-taking predicates and their arguments, and decomposition of these into primitive units as in Jackendoff (Jackendoff 1991) or Foley and Van Valin (Foley and Valin 1984). For simplicity, the sem-str will be represented by the traditional semantic role labels (Agent, Ben/Goal, Patient, …).

Each structure is an independent structure with its own properties and constraints. The parallel structures are linked with each other by mapping or linking principles. Underlying

the mapping is structural prominence, which in general can be defined on any level. Three structural layers highlighted throughout the discussion in this paper reveal three kinds of 'subjects':

- .SUBJ(ECT) (conventionally written with capital letters) is the surface/grammatical subject, the most prominent function in f-str. It can be any role. So far observed, at least in the languages discussed here, it must be a core argument, not necessarily the most prominent core argument.
- A-subj(ect) is the a-str subject, the most prominent core argument in the a-str. Like SUBJ, it can be any role, not necessarily an Agent.
- Logical subject (l-subj) is the most prominent argument in the sem-str, typically this is the Agent.

For the purpose of our discussion in this paper, I adopt a version of a-str, namely the syntacticized a-str, wherein information about core (term) status is important (Manning (19 96) Arka (1998) Wechsler and Arka (1998), Arka and Manning (to appear)):

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

For simplicity, a lexical entry of an argument-taking predicate, e.g. 'hit' and 'sit', will be represented as (19). The list of semantic roles in the sem-str should be understood as shorthand of an elaborate sem-str (e.g. as in Jackendoff-style structures). The a-str is also represented as a list of (default) core and non-core argument with the following conventional notations. (i) The left most is the most prominent core argument (i.e., a-subj). In (19a), for example, the a-subj is by default the Agent. However, as we will see, the a-subj can be any semantic roles. (ii) The sets of core and non-core are distinguished in the a-str representation by internal bracketing, with the core set being the left one. For the verb 'sit' (19b), for example, the a-subject is the leftmost and internally within different brackets from the second non-core argument that is normally associated with the Locative argument. In case where all arguments are cores as in (19a), no nested brackets are given.

(19)	(a)	(b)
a-str:	'hit' <___ , ___>	'sit'< <___>(<___>)>
	(a-subj)(a-obj)	(a-subj)
sem-str:	(Ag) (Pt)	(Ag) (Loc)

One important consequence of the a-str ranking stated in (18c) is worth mentioning here: if an Agent is core it must be the most prominent argument in the a-str. This is stated in (Bresnan and Kanerva 1989; Bresnan and Zaenen 1990) as an intrinsic classification of Agent represented in (20a), where [-o] means that an Agent cannot be syntactically an object. In the view adopted here, an agent cannot be an a-object[11] ((20b.ii):

(20) a. <Agent>
|
[-o]

b. (i)
<a-subj, a-obj>
| |
Agent Patient

(ii)
b * <a-subj, a-obj>
\ /
Agent Patient

(iii)
c. <<a-subj><__>>
\ /
Agent Patient

Thus, an Agent has only two possibilities for its a-str linking. If it is core, being thematically the highest argument, it outranks other arguments (core or non-core) yielding the straight through mapping shown in (20a). Otherwise, it should be non-core, which then outranks other arguments in the non-core group. In this case it is less prominent than a core argument. This gives rise to a cross mapping (20b.iii). If it is a core argument, the Agent cannot be the second prominent (i.e. the a-object) as shown by the cross-mapping in (20b.ii) because this violates the a-str principle stated in (19c.ii). In short, being a core for an agent means being the a-subject; otherwise it should be demoted to non-core status. We shall see later that much of the restriction in possible function alternations is a logical consequence of the principle associated with the a-str prominence stated in (18c).

3.1.1 The a-str-based mapping principles

In what follows, I shall show the a-str-based account for Voice. The discussion mainly deals with typologically three most common voices: AV, PASS and OV. I argue for the claim that voice is essentially semantics-syntax mapping via the syntacticised a-str. The proposed a-str as an intermediate structure allows us to provide a unified account for different kinds of passives, including the ones that have no apparent active counterparts as observed in the isolating language like Manggarai (see below 3.2.2).

There are different versions of mapping theory in LFG. The one adopted here is a version where mapping onto surface syntax involves an a-str linking, with the a-str properties formulated earlier in (18).

The main explanation of typologically different voices from a mapping perspective is the ideas that (i) each structural layer (*sem-str*, *a-str*, and *f-str*) has its own constraint and

[11] Note that the notion of a-object is not exactly the same as that of the surface OBJ, even thought a-object is naturally also linked to OBJ. An a-object can be SUBJ as in the OV verb discussed throughout this paper. OBJ is technically a function, which is classified as direct/core, but negatively defined as being not SUBJ and not OBL. As argued at length in Arka (1998) (also in Kroeger 1993), an Agent appearing in the OV construction can be technically an OBJ in this sense. Admittedly, however, the idea of Agent-OBJ is not well accepted in the linguistics community.

prominence (Bresnan 1982, 1995a, 1995b, 1995c, Dalrymple 1993, among others), (ii) the correspondences among the structural layers are not always straight. Mapping showing a prominence mismatch is natural. Mapping may even split, where a single semantic argument receives two syntactic realizations (see Arka and Simpson 2000). These give rise to different voices (Active Voice, Objective Voice, and passive voice) and possibly raising involving these voices.

The a-str-based mapping principles formulated in (21) are operative for the languages discussed here and are arguably so for other languages (despite the differences in morphological marking)[12].

(21) *Mapping (and Marking):*

I. SUBJ selection: SUBJ must be a core argument

a. AV: map an Agent a-subject/core argument onto SUBJ

b. OV: map a non-Agent a-object/core argument onto SUBJ

c. PASS: Map a non-Agent a-subject/core argument onto SUBJ

II. Complement function:

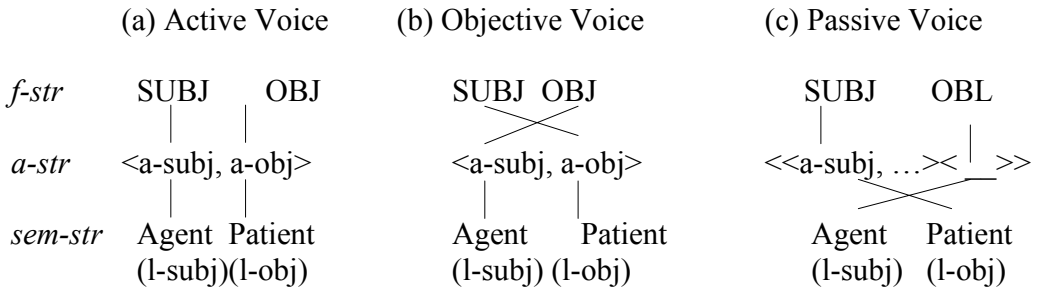
Map the other core(s) onto OBJ(s)

III. OBL non-core

PASS: treat an agent as a non-core, map onto OBL

The representations in (22) shows explicitly possible mappings of (21) in the parallel structures: AV shows a straight through mapping (22a), OV shows crossing lines of mapping from a-str to f-str (22b), and PASS shows crossing lines of mapping from sem-str to a-str (22c).

(22)



To sum up, the proposed analysis treats voice alternation as mapping alternation, involving an intermediate a-str structure, where core status is crucial. In this way, we can account for the close relationship between voice alternations and core alternations. As we shall see, voice alternation may also force core alternation.

[12] The PASSIVE mapping principle stated in (21.III) which gives rise to the mapping shown in (22c) holds only for one kind of passive. The principle needs to be revised/extended to cover cases where the passive Agent is optionally expressed as an oblique, or is obligatorily suppressed.

3.1.2 Default mapping and marking

Since mapping is in principle predictable, it need not be specified in a lexical entry. As exemplified in (19), lexical entries for 'hit' and 'sit' are specified with a-str and sem-str without mapping. The question then is when/where mapping is done.

Typologically different strategies employed by languages to encode voice/mapping suggest that mapping is not solely done in morphology/lexical component of the grammar.

Conventionally, mapping in LFG is believed to be a lexical process. It is completed in the morphological component. Thus, certain verbal morphology that marks voice must be specified as imposing a specific constraint in mapping. In Indonesian, for example, the prefix *meN-* (see example (3b)) imposes the AV mapping specified in (21.I.a). Given the entry of *pukul* (23a), the affixation with *meN-* imposes the AV mapping. The AV SUBJ selection principle (I.a) maps the Agent core/a-subj onto SUBJ, and the complement mapping map the patient core to OBJ (II) (23b). The derived verb *memukul* then emerges from the morphological component complete with its function specified (23c).

(23) a. Entry for a verb:

/pukul/ V 'hit' < __ , __>
(Agent)(Patient)

b. Affixation with *meN-*:

SUBJ OBJ
| |
/memukul/ V 'hit' < ___ , ___ > (then Pt = OBJ)
| |
(Agt) (pt)

c. memukul 'hit' <SUBJ, OBJ>

Likewise, the Lamaholot *–nek* (example (4c) imposes the OV mapping (21).I.b (with additional agreement); and Biman Passive *ra-* (example (6)) imposes the PASS mapping (21).I.c) and (21).III.

In short, the morphological process involving a voice marker (i) takes a lexical entry (that is unspecified for mapping) as its input and (ii) gives the c-str tree, as its output, a fully derived word/verb complete with its mapping. If no specific marking applies, a default mapping is operative. Generally, in an accusative language, this is associated unmarked AV mapping, the straight through mapping, where prominence across structures matches as shown in (22a). However, as noted, technically, in Austronesian languages such as Bima discussed here, there may be no unmarked mapping. All voices are morphologically marked.

The question now is how about the bare verb (glossed as OV in languages like Balinese and Indonesian, or those in the analytic group such as Sikka, Lio and Manggarai)? The problem with this verb is that morphologically it may be unmarked (as in Balinese and Indonesian), but pragmatically it is associated with a marked reading.

There may be at least two approaches to this. First, we assume a zero OV prefix as in Balinese/Indonesian; then adopt the conventional view that verbs emerge fully derived, complete with mapping. Second, analyze words as emerging unspecified/partially specified for mapping; and they rely on pragmatics, via syntax, for specific mapping. The first approach is essentially treating the unmarked verb as marked (by a zero affix), where a specific mapping is imposed. This may work well with Balinese and Indonesian, which have morphological contrast in the verbal morphology. The first approach appears to have a problem in isolating languages, such as Lio and Sikka, since AV/OV/PASS may in this analysis all have zero morphemes. The second approach does not have the same problem since it does not analyze the bare verb as having a zero morpheme. All verbs emerge from the lexicon are unmarked, both in morphology and in mapping. Default mapping and 'marked' mapping are defined analytically, not morphologically.

To illustrate the second approach, consider again the core alternation from Sikka (13)-(14) repeated here as (24):

(24) a. Wae buang ia **deri** ei kadera (unmarked) (=13a) (Sikka)
face white that sit P chair
'The pretty girl sat on the chair'

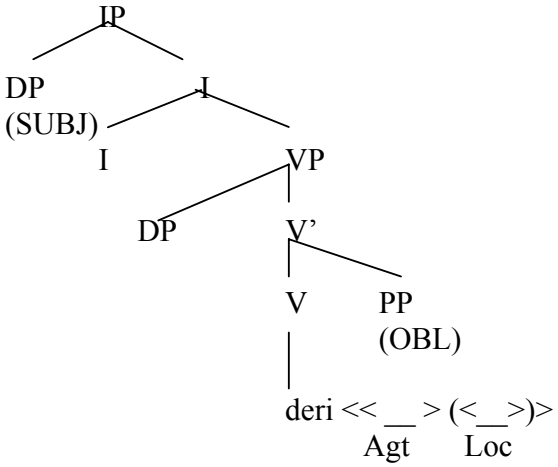
b. Kadera ia wi wae buang ia **deri** (marked) (=14a)
chair that FOC face white that sit
'It is that chair which was sat on by the pretty girl'

The verb *deri* 'sit' can be thought of as having a lexical entry with an a-str consisting of one core and one non-core shown in (25a). This a-str with unspecified linking appears in the terminal node of the c-str (25b).

Sikka:

(25) a. /deri/ V 'sit' << __> (<__>)>
(Agent)(Loc)

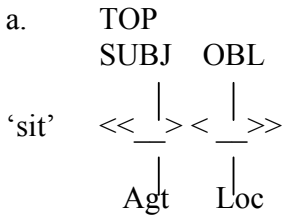
b.



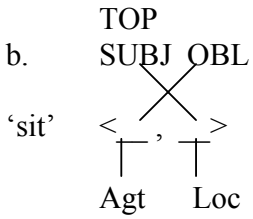
Any verb in Sikka will appear in the c-str having its mapping unspecified. It needs information from discourse via syntax, e.g., (i) whether the Agent or the Locative is topical, (ii) whether the DP in [Spec, IP] is a possible Agent/Locative, (iii) whether the DP in Spec, VP is a possible Agent or not, and whether there is a complement PP with a Locative marker. All these sorts of information interact to fix the mapping.

In any case, the grammar allows only two possibilities. First, if the Agent is topical NP, then the straight through mapping with unmarked order/reading is arrived at. The Agent TOP forces the canonical mapping of agent onto SUB/DP, where SUBJ is the default TOP. Structurally, it comes sentence initially ([Spec, IP]). This makes the Agent map onto a-subj/core (26a). Second, if the Locative is topical/NP, a marked mapping/reading is arrived at. The topical Locative must be mapped onto TOP/SUBJ position (sentence initially), which requires it to be core. However, since Sikka has a symmetrical voice system without passive, this means that the Locative must be promoted to core status but it cannot be the a-subject because it is thematically lower than the Agent. This gives rise to the OV construction, whose mapping is shown in (26b). This is a marked structure because the Locative appears sentence initially and the Agent comes later in the sentence.

(26) a.



b.



(unmarked order →default mapping) (marked order → marked mapping)

To sum up, since isolating languages rely heavily on pragmatic information for a specific mapping via syntax/constituent order, where (un)marked mapping/reading correlate with (un)marked order, verbs in these languages are believed to have their mapping completed in syntax, rather than in morphology.

Even in a language that has rich verbal morphology for voice, there is evidence that the information from syntax is crucial for core status selection. In Indonesian, for example, the prefix *di-* is widely accepted as the PASS marker. A close examination of its property (Arka and Manning to appear), however, reveals that this view is not totally right (even though it is not totally wrong either). It is, in fact, only a non-actor oriented marker, which requires that the non-actor argument be mapped onto SUBJ. The specific core status of the Agent is later determined in syntax, possibly with the input from the pragmatics (e.g., its topicality; see (Purwo 1989)). The evidence comes from the contrast in binding property between (28a) and (28c) despite of the fact that both have the same *di*-verb, namely *di-utamakan*:

(28) a. Diri-nya di-utamakan=nya (*-nya* is core = OV) (Indonesian)
self-3 di-prioritise=3
'(S)he prioritized himself/herself'

b. Diri-nya dia utamakan (OV)
self-3 3 OV.prioritize
'(S)he prioritized himself/herself'

c. ?*Diri-nya di-utamakan oleh=nya/AMir (*-nya* is not core = PASS)
self.3 di-priorotize by=3/name
'Himself was prioritized by him/Amir'

(28a) shows that the reflexive SUBJ *dirinya* can be bound by the Agent *–nya*. On the contrary, reflexive SUBJ in (28c) cannot be bound by the Agent in (28c), which is overtly marked by *oleh* (the agent OBL marker). Note, binding (28a) patterns with binding in the OV verb (28b). In short, the *di*-verb only partially specifies the mapping that its non-Agent is SUBJ (shown by indexing *i*):

(29) Partially specified linking of *di-:* SUBJ = non-actor

/di-/ $SUBJ_i$

< __, __, …>

A Non-A $_i$

This partial linking does not say anything about the core status of the Agent and non-Agent arguments. Thus, the di-verb in the terminal node of the c-str awaits information from somewhere else, outside morphology, to fix the mapping by which the core status of the two arguments are determined. If there is a complement PP imposing an OBL Agent marked by *oleh*, then the passive mapping is arrived at. Or else, if *–nya* is cliticized to the head verb without *oleh*, then the OV mapping is the result. In either case, if the non-agentargument is a reflexive, binding constraints are operative. Since in Indonesian, binding is sensitive to core status prominence in the a-str, it is expected that the two different constructions showing different mappings/voices lead to different patterns of binding. More examples for binding evidence is given in (3.2).

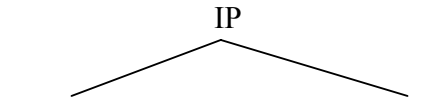
How can the interaction of different kinds of information be captured? In LFG, this is handled by means of annotated c-str of the type shown in (30). The technical detail of the formal architecture and instantiation of variables represented by up and down arrows will not be discussed.

The basic idea is that the annotated c-str shows the correspondences/mappings across structures with the following information and constraints:

1. Pragmatic prominence and linear order (see (Choi 1996)): An argument bearing certain pragmatic prominence (specified here as bearing DF comes sentence initially. In (27), this is shown by left branching of [Spec, IP], and the DF occupies the Spec position. It can be also adjoined to the IP, but it must have certain relativiser/focus-marker associated with this SUBJ position.

2. Pragmatic prominence and semantic role: The equation (↑DF)= ↑α ARG-□ says that a thematic role can be linked (by a special mapping of ↑α) to a DF (TOP/FOC). This is to represent a direct relation between pragmatic structure and semantic relation allowing us to express the idea that a certain role is given pragmatic prominence.
3. Categorial expression, linear order and grammatical realizations: the argument assigned pragmatic prominence, if expressed as DP/NP, must be SUBJ. (Note that a unit given pragmatic prominence may be simply a preposed unit expressed by PP, which is not SUBJ.)

(30)



(↑DF)= ↓
(↑DF)= ↑α ARG-□
(↑SUBJ)= ↓

DF (Discourse Function) = {C-FOC, C-TOP, DEFAULT-TOP}
ARG-□ (thematic argument) = {agent, ben/exp, goal, instr, th/pt/, loc, …}

The restriction in (3), which requires an argument be SUBJ, is imposed by the combination of all the equations associated the DP in the [Spec, IP] position as shown in (30). This means, however, that if it appears in another position in the c-str, this restriction does not apply. In this way, we correctly allow that pragmatic prominence is not an exclusive property of SUBJ. It might be the case that, as demonstrated by data (15) from Manggarai, an OBJ can bear a C-FOC, which licenses the promotion of a low-end role such as locative to core status.

The representation in (30) appears to apply for both isolating and non-isolating languages discussed here, irrespective of where the mapping is done. The same pattern emerges: pragmatically unmarked reading is associated with the straight through mapping, where (i) prominence matches, as shown in (22a), with the Agent being SUBJ; (ii) structurally it is sentence initial (in [Spec, IP]), (iii) it is pragmatically the most prominent (generally the default TOP). It is argued that, despite the absence of voice morphemes, these languages do have (analytic) voices, AV, OV and PASS.

Two point to conclude. First, words emerging from the morphological component may or may not have the core status of a semantic role specified. In the LFG model adopted here, where information spreading is in a two-way direction in the c-str tree, the idea that the relevant information for voice/core status selection may come from pragmatics via syntax may be captured. Second, promotion/demotion is judged from the perspective of the unmarked mapping, which cannot be solely determined by morphological marking. Thus, promotion of a Locative argument takes place when in the unmarked mapping/reading its status is non-core whereas in the marked reading/mapping, its status is core. This process may be both morphologically and analytically encoded as in Balinese

and Indonesian; or, it is only encoded analytically as in Manggarian and Sikka. The process is arguably the same, despite the differences in encoding strategies.

3.1.3 A-str based account for (a)symmetricality system

3.1.3.1 Parametric variations

Having established the idea that the notion of voice is also relevant for the isolating language, we can now explain the implication of voice system, core prominence and syntactic promotion/demotion of an argument.

Possible voices and the related restriction in core prominence and mapping appear to be regulated by two parameterized properties: (i) symmetricality in voice systems and (ii) symmetricality in object doubling (Foley 1998a; Foley 1998b). The a-str-based formulation of the two is given in order below.

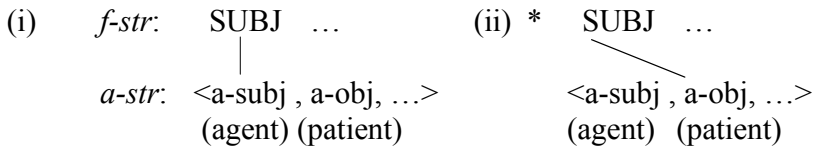
The parameter setting, formulated in (30) gives rise to typologically two different voice systems. The point languages differ is whether a non a-subject is or is not allowed to be mapped onto SUBJ. If a language allows either way, then the language has a symmetrical voice system, otherwise it has an asymmetrical system.

(31) **Voice System Parameter**:

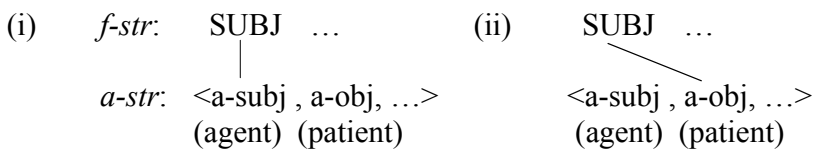
1. Asymmetrical: Only the most prominent core argument (i.e. the a-subject) can be mapped onto SUBJ
2. Symmetrical : Either the a-subject or the a-object can be mapped onto SUBJ

The two voice systems with explicit possible mappings and their representing languages are shown in the parallel structures below (32). (Note that the inclusion of semantic roles in the a-str representation is simply to encode a typical association of thematic ranking of two core arguments; the a-subject can be any role.)

(32) a. Asymmetrical Voice System
(Bima, Manggarai, …)



b. Symmetrical Voice System
(Balinese, Indonesian, Lio, Sikka, Lamaholot, …)



A language with asymmetrical voice system (e.g., Bima) will bar Patient-a-object-SUBJ mapping (32a.ii). Therefore, to link a core patient to SUBJ, this languages must employ PASS, whereby the patient is promoted to a-subject status, satisfying the asymmetrical constraint for SUBJ selection. This is the only possible choice for the Patient to be mapped onto SUBJ. In contrast, a language with symmetrical system allows the Patient core to be 'directly' mapped onto SUBJ without its acquiring a-subject status (i.e. by means of OV, (32b.ii). Thus, OV does the job of PASS, and understandably why a language having symmetrical voice system (e.g. Lio, Sikka) does not need to have passive. There is no reason, however, why this language type should be prohibited from having PASS (e.g., Balinese and Indonesian) because PASS does not violate any mapping constraint stated in (30)-(31)[13].

For double object constructions (i.e., ditransitive verbs), languages may have an additional constraint responsible for variations in function alternation of the two objects. Languages vary with respect to whether both OBJs can alternate with SUBJ. A language that allows only one object to alternate is referred to as a language with asymmetrical objects. The constraint responsible for this is referred to as the Asymmetrical Object Principle (AOP) (Bresnan and Kanerva 1989; Bresnan and Moshi 1990). The a-str-based version of AOP can be formulated in (33):

(33) The a-str based Asymmetrical Object Principle (AOP) (for non-agent SUBJ mapping)

(a) The least prominent core in the a-str (i.e., the lowest/third core/second a-object) of a ditransitive predicate cannot be mapped onto the highest function (i.e. SUBJ).

(b) *f-str*: * SUBJ …

a-str: <(a-subj),(a-obj), a-obj>
(th/pt)

The AOP (32) says that the second a-obj (in a ditransitive structure), generally the theme core, (also called OBJ2, or OBJ theta) cannot alternate with SUBJ. It also captures cross-linguistic generalization that the OBJ that is allowed to alternate with SUBJ is the direct OBJ (i.e., the only a-object of a monotransitive predicate), irrespective of the AOP. In case that the language imposes AOP, this is the first a-object for a ditransitive predicate. Due to the thematic ranking within core arguments, the first a-object must be thematically higher than the Theme; hence generally it is the Benefactive/Goal argument.

[13] In contrast, it is predicted that a language with asymmetrical voice system cannot have OV. The question then is why certain languages with symmetrical system (like Sikka and Lio) do not have passive. There must be typologically a further sub-parameter/constraint in the symmetrical group in that the agent-a-subject, even though it is indefinite, to be retain in the a-subject status. The evidence for this is the fact that what would be passive with an unknown/indefinite/deleted agent in other symmeterical languages is expressed in OV with an explicit indefinite/generic agent something like *the car was stolen by someone/people.*

The next subsection will discuss the consequence of how the a-str propeties of a predicate and the relevant voice system in the language and the possible additional AOP may determine possible voice/core/function alternations.

3.1.3.2 Restrictions of possible voice/core/function alternations

The restrictions imposed by a-str properties and their interaction with the (a)symmetrical voice system show up in cases like (i) passivization that appears to have no OBJ→SUBJ alternation, but rather OBL ←→SUBJ alternation, (ii) passivization is syntactically not a transitivity decreasing process, (iii) a ditransitive structure are only allowed in the OV construction, and (iii) applicativisation may simply promote a non-argument to an Oblique argument, which is obligatorily present. These will be presented in order.

Consider again the data from Manggarai in (15) and (16), repeated here as (34). The verb *puci* 'sit' is an intransitive predicate whose lexical entry is abbreviated in (34s), where (i) its a-str specifies one core and one non-core, and (ii) its sem-str specifies that it involves a sitter (an Agent) and a place for the sitting (Locative). Given this information, there can be only two possibilities. The first is the unmarked mapping/reading. This straight through mapping gives rise to a normal intransitive structure of (34b), with the Locative being an OBL. The second possibility is the marked reading/mapping, where the Locative is made SUBJ (for some pragmatic reason). Crucially, because Manggarai has an asymmetrical voice system, the SUBJ must be the a-subject. This in effect prevents the Agent from being mapped onto the a-subject position. As a result, a passive (intransitive) shown in (34c) is arrived at. Promotion of the Locative to core-OBJ status yielding a transitive active structure (34d) is predictable not acceptable. This is because, if there is no pragmatic motivation for the Locative, then the default mapping with the a-str/sem-str in (34a) will be operative, by which the Locative must be non-core (OBL), not OBJ.

(34) Manggarai

a. *puci* 'sit' << __> (<__>)>
(Agt) (Loc)

b. Aku **puci** nggerone lo'ang (=(15a))
1SG enter to in room
'I entered (into) the room'

c Lo'ang hitu **puci** le ata tako (PASS.) (=(16a))
room that enter by person steal
'The room was entered by a thief'

d.* Aku **puci** lo'ang *(AV) (=(15b))
1SG enter room
'I entered the room'

In short, no OBJ→ SUBJ alternation is observed in this passivization because the active (34d) is not acceptable.

Passivization of a transitive base *pande* 'make' in (35) exhibits the same property, where a direct promotion to the a-subject in passive is observed. The verb can be thought of as having an entry shown in (35a), then all the (im)possibilities in (b-f) can be accounted for. The straight through mapping yields the unmarked construction (35b). Passivizing the theme-SUBJ yields (35c). In both cases, the Benefactive is OBL marked by *te*. These are straightforward.

Notice that promotion of the Benefactive argument to OBJ (33d) is not allowed whereas the promotion to SUBJ (in passive) (33e) is fine. The badness of (33d) is due to the general constraint in the language that there is no ditransitive structure. In addition, unlike SUBJ, OBJ normally does not carry pragmatic prominence necessary for the core status promotion. If there is no motivation for core promotion, then the default mapping is operative with the a-str specification of (35a), yielding the canonical structure (35b) and not licensing the structure with three cores (35d).

In short, the Benefactive is directly promoted to a-subject/SUBJ by passive, kicking down the Agent to non-core status. This follows from the asymmetrical voice system imposed by the Manggarai grammar, where to be SUBJ it must be also the a-subject. In addition, being thematically higher than the Theme *layang-layang* 'kites', the Benefactive must outrank the Theme. Again, we observe that the conventional OBJ → SUBJ alternation in passive does not exist in this language because the active counterpart where the Benefactive is supposed to be OBJ is not acceptable. Finally, the badness of (35f) is also due to the violation of the asymmetrical voice system constraint.

(35) Manggarai:

a. *pande* 'make':

a-str	< __, __>	(<__, ..>)
sem-str	(Agent, theme)	(Ben)

b. Hia pande layang-layang **te hi Ali** SUBJ
3SG make kite-kite for Art name << '3SG','kite'><'Ali'>>
'(S)he made kites for Ali' (Agt) (Th) (Ben) (AV monotrans.)

c. Layang-layang pande le hia te hi Ali SUBJ
kite-kite make by 3SG for Art name <<'kite'><'3SG','Ali'>>
'The kites were made by him/her for Ali' (Th) (Ag) (Ben) (PASS)

d.*Hia pande **hi Ali** layang-layang SUBJ
3SG make Art name kite-kite * < '3SG', 'Ali', 'kite'>
'(S)he made kites for Ali' (Agt) (Ben) (th) (*AV ditrans.)

e. **Hi Ali** pande layang-layang le hia SUBJ
Art name make kite-kite by 3SG <<'Ali', 'kite'><'3SG'>>
'For Ali, the kites were made by him/her' (Ben) (Th) (Agt) (PASS)

f.* Layang-layang pande **hi Ali** le hia * SUBJ
kite-kite make Art name by 3SG <<'Ali', 'kite'><'3SG'>>
'The kites were made by him/her for Ali' (Ben) (Th) (Ag) (PASS)

Given the analysis here, both passive (33c) and (33e) can be thought of being 'derived' from the active (33b). Another point to note is that the a-str of the active (33b) and (33e) is exactly the same: two cores and one non-core. This means that passivization is not always a transitivity decreasing process. All these follow naturally from the mapping analysis presented here.

The passive facts in Manggarai reveal the following:

a) Direct promotion of a non-core argument to the core a-subject status confirms the idea that core arguments' ranking reflects thematic hierarchy;
b) The non-existence of OBJ-SUBJ alternation shows that to be passive SUBJ, an argument need not be an OBJ of an active sentence in the first place;
c) From the a-str based perspective of mapping, passivization is not always a detransitivizing process.

The following data from Lamaholot exhibit direct promotion to surface SUBJ, but unlike that in Manggarai, the promoted argument is the a-object, not the a-subject due to a different voice system. Consider:

(36) a. Kopong genatu doi nei go'e (Lamaholot)
name send money give 1SG SUBJ *(AV monotransitive)*
'Kopong sent money to/for me' <'Kopong','money'>(<'1SG'>)

b. **Doi ne** Kopong genatu-**ro** nei go'e *(OV monotransitive)*
money that name send-OV.3SG give 1SG SUBJ
'The money was sent by Kopong to me' <'Kopong','money'>(<'1SG'>)

c.?* Kopong genatu go'e doi *(*AV ditransitive)*
name send 1SG money ?* SUBJ
'Kopong sent me money' <'Kopong','1SG','money'>

d. **Go'e** Kopong genatu-**k** doi *(OV ditransitive)*
1SG name send-OV.1SG money SUBJ
'I was sent money by Kopong' <'Kopong','1SG','money'>

e. *Doi ne Kopong genatu-**ro** go'e *(*OV ditransitive)*
money that name send-OV.3SG 1SG SUBJ
'The money was sent (to) me by Kopong' * <'Kopong','1SG','money'>

The verb *genatu* 'make' is basically a monotransitive verb with the following entry (the Benefactive is arguably not an argument):

(37) *genatu* 'make' < __ , __ >

(Agent, Patient)

Given (i) the information of the entry (37) and (ii) that the language has a symmetrical voice system without PASS (i.e. not demotion of Agent to non-core status is possible), then the AV/OV alternation involving the monotransitive verb is straightforward. In case, a new argument is introduced and promoted, in this case the Benefactive, ranking competition arises. Crucially, the promotion must be licensed. If no pragmatic prominence associated with the Benefactive, then there is no promotion. The default mapping yielding AV monotransitive of the type (36a) is imposed. This explains why the AV ditransitive with Benefactive core (36c) is not acceptable. On the contrary, assigning pragmatic prominence to the Benefactive licenses its promotion, crucially, to SUBJ, by which it can appear sentence initially. However, since it is thematically lower than the Agent and it is higher than the Theme, it occupies the second position in the ranking of the a-str. (The Agent cannot be demoted because this is not available in the grammar.) This explains why such interaction gives rise to a ditransitive a-str (i.e. with three cores) this must be in OV. That is, the OV is the mapping of the a-object onto SUBJ. Finally, the badness of (36e) can be accounted for in the same way as the badness of (36c), where nothing licenses the promotion of the Benefactive; or else, it might suggest that this language might impose AOP. Further examination is needed for a predicate that is truly ditransitive.

Now, let us have further examination of the interaction of voice system and double object constraints.

Languages that impose no AOP are expected to have no problem in non-active voice alternations. In particular, there can be two possible non-active constructions associated with a ditransitive base. This is the case in Balinese (38) and Sikka (39). The (b) sentences show the OV verbs with Benefactive-SUBJ and the (c) sentences show the other alternative OV verbs with Theme-SUBJ.

(38) a. Ia meli-ang Nyoman umah (Balinese)
3 AV.buy-APPL name house
'(S)he bought a house for Nyoman'

b. Nyoman beli-ang=a umah
name OV.buy-APPL=3 house
'For Nyoman, (s)he bought a house'

c. Umah ene ane beliang=a Nyoman
house this REL OV.buy=3 name
'It is this house that (s)he bought for Nyoman'

(39) a. Ina piar `ami adang ganu te'i (AV) (Sikka)
mother present 1PL sign like this
'Mother presented this gift to us'

b. `Ami ina piar adang ganu te'i (OV)
1PL mother present sign like this
'We were presented with this gift by mother'

c. Adang ganu te'i ina piar `ami (OV)
sign like this mother present 1PL
'This gift was presented to me by Mother'

Languages that impose AOP, however, are predicted to be restricted in the possible non-active voices. Standard Indonesian, for instance, is a language of this type. Due to the AOP, which prohibits the lowest core of a ditransitive verb (i.e. the second a-object of the two a-objects) to be SUBJ, this language has a problem with the non-active ditransitive verb where the Theme is SUBJ, e.g., with the OV applicative verb *belikan* (40c). In the non-applicative OV verb, *beli*, it is expected to be fine (40d). This is because *beli* is monotransitive, wherein the Theme is the only a-object in the a-str. Therefore, it is not subject to the AOP: it can be the SUBJ of the OV verb.

(40) a. Saya mem-beli-kan Amir baju baru (Amir=Ben OBJ)
1SG AV-buy-APPL name shirt new (Indonesian)
'I bought a new shirt for Amir'

b. Amir saya beli-kan baju baru (Amir=Ben SUB)
name 1SG OV.buy-APPL shirt new
'For Amir, I bought a new shirt'

c.?* Baju baru (itu) saya beli-kan Amir (Baju baru=Th SUBJ)
shirt new that 1SG OV.buy-APPL name
'The new shirt, I bought it for Amir'

d. Baju baru itu saya beli untuk Amir
shirt new that 1SG OV.buy for name
'The new shirt, I bought it for Amir'

Likewise, passivizing theme-SUBJ (with the verb *dibelikan*) (41a) is a problem. To be acceptable, the verb must be monotransitive (i.e. without the applicative suffix *–kan*), where the Benefactive is not a core argument (41b). The explanation for this contrast is in principle the same as that for (40), except for the difference of the core status of the theme in (41b). Being the only a-object of *beli*, the Theme in (41b) can easily assume the a-subject status in PASS, kicking out the Agent to non-core status.

(41) a.?*Bajubaru itu di-beli-kan Amir oleh Tono (Indonesian)
shirt new that PASS-buy name by name
'The new shirt was bought for Amir by Tono'

b. Baju baru itu di-beli untuk Amir oleh Tono
shirt new that PASS-buy for name by name
'The new shirt was bought for Amir by Tono'

Bima imposes AOP; therefore it is expected that it shows a similar restriction to Indonesian. This is confirmed. There is a (surprising) difference, however. Unlike that in Indonesian (41b), passivising Theme-SUBJ in Manggarai is still allowed with the applicative verb, with the consequence that the applied argument is obligatorily present as non-core (OBL). This is, in fact, something expected in the present analysis. Consider (42):

(42) a. Sia ndawi-wea-na nahu kuru nasi (active)(Bima)
3SG make-APPL-3.REAL 1SG cage bird
'(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
'For me, the bird cage was made by him/her'

c. * 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'

d. 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'

(42a) shows the ditransitive applicative verb, with the applied Benefactive argument `nahu` being the first a-obj/OBJ and *kuru nasi* as the second a-obj/OBJ. Given this picture, it is predicted that *nahu* can be SUBJ of the passive verb in (42b). Likewise, given the AOP in Bima, passivizing theme-SUBJ is predictably not allowed (42c). In contrast to (42c), and unlike Indonesian (42b), passivizing theme-SUBJ in Bima is possible with the applicative verb (42d) (marked with *wea*). Note that in this structure, the Benefactive argument is non-core, marked by *ruu*. The effect of this marking is that the OBL benefactive *ruu nahu* is obligatorily present. (If the applicative suffix *wea* is absent, the presence of the Benefactive OBL *ruu nahu* is optional.)

The a-str based analysis predicts that the pattern observed in (42) is expected. The default a-str of 'make' is monotransitive, where the benefactive role is not core (possibly an oblique or adjunct, intrinsically optional) (43a). The applicative *wea* introduces the Benefative to the a-str of *nadwi* as a core argument, as generally it is in other languages. This gives rise to a ditransitive structure (43b), where in accordance to the thematic ranking of the a-str, the applied Benefactive is the first a-object. In the default mapping, this gives rise to an unmarked reading, an active voice structure of (40a).

(43) a. ndawi 'make' < <__,__>(<_>)>

(Agt) (Th) (Ben)

b. ndawi-wea ‘make-for’ < __ , __ , __>

(Agt) (Ben) (Th)

c. ndawi-wea ‘make-for’ << __ , __ ><__>>

(Agt) (Th) (Ben)

A marked mapping is, however, possible by means of passivization. Given the a-str property in (43b), and since Bima has an asymmetrical voice system (where only a-subject can be SUBJ), only the applied Benefactive argument can assume the a-subject when the Agent is backgrounded from this a-subject position. This accounts for the acceptability of the passive verb with Benefactive-SUBJ (42b). The theme-core argument, being the third in rank, cannot be the first when the Agent is demoted. Thus, mapping it onto SUBJ violates the asymmetrical voice system constraint in this language. This accounts for the unacceptability of (42c).

When for some reason the Benefactive is still made part of the a-str (thus applicativization with *wea* is necessary) but for some other reason (possibly pragmatic/syntactic), the Theme is also highlighted, then there is a problem. There is a competition for a-subj/SUBJ mapping and potential violation of asymmetrical voice constraint, and argument ranking in the a-str. The conflict is resolved by rearranging the a-str ranking as shown by (43c). The a-str in (43c) appears to be the same as that in (43a), except for the clear status of the Ben, which is now an obligatorily present non-core/OBL. Note that, in (43c), the Benefactive argument is treated as a non-core, paving the way for the Theme being the only a-object. Therefore, it can assume the a-subject status in the passive construction. In short, the proposed analysis accounts for the fact that applicativization nay result in an a-str where the applied argument is not a core argument.

Table 4 gives a summary of the (a)symmetricality in voice system and possible object doubling in Indonesian languages. A language that has asymmetrical voice system with symmetrical double objects (row 4) arguably does not exist because the two are contradictory to each other. The asymmetrical voice system prohibits a non-a-subject to be SUBJ whereas the symmetrical object system allows a non-a-subject to be SUBJ. Thus, both cannot be part of the same grammar. While Manggarai appears to have no ditransitive with asymmetrical system, none of the languages discussed here are of the type shown in row 6. More research is needed to reveal whether there is a language in this area that has this system.

Table 4
Voice Systems and Object Doubling in Indonesian Languages

	Voice system	Object doubling	Languages
1.	symmetrical	symmetrical	Balinese, Lio, Sikka
2.	symmetrical	asymmetrical	Indonesian, Lamaholot (?)
3.	asymmetrical	asymmetrical	Bima
4.	asymmetrical	symmetrical	(predicted not available)
6.	asymmetrical	-	Manggarai
7.	symmetrical	??	??

3.2 Being Core: evidence from Binding:

The significance of being core comes from binding. I argue that languages languages differ with respect to which structural prominence is relevant for binding (Arka 1998; Bresnan to appear; Dalrymple 1993; Manning 1996; Wechsler and Arka 1998). In what follows, I contrast Balinese/Indonesian, where binding is sensitive to the a-str, and Manggarai/Lamaholot, where binding is sensitive to the surface grammatical relation (f-str). The expected pattern of contrast is that in Balinese/Indonesian binding is not affected by voice change so long that the core prominence is unaffected by voice alternation. In Manggarai/Lamaholot, binding will be affected by voice alternation, even though core prominence remains the same. This is what we see.

First, consider Indonesian and Balinese data in (41)-(42). AV/OV alternations do not change binding relations (Arka 1998; Arka and Manning to appear; Wechsler and Arka 1998). Crucially, in the OV constructions (i.e., the (b) sentences below), the non-subject arguments can bind the SUBJ reflexives. In the a-str based analysis presented here, this follows from the idea that binding in these languages is sensitive to the a-str prominence: the Agent binder is the a-subject, the most prominent item, in the a-str, even though it is not grammatically SUBJ on the surface syntax.

(44) a. Dia tak meng-hiraukan diri-nya (AV) (Indonesian)
3SG NEG AV-care self-3
'(S)he didn't care with himself/herself'

b. Dirinya tak dia hiraukan (OV)
self-3 NEG 3SG OV.care
'Himself/herself, (s)he didn't care (with)'

(45) a. Ia tusing ng-runguang awak-ne (AV) (Balinese)
3 NEG AV-care self-3
'(S)he didn't care with himself/herself'

b. Awak-ne tusing runguang=a (OV)
self-3 NEG OV.care=3
'Himself/herself, (s)he didn't care (with)'

In Lamaholot, as demonstrated by the contrast in (46), a change to OV results in the inability of the Agent to bind the SUBJ reflexive. This suggests that binding in Lamaholot, unlike that in Balinese and Indonesian, is sensitive to surface grammatical relation.

(46) a. Na' tubi' weki-n (AV) (Lamaholot)
3SG pinch.AV self-3
'(S)he pinched himself/herself'

b.?* Weki-n na' tubi-ro' (OV)
self-3 3SG pich-OV.3SG
'Himself/herself, (s)he pinched'

Likewise, Manggarai binding appears to be sensitive to surface grammatical relation. (47a) shows an active sentence where the OBJ is bound by SUBJ, which is straightforward. (47b) shows the passive counterpart of (47a), where the pronominal *hia* is now an OBL marked by *le* 'by'. As a result, *hia* can no longer bind the reflexive *ru-n* 'self-3' (reading (ii)). This sentence is acceptable only on reading (i), where *ru-n* is interpreted as an emphatic reflexive associated with the subject *weki* referring to someone else (index *j*). Surprisingly, Manggarai has the passive shown in (47c), where the Agent itself is a reflexive (*ru-n*) bound by the Theme-SUBJ (*hia/wekin*).

(47) a. Hia$_i$ mbele weki ru-n$_i$ <hia$_i$, self$_i$> (AV) (Manggarai)
3SG kill body self-3
'S/he killed himself/herself'

b. Weki ru-n$_i$ mbele le hia$_{*i/j}$ << self$_i$><hia$_{j/*i}$>> (PASS.)
body self-3 kill by 3
(i) '(S)he$_i$ (himself/ herself) was killed by him$_j$ /her$_j$'
(ii) *'(S)he was killed by himself/herself'

c. Hia$_i$/weki-n$_i$ mbele le ru-n$_i$ <<hia$_i$><self$_i$>> (PASS.)
body-3 kill by self-3
'S/he was killed by himself/herself'

Not many languages perhaps allow binding of an Agent reflexive in an independent clause like Manggarai (47c) where the Agent is syntactically an OBL, ranked lower than SUBJ. Indonesian and Balinese do not generally allow this, as shown by the badness of the (d) sentences in (48)-(50):

(48) a. Dia bisa melihat diri-nya (AV) (Indonesian)
3SG can AV-see self-3
'(S)he can see himself/herself'

b. Diri-nya bisa dia lihat (OV)
self-3 can 3SG OV.see
'Himself/herself, (s)he can see'

c. ??Dirinya bisa di-lihat oleh dia (PASS.)
self-3 can PASS-see by 3SG
'Himself/herself can be seen by him/her'

d. *Dia bisa dilihat oleh dirinya (PASS)
3SG can PASS-see by self-3
'(S)he can be seen by himself/herself'

(49) a. Ida tan sida nyingakin ragan-idane (AV) (Balinese) (h.r.)
3 NEG can AV-see self-3
'(S)he cannot see himself/herself'

b. Raganidane tan sida cingakin ida (OV)
self-3 NEG can OV.see 3
'Himself/herself, (s)he cannot see'

c. ??Raganidane tan sida ka-cingakin antuk ida (PASS)
self-3 NEG can PASS-see by 3
'Himself/herself cannot be seen by him/her'

d.?* Ida tan sida kacingakin antuk raganidane (PASS)
3 NEG can PASS-see by self-3
'(S)he cannot be seen by himself/herself'

(50) a. Ia ningalin awakne (AV) (Balinese)
3 AV.see self-3
'(S)he saw himself/herself'

b. Awakne tingalin=a (OV)
self-3 OV.see=3
'Himself/herself, (s)he saw'

c. ??Awakne tingalin-a teken ia (PASS)
self-3 see-PASS by 3
'Himself/herself was seen by him/her'

d.* Ia tingalin-a teken awakne (PASS)
3 see-PASS by self-3
'(S)he was seen by himself/herself'

The acceptability of the (a)-(b) sentences has been discussed before and is not repeated here. The relatively bad (c) sentences are certainly due to the violation of the a-str-based constraint of binding: the binder is non-core, ranked lower than the bindee, which is core. Surprisingly, the (d) sentences are even worse than the (c) sentences, even though the a-str based constraint is respected. Thus, binding in Balinese and Indonesian is not completely subject to syntactic constraint. The fact that the same binding relation is possible in Manggarai suggests that binding in Manggarai binding is completely sensitive to the surface syntactic prominence constraint. Since OBL is grammatically lower than SUBJ, then, in theory, reflexive OBL can be bound by SUBJ, even though the OBL is the logical subject/Agent.

On the contrary, the badness of the (d) in Balinese and Indonesian shows that binding in these languages is not completely sensitive to syntactic prominence. It may be also sensitive to semantic prominence: the logical subject/Agent cannot be bound. Among the languages discussed here, none shows the property that binding is exclusively sensitive to semantic prominence.

4 Conclusion

1. Being core is a complex matter, involving interaction of morphosyntax-semantics and, crucially, pragmatic prominence.
2. A default core status of an argument is determined in a lexical entry of a predicate. A change of the core status may be determined (i) morpholexically and/or (ii) analytically/syntactically; in either case, it is possibly motivated/imposed by pragmatics. The change may involve a decrease or an increase in the number of core argument, or simply a change in mapping without affecting the number of core arguments. The change is associated with a change in voice, which may or may be morphologically marked.
3. Possible argument promotion is typologically predictable, based on two parameters of symmetricality in:
   (a) voice system: symmetrical vs asymmetrical voice system
   (b) object doubling: symmetrical vs asymmetrical Objects.
4. The notion of prominence across structural layers which interacts with the specific setting of the parameters stated in (3) is crucial for possible mapping and voice selection.
5. The analysis offered here accounts for (i) typological variations of voice selection and (ii) possible restrictions that they may impose in core promotion and mapping onto SUBJ. In particular, it is expected that promotion can be directly to a-subj/SUBJ, hence it is possible that (i) passivisation may involve no OBJ-SUBJ alternation (i.e. the active counterpart where the same semantic role appearing as OBJ does not exist), (ii) passivization may not be a transitivity decreasing process.

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