

Analysis of Indonesian Passives in HPSG and Its Implementation in INDRA

David **Moeljadi**

Division of Linguistics and Multilingual Studies,
Nanyang Technological University, Singapore

The Twenty-Second International Symposium On Malay/Indonesian Linguistics (ISMIL 22),
University of California, Los Angeles, USA

11 May 2018



Aim of this study and its limitations

- Standard, formal Indonesian
- Passive type 1 (P1) and type 2 (P2) [5], [8]
P1: NP_{Theme/Patient} + di-V + NP_{Agent}
P2: NP_{Theme/Patient} + NP_{Agent} + bare V
- Monotransitive only (ditransitive will not be discussed)
- computationally implementable
 - ▶ Head Driven Phrase Structure Grammar (HPSG) [7]
 - ▶ Minimal Recursion Semantics (MRS) [4]
 - ▶ Indonesian Resource Grammar (INDRA) [6]

“To analyze and develop a detailed model (rules) of standard, formal Indonesian passive type 1 and type 2 (syntax and semantics) explicit enough to be interpreted by a computer”

...especially how to deal with bound forms *ku-*, *kau-*, and *-nya*, NP and VP coordination

Sentences not to be discussed

- Saya dibelikan baju oleh Amir. (ditransitive)
- Mencari kerja di kota sudah dicoba oleh Amir. (VP->NP Subject)
- Mobil itu sudah dicoba diperbaiki oleh Amir. (control construction)
- Dipandangnya wajah Peggy. (word order)
- Obat itu termakan oleh anak itu. (ter-)
- Saya kecurian mobil. (ke...-an)

Indonesian passives type 1 and type 2

- Two passive constructions: [5] [8] [2] [3]
 - ① Passive Type 1 (P1) / Canonical passive
 - ② Passive Type 2 (P2) / Object preposing passive / Pasif semu
- P1 and P2 are in (near) complementary distribution
 - ▶ P1: 3 agents (both pronouns and nouns)
 - ▶ P2: 1 and 2 agents *or* pronouns (including 3 agent, also pronoun substitutes, including proper nouns)
 - ▶ P1 and P2 overlap with respect to 3 agent
- Syntax
 - ▶ Word order: patient/undergoer in active → passive subject
 - ▶ Lexical process: transitive verb → intransitive verb (formally marked)
- Semantics
 - ▶ Semantically transitive clause
 - ▶ The promoted arguments are *focus-or-topic*, the demoted arguments are *non-topic*
 - ▶ The semantic roles of the arguments in active and its passive counterpart are the same

Passive Type 1

$NP_{\text{Theme/Patient}} + \text{Neg/Aux} + \text{di-V} + NP_{\text{Agent}}$

- *di-* is prefixed to the verb, phonologically and orthographically part of the verb, always immediately to its left
- NP agent
 - ▶ follows the verb (post-verbal)
 - ▶ demoted to adjunct, optional
 - ▶ can be preceded by a semantically empty preposition (it needs a preposition when it is not adjacent to the verb or when there are intervening elements)
 - ▶ with 3SG agent, the bound form *-nya* may occur
- auxiliaries and negation precede the passive *di-* verb

Passive Type 2

$NP_{\text{Theme/Patient}} + \text{Neg/Aux} + NP_{\text{Agent}} + \text{bare V}$

- the verb appears in bare stem form
- NP agent
 - ▶ precedes the verb (pre-verbal)
 - ▶ not demoted to adjunct, obligatory, an argument [1]
 - ▶ cannot be preceded by any prepositions, nothing can intervene the NP agent and the bare verb
 - ▶ with 1SG and 2SG agents, the bound form *ku-* and *kau-* may occur
- auxiliaries and negation precede the agent (cannot come between the agent and the bare verb)

Passive type 1

- (1) a. *Budi sudah dijemput.*
Budi PRF PASS-pick.up
“Budi has been picked up.”
- b. *Budi sudah dijemput dia.*
Budi PRF PASS-pick.up 3SG
“Budi has been picked up by him.”
- c. *Budi sudah dijemputnya.*
Budi PRF PASS-pick.up=3SG
- d. *Budi sudah dijemput (oleh) mereka/istrinya/Adi.*
Budi PRF PASS-pick.up by 3PL/wife=3SG/Adi
- e. *Budi sudah dijemput olehnya.*
Budi PRF PASS-pick.up by=3SG

Passive type 1

- (2) a. *Budi sudah dijemput (oleh) dia kemarin.*
Budi PRF PASS-pick.up by 3SG yesterday
- b. *Budi sudah dijemput kemarin oleh dia.*
- c. **Budi sudah dijemput kemarin dia.*

Passive type 1 with coordination

- (3) a. *Budi sudah dijemput (oleh) Adi dan Ani.*
Budi PRF PASS-pick.up by Adi and Ani
“Budi has been picked up by Adi and Ani.”
- b. **Budi sudah dijemputnya dan Ani.*
Budi PRF PASS-pick.up=3SG and Ani
- c. **Budi sudah dijemput olehnya dan Ani.*
- d. *Budi sudah dijemput dan disuntik (oleh) Adi.*
Budi PRF PASS-pick.up and PASS-inject by Adi
“Budi has been picked up and injected by Adi.”
- e. *Budi sudah dijemput dan disuntiknya.*
- f. *Budi sudah dijemput oleh Adi dan disuntik Ani.*

Passive type 2

- (4) a. *Budi sudah dia jemput.*
Budi PRF 3SG pick.up
“Budi has been picked up by him.”
- b. *Budi sudah aku/saya jemput.*
Budi PRF 1SG pick.up
- c. *Budi sudah kamu/Anda jemput.*
Budi PRF 2SG pick.up
- d. *Budi sudah mereka jemput.*
Budi PRF 3PL pick.up
- e. *Budi sudah kami jemput.*
Budi PRF 1PL.EXCL pick.up
- f. *Budi sudah kalian jemput.*
Budi PRF 2PL pick.up

Passive type 2

- (5) a. *Budi sudah bapak jemput.*
Budi PRF father pick.up
“I/You (father/old man) have met Budi.” (lit. “Budi has been picked up by me/you (father/old man).”)
- b. *Budi sudah Adi jemput.*
Budi PRF Adi pick.up
“I/You (Adi) have met Budi.” (lit. “Budi has been picked up by me/you (Adi).”)
- (6) a. *Budi sudah kujemput.*
Budi PRF 1SG-pick.up
“I have met Budi.” (lit. “Budi has been picked up by me.”)
- b. *Budi sudah kaujemput.*
Budi PRF 2SG-pick.up

Passive type 2 with coordination

It is impossible to coordinate two pronouns as actors or two verbs with a single actor (Musgrave 2001)

- (7) a. ?*Budi sudah kami dan mereka jemput.*
Budi PRF 1PL.EXCL and 3PL pick.up
“Budi has been picked up by us and them.”
- b. ?*Budi sudah dia tunggu dan jemput.*
“Budi has been waited and picked up by him.”
- c. ??*Budi sudah kutunggu dan jemput.*
- d. *Budi sudah kutunggu dan kujemput.*
- e. *Budi sudah kutunggu dan kaujemput.*
“Budi has been waited by me and picked up by you.”

Bound forms *ku-*, *kau-*, *-nya*

Clitics vs inflectional affixes (Zwicky & Pullum 1983) [9]

- clitics can attach to words of any category (or part-of-speech), while the inflectional affixes are quite specific in their selections of stems
- no syntactic operations exist which treat a word combined with clitics as a unit, while words with inflectional affixes are treated as units

ku- “1SG” and *kau-* “2SG” are inflectional affixes, *-nya* “3SG” is a clitic

- *-nya*
 - ▶ treated as a word (tokenized)
- *ku-* and *kau-*
 - ▶ treated as prefixes (not tokenized)
 - ▶ the relationship of the agent and the verb is morphological rather than syntactic

NP coordination rule: cannot take bound forms *-nya*, *ku-*, *kau-*, also *-ku* and *-mu*

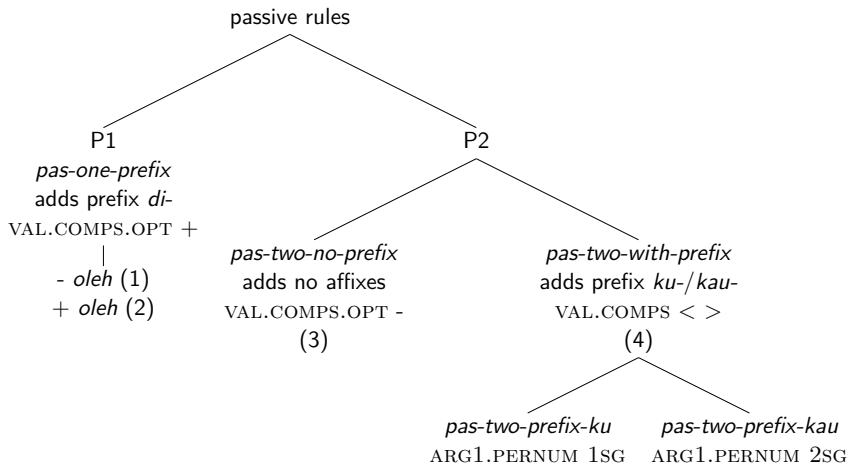
Passive as an inflectional rule

(8)

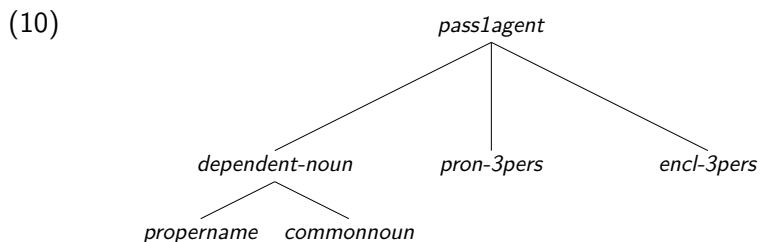
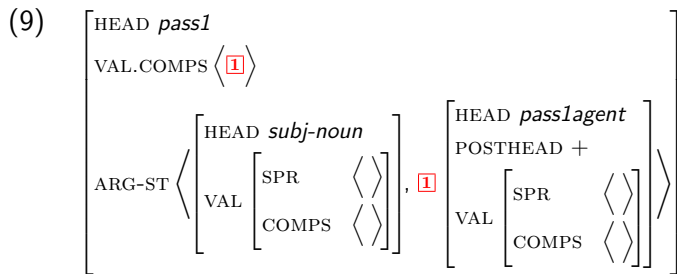
$$\begin{array}{l}
 \text{INPUT} \left\langle X, \left[\begin{array}{l} \text{lexeme (tr-verb-lex)} \\ \text{ARG-ST} \left\langle \left[\dots \right], \left[\dots \right] \right\rangle \right] \right\rangle \\
 \\
 \text{OUTPUT} \left\langle (\text{di-})X, \left[\begin{array}{l} \text{word (passive-transitive-lex-item)} \\ \text{ARG-ST} \left\langle \left[\begin{array}{l} \text{INDEX} \quad \boxed{1} \\ \text{ICONS-KEY} \quad \boxed{3} \end{array} \right], \left[\begin{array}{l} \text{INDEX} \quad \boxed{2} \\ \text{ICONS-KEY} \quad \boxed{4} \end{array} \right] \right\rangle \\ \text{LKEYS.KEYREL} \left[\begin{array}{l} \text{ARG1} \quad \boxed{2} \\ \text{ARG2} \quad \boxed{1} \end{array} \right] \\ \text{ICONS} \left\langle ! \quad \boxed{3} \left[\begin{array}{l} \text{focus-or-topic} \\ \text{IARG2} \quad \boxed{1} \end{array} \right], \quad \boxed{4} \left[\begin{array}{l} \text{non-topic} \\ \text{IARG2} \quad \boxed{2} \end{array} \right] ! \right\rangle \right] \right\rangle
 \end{array}
 \right.
 \end{array}$$

i-rule :

Indonesian passive lexical rules

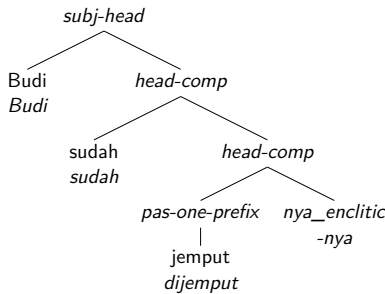
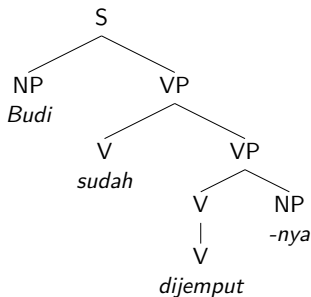


(1) P1 without *oleh*

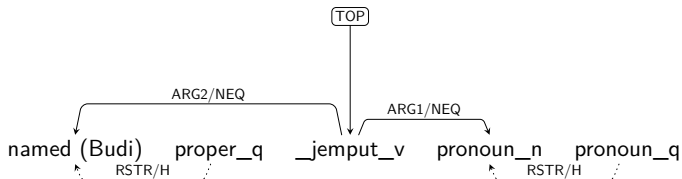


(1) P1 without *oleh* (tree and DMRS)

(11)



(12)

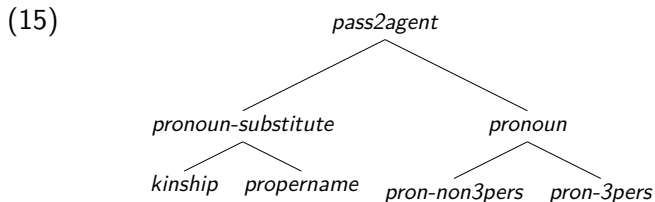
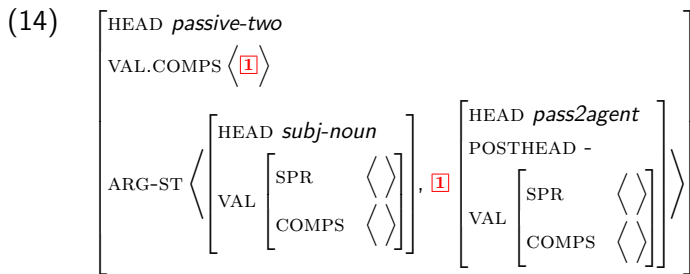


(2) P1 with *oleh*

$$(13) \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \textit{oleh-adp} \\ \text{MOD} \mid \text{LOC} \mid \text{CAT} \left[\begin{array}{l} \text{HEAD} \quad \textit{pass1} \\ \text{VAL} \mid \text{COMPS} \langle \mathbf{1} \rangle \end{array} \right] \end{array} \right] \\ \text{VAL} \mid \text{COMPS} \langle \mathbf{1} \rangle \end{array} \right]$$

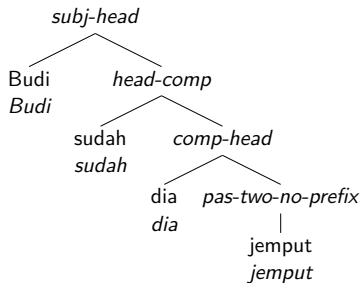
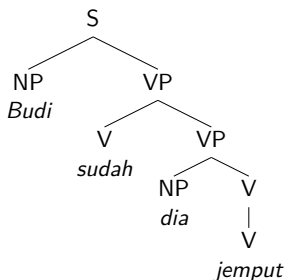
- *oleh* adds nothing to the meaning except the information that the COMPS of the passive verb is coindexed with the COMPS of *oleh*
- The semantics of the PP headed by *oleh* is identical to the semantics of *oleh*'s NP complement

(3) P2 without bound forms

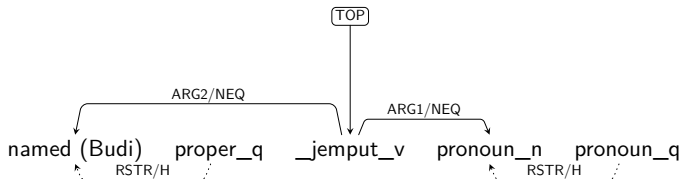


(3) P2 without bound forms (tree and DMRS)

(16)

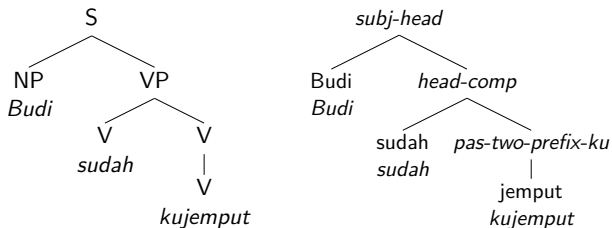


(17)

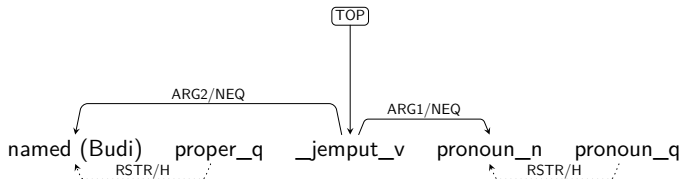


(4) P2 with bound forms (tree and DMRS)

(18)



(19)



Summary and conclusions

- Bound forms *-nya*, *ku-*, *kau-*: clitics vs affixes
- P1 and P2: 4 rules
- NP coordination rule
- *oleh* “by” as an adjunct
- Future work: evaluation

Thank you

Terima kasih

References I

- I Wayan Arka, Christoffer Manning, et al. *Voice and grammatical relations in Indonesian: A new perspective*. Citeseer, 1998.
- Sandra Chung. “On the subject of two passives in Indonesian”. In: *Subject and topic* 57 (1976), p. 99.
- Peter Cole, Gabriella Hermon, and Yassir Tjung. “Is there pasif semu in Jakarta Indonesian?” In: *Oceanic Linguistics* 45.1 (2006), pp. 64–90.
- Ann Copestake et al. “Minimal Recursion Semantics: An Introduction”. In: *Research on Language and Computation* 3.4 (2005), pp. 281–332.
- Soenjono Dardjowidjojo. *Sentence patterns of Indonesian*. University of Hawaii Press, 1978.
- David Moeljadi, Francis Bond, and Sanghoun Song. “Building an HPSG-based Indonesian Resource Grammar (INDRA)”. In: *Proceedings of the GEAF Workshop, ACL 2015*. 2015, pp. 9–16. URL: <http://aclweb.org/anthology/W/W15/W15-3302.pdf>.

References II

Ivan A. Sag, Thomas Wasow, and Emily M. Bender. *Syntactic Theory: A Formal Introduction*. 2nd ed. Stanford: CSLI Publications, 2003.

James Neil Sneddon et al. *Indonesian Reference Grammar*. 2nd ed. New South Wales: Allen & Unwin, 2010.

Arnold M. Zwicky and Geoffrey K. Pullum. “Cliticization vs. Inflection: English N'T”. In: *Language* 59.3 (Sept. 1983), pp. 502–513.