

Middle voice as generalized argument suppression: the case from Indonesian
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1 Introduction

- “Middle voice verbs” (hence “middles”) have many perplexing properties that have generated much research on the nature of word meaning and its relationship to morphosyntax.
- Middles form well-defined semantic classes, including reflexive verbs such as those of bodily care (e.g. ‘wash’) (Kemmer 1993), “middle constructions” (Condoravdi 1989, Fagan 1992, Ackema and Schoorlemmer 1994, 1995, 2005, *inter alia*) and anticausatives (Chierchia 2004, Koontz-Garboden 2009, Beavers and Zubair 2013), illustrated for Spanish in (1).

- (1) a. *Juan se afeitó.*
Juan REFL shaved
‘Juan shaved (himself).’ (reflexive of transitive *afeitar*)
- b. *Se vende zapatos rápidamente.*
REFL sell shoes quickly
‘Shoes sell quickly.’ (middle construction (MC) of transitive *vender*)
- c. *El vaso se rompió.*
the vase REFL broke
‘The vase broke.’ (anticausative of transitive *romper*)

- One approach has focused on the syntactic unity of middles as detransitivization (Grimshaw 1982, Keyser and Roeper 1984, Ackema and Schoorlemmer 1994, 1995, Doron 2003, Reinhart and Siloni 2005, Alexiadou et al. 2006, Alexiadou 2010, Alexiadou and Doron 2012):
- However, while it is possible to have a unified theory — subject elimination plus object promotion (Embick 2004) — there’s quite a bit of debate:
 - Anticausatives are almost universally taken to be unaccusative (Burzio 1986).
 - Reflexives might be unaccusative (Embick 2004), unergative (Reinhart and Siloni 2005), or vary (Alexiadou and Schäfer 2014)
 - MCs are probably unaccusative (Keyser and Roeper 1984, Stroik 1992), maybe unergative (Ackema and Schoorlemmer 1995), or vary (Ackema and Schoorlemmer 2005).
- Some thus call middles notional categories (Condoravdi 1989, Lekakou 2002, Fábregas and Putnam 2014) or a family of constructions (Reinhart 2002, Alexiadou and Doron 2012).
- Kemmer offers a rare attempt at a unified semantics. The core is “low distinguishability of participants” (reflexivization), which she later generalizes to “low elaboration of events” — separate subevents or participants are not differentiated — to cover MCs and anticausatives.
- Unfortunately, this notion is left vague and it is unclear how to test for it, nor what types of “low elaboration” constitute the meaning of middle forms in particular.
- I suggest a unified analysis of middles in at least one language, namely Indonesian (Kemmer 1993, Kardana 2011), where *ber-* middles mark a mismatch between the verb’s syntax and semantics (building on Kaufmann 2007, Beavers and Zubair 2013, Spathas et al. 2015).

- While the base verb is dyadic, the resulting *ber-* form expresses just one of its arguments — crucially either one, depending on syntactic properties — leaving the other suppressed in the verb’s meaning, albeit still there truth conditionally.
- This underlying argument needs to be interpreted and/or expressed, and different types of middles arise from language-specific and universal strategies for doing this, in conjunction with additional pragmatic, lexical semantic, and structural constraints.

Middle is not (always) notional or a family of constructions, but can have a unified analysis marking a mismatch between the verb’s semantic content and combinatoric properties.

- I first outline four primary *ber-* middles and offer a tentative analysis, extending this to other cases, including reciprocals. I offer two brief caveats about the data and scope of the study.
 - The verb classes that allow different sorts of middles are usually semantically limited; some of this will emerge below but there are additional constraints I do not discuss.
 - Middle formation is not productive; I assume it is lexicalized, but principled.
- Thus I treat *ber-* forms as lexicalized, albeit with significant underlying generalizations.

2 Middle Voice in Indonesian — Verbal Roots

- Indonesian is typically SVO and shows nominative/accusative syntax (but no overt case). The *ber-* form fits into a larger paradigm of active and non-active voice in Indonesian:

- | | | | | |
|-----|----|---|----|---|
| (2) | a. | <i>Tono men-dandan Ali.</i>
Tono AV-dress Ali
‘Tono dressed Ali.’ (agent voice) | b. | <i>Ali Tono dandan.</i>
Ali Tono OV.dress
‘Tono dressed Ali.’ (object voice) |
| (3) | a. | <i>Ali di-dandan (oleh Tono).</i>
Ali PASS-dress by Tono
‘Ali was dressed by Tono.’ (passive) | b. | <i>Ali ber-dandan (*oleh Tono).</i>
Ali MV-dress by Tono
‘Ali dressed (himself).’ (middle) |

2.1 Middle Constructions

- Middle constructions occur primarily with change-of-state verbs as in (4). The subject DP is equivalent to the object of the corresponding transitive (plus often a modal or generic semantics and a “responsibility” reading; Condoravdi 1989, Fagan 1992, Lekakou 2002):

- | | | | |
|-----|---------------------|-------------------------|-------------------------|
| (4) | Root | <i>meN-</i> form | <i>ber-</i> form |
| | <i>masak</i> ‘cook’ | <i>me-masak</i> | <i>ber-masak</i> |
| | <i>jual</i> ‘sell’ | <i>men-jual</i> | <i>ber-jual</i> |
| | <i>tambat</i> ‘tie’ | <i>men-(t)ambat</i> | <i>ber-tambat</i> |

- | | | | |
|-----|----|---|--------------------|
| (5) | a. | <i>Dia men-jual mobil itu.</i>
3SG AV-sell car that
‘(S)he sold the car’ | |
| | b. | <i>Mobil itu ber-jual (kemarin/dengan mudah).</i>
car that MV-sell yesterday/with easy
‘The car sold (yesterday)/sells (easily)’ | (episodic/generic) |

- The two participants of the transitive base are still both entailed to exist in the *ber-* form, exactly as is typically found in a passive, but not like an anticausative:

- (6) a. #*Mobil itu ber-jual/di-jual tapi tidak ada orang yang men-jual=nya.*
 car that MV-sell/PASS-sell but NEG exist man REL AV-sell=3SG
 #‘The car (was) sold, but nobody sold it.’
 b. *Pasukan itu ter-(p)ecah dua tapi tidak ada yang mem-ecah=nya.*
 troop that INC-break two but NEG exist REL AV-break=3SG
 ‘The troop broke into two but nobody broke them.’ (On intended reading)

- Thus they are like passives, but unlike passives (and like inchoatives), *ber-* forms resists purposives (Levin and Rappaport Hovav 1995: 109) (and *oleh* ‘by’ PPs; see (3)):

- (7) [*Orang itu*]_i *di-jual/*ber-jual* [*PRO*]_{j/*i} *untuk men-erima komisi 10%*.
 man that PASS-sell/MV-sell to AV-receive commission 10%
 ‘The man *(was) sold to receive a 10% commission.’ (e.g. sold into slavery)

Middle constructions require two participants semantically, but only the patient surfaces syntactically. They are not anticausative nor passive by standard diagnostics.

2.2 Incorporated Object Middles

- Many of the same *ber-* forms have an alternative use wherein the subject corresponds instead to the subject of the *meN-* form, and the object is an obligatory incorporated NP.

- (8) *Orang itu ber-cuci=mata/kakimuka/mulut/rambut/baju/ikan/pisang.*
 man that MV-wash=eye/foot/face/mouth/hair/dress/fish/banana
 ‘The man washed his foot/eye/face/hair/dress/fish/banana.’

- Semantically, the The NP also shows number neutrality and discourse opacity, suggesting incorporation. Grammatically, the N cannot be separated from the V:

- (9) *Gadis itu men-cuci dengan cepat kaki=nya/*ber-cuci dengan cepat kaki.*
 girl that AV-wash with quick leg=3SG.POSS/MV-wash with quick leg
 ‘The girl washed her leg quickly’

- Adjectives and relative clauses *are* possible, suggesting that the incorporation is syntactic, but it cannot take determiners or possessor clitics (though there may be cross-speaker variation; see Fortin and Soh 2014), altogether suggesting NP not DP incorporation:

- (10) *Gadis itu ber-cuci=sayur (yang) hijau (*itu/=nya).*
 girl that MV-wash=vegetable REL green that/3SG.POSS.
 ‘The girl washed her green vegetables/her vegetables which are green’

- Thus middles can have no object promotion and truly preserve the base subject. However, a common reading here is that the subject possesses the NP. This *might* suggest that the subject is not the agent but a raised possessor, and thus *ber-* eliminates the subject as in §2.1.
- However, possession is not required; it just a strong default. Plus, in all cases the subject is necessarily the agent as determined by the verb. Thus it must be the base verbal subject.

Incorporation middles have a nearly transitive syntax, albeit with the object incorporated. That both participants are overt argues against a “low elaboration” analysis of middles.

2.3 Incorporated Reflexive Middles

- A third family of middles have a reflexive interpretation, and fall into two broad groups. First, many verbs above may take short reflexive *diri* instead of an incorporated lexical NP:

(11) *Orang itu ber-jual=diri/ber-cuci=diri.*
 man that MV-sell=REFL/MV-wash=REFL
 ‘The man sold/washed himself.’ (e.g. sold into slavery)

- *Diri* shows signs of incorporation and is in complementary distribution with other NPs:

(12) *Gadis itu ber-cuci (*dengan cepat) (*sayur) diri(=*nya).*
 girl that MV-wash with quick vegetable REFL(=3SG)
 ‘The girl washed herself quickly.’

2.4 Natural Reflexives

- A fourth class of middles involves verbs that indicate naturally reflexive actions, of which body care verbs are the canonical cross-linguistic exemplar (Kemmer 1993).

(13)	Root	meN- form	ber- form
	<i>dandan</i> ‘dress’	<i>men-dandan</i> ‘dress’	<i>ber-dandan</i> ‘dress oneself’
	<i>cukur</i> ‘shave’	<i>men-cukur</i> ‘shave’	<i>ber-cukur</i> ‘shave oneself’
	<i>sisir</i> ‘comb’	<i>men-yisir</i> ‘comb one’s hair’	<i>ber-sisir</i> ‘to comb one’s hair’

- These are strictly intransitive and require no *diri*, despite having a reflexive interpretation, though *diri* is optional and shows signs of incorporation:

(14) *Tono ber-dandan/ber-cukur/ber-sisir(=diri=*nya).*
 Tono MV-dress/MV-shave/MV-combed=REFL=3SG.POSS
 ‘Tono dressed/shaved/combed (himself).’

2.5 Interim Summary

- The data can be classified on two parameters (15), with the emergent generalizations in (16).

(15)		non-reflexive	reflexive
	Incorporated NP	<i>ber-V=NP_{lex}</i>	<i>ber-V=NP_{diri}</i>
	No incorporated NP	middle construction	natural reflexive

- I suggest that the patterns can be explained through a combination of the specific syntactic and semantic properties of *ber-*, plus principles governing choices of equivalent expressions.

3 Initial Analysis

3.1 Basic Framework

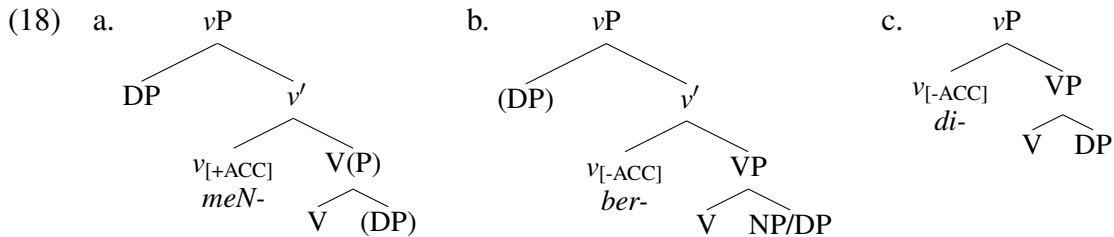
- The emergent generalizations from these data are (16).

(16) a. The base V is transitive, i.e. it takes subject and object DPs.
 b. The patient (i.e. the base object) is always expressed.
 c. The *ber-* form never takes a canonical direct object DP.
 d. The agent (i.e. the base subject) is not necessarily expressed, but can be.

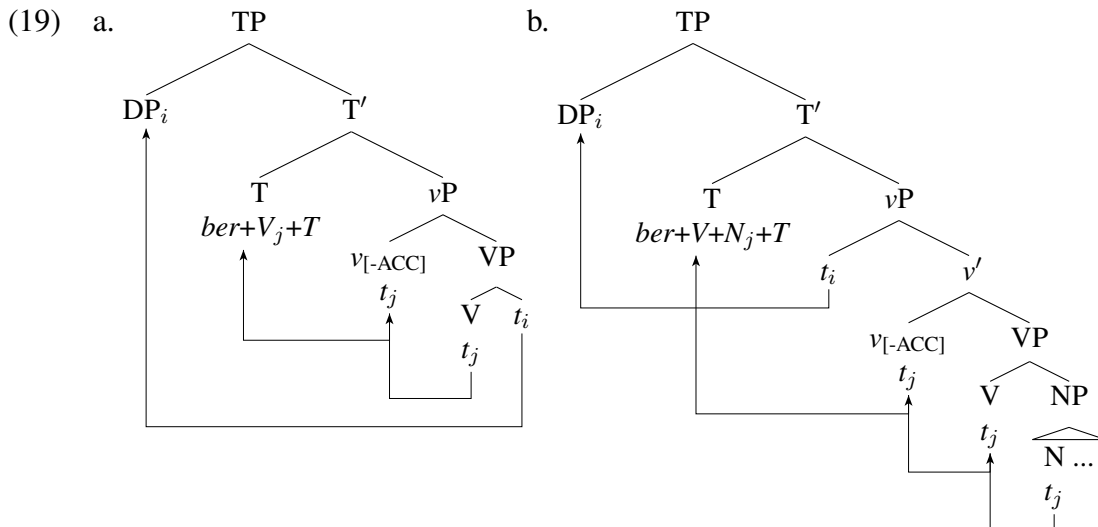
- I propose that the properties (16a-c) are not surprising, but are inherited from its paradigmatic function as a non-active voice in an accusative language (Alexiadou and Doron 2012). The only unique property distinguishing it from a passive is (16d), an active-like property.
- Since I am assuming the incorporation is syntact, I will also tentatively assume a syntactic analysis of voice, though a lexicalist analysis is possible on both fronts.

- (17) a. I assume verbs directly select their subjects semantically (contra Kratzer 1996).
 b. Indonesian voices are light verbs (here *v*) licensing argument DPs (Soh 2013).
 c. All clauses must have one direct DP argument (the EPP; Chomsky 1981).
 d. Voice morphology checks Accusative Case (Aldridge 2008).
 e. I assume that incorporated NPs do not need Case (Baker 1988: 106-119).

- *Ber-* takes a VP complement and optional subject DP but does not check Accusative, getting (16). *MeN-* requires a subject DP and checks Accusative; *di-* resists both, but takes a VP.



- This one definition derives two *ber-* forms syntactically (with actual spell outs lexicalized):



- I suggest one semantics for *ber-*: it saturates the first argument of the VP with an open variable (underlined for expository purposes), reducing the semantic valency by one but otherwise not meddling with its truth conditional content (building on the analysis of Beavers and Zubair 2013 on Colloquial Sinhala anticausatives; see also Kaufmann 2007, Piñón 2012):

$$(20) \quad \llbracket ber- \rrbracket = \lambda P_{\langle e, \alpha \rangle} [P(\underline{x})] \quad \text{(alternatively: } \llbracket ber- \rrbracket = \lambda P_{\langle e, \alpha \rangle} \exists x [P(x)])$$

- How is this open variable interpreted? There are two (logical) possibilities:

- (21) a. \underline{x} has disjoint reference with the other argument of V (e.g. \exists -binding); or
 b. \underline{x} does not have disjoint reference with the other argument of V (reflexive/reciprocal).

- Thus *ber-* reduces the verb’s semantic valency. However, given *ber-*’s variable syntax in (19), which argument is suppressed will depend on whether the external argument is projected.
- This is quite unlike a passive, which only has one syntactic output, only kills one argument semantically, and only utilizes one interpretation (disjoint reference) for that argument.

Ber- forms are syntactically and semantically monadic, but the syntax affects which argument is overt and which is suppressed, the interpretation of the later left open.

3.2 Object Promotion Middles: Middle Constructions and Natural Reflexives

- If the verb takes a deep object DP — even if it moves — the VP’s first argument must be the agent, which is what *ber-* saturates. This can explain middle constructions. I assume traces represent open variables λ -abstracted over just prior to saturation of their antecedents (Heim and Kratzer 1998), I ignore tense but assume T binds e , and head movement reconstructs.

- (22) a. [*Mobil itu*]_{*i*} *ber-jual* *t_i* (*dengan mudah*)
 car that MV-sell with easy
 ‘The car sold/sells (well).’
- b. $\llbracket \text{jual} \rrbracket(\llbracket t_i \rrbracket)$ (functional application)
 $= \lambda y \lambda x \lambda e [\text{sell}'(e) \wedge \text{agent}'(e, x) \wedge \text{theme}'(e, y)](\underline{y})$
 $= \lambda x \lambda e [\text{sell}'(e) \wedge \text{agent}'(e, x) \wedge \text{theme}'(e, \underline{y})]$
- c. $\llbracket \text{ber-} \rrbracket(\llbracket \text{VP jual } t_i \rrbracket)$ (functional application)
 $= \lambda P[\underline{P}(\underline{x})](\lambda x \lambda e [\text{sell}'(e) \wedge \text{agent}'(e, x) \wedge \text{theme}'(e, \underline{y})])$
 $= \lambda e [\text{sell}'(e) \wedge \text{agent}'(e, \underline{x}) \wedge \text{theme}'(e, \underline{y})]$
- d. $\llbracket \llbracket \text{T } \text{ber-jual } t_i \rrbracket \rrbracket$ (T binds e plus λ -abstraction over \underline{y})
 $= \lambda y \exists e [\text{sell}'(e) \wedge \text{agent}'(e, \underline{x}) \wedge \text{theme}'(e, \underline{y})]$
- e. $\llbracket \llbracket \text{T } \text{ber-jual } t_i \rrbracket \rrbracket(\llbracket \llbracket \text{DP Mobil itu }]_i \rrbracket)$ (functional application)
 $= \lambda y \exists e [\text{sell}'(e) \wedge \text{agent}'(e, \underline{x}) \wedge \text{theme}'(e, \underline{y})](\text{car}')$
 $= \exists e [\text{sell}'(e) \wedge \text{agent}'(e, \underline{x}) \wedge \text{theme}'(e, \text{car}')]$

- There are two options for interpreting \underline{x} . Non-coreference is one reading, which I assume is \exists -binding — the weakest semantics fitting all data (generic being a further extension).

$$(23) \quad \exists e [\text{sell}'(e) \wedge \text{agent}'(e, \underline{x}) \wedge \text{theme}'(e, \text{car}')] \approx \exists x \exists e [\text{sell}'(e) \wedge \text{agent}'(e, x) \wedge \text{theme}'(e, \text{car}')]$$

- However, a reflexive reading is out. This is in contrast with naturally reflexive cases, which on the analysis above have the same syntax as middle constructions but can be reflexive:

- (24) [*Orang itu*]_{*i*} *ber-cuci* *t_i*.
 man that MV-wash
 ‘The man washed.’ $\approx \exists e [\text{wash}'(e) \wedge \text{agent}'(e, \text{man}') \wedge \text{theme}'(e, \text{man}')]$

- I suggest the root constrains the readings (Kemmer 1993, Alexiadou and Doron 2012):

- Natural reflexives have a default expectation of self-action; other verbs have non-self-action. The default readings of *ber-* forms are those that match those expectations.
- The non-existence of a reflexive reading in disjoint verbs arises from expressiveness: this is a marked meaning and there is marked form — incorporated *diri* — blocking it.
- An MC reading *is* possible for inherent reflexives, there being no marked alternative:

(25) [*Orang itu*]_i *ber-cuci* t_i (*dengan mudah*).
 man that MV-wash with easy

‘The man washes easily.’ $\approx \exists x \exists e [wash'(e) \wedge agent'(e, x) \wedge theme'(e, \mathbf{man}')]]$

Middle constructions and inherent reflexives both arise from the agent suppression. There are in principle two options for interpreting it, depending on lexical properties of the root.

3.3 Object Incorporation Middles

- That incorporation co-occurs with a detransitivization marker suggests that it itself does not reduce the verb’s valency, as with Mithun’s (1984) Type IV or Rosen’s (1989) classifier incorporation, but unlike in e.g. Gunwinggu an additional proper object cannot be licensed.

(26) ... *bene-dulg-nay mangaralaljmayn*.
 they.two-tree-saw cashew.nut

‘... They saw a cashew tree.’

(Gunwinggu; Mithun 1984: 867, (92))

- I treat classifier incorporation of $\langle e, t \rangle$ NP to $\langle e, \langle e, \langle v, t \rangle \rangle \rangle$ V (*v* the type of events) as systematic verbal polysemy deriving an alternate V taking the NP as an argument and predicating it of the V’s theme (Dayal 2011) but not killing the original argument.

(27) a. $\llbracket V_I \rrbracket = \lambda P \lambda x \lambda y \lambda e [\llbracket V \rrbracket (x, y, e) \wedge P(x)]$

b. $\llbracket jual_I [_{NP} mobil merah] \rrbracket$

$= \lambda x \lambda y \lambda e [sell'(e) \wedge agent'(e, y) \wedge theme'(e, x) \wedge car'(x) \wedge red'(x)]$

- Here the first argument of the VP is the patient, and thus *ber-* serves to saturate this.

(28) $[_{TP} Tono_i [_{T'} T [t_i [_{v'} ber-[_{VP} jual_I=mobil merah]]]]]$ ‘Tono sold his red car.’

a. $\llbracket ber \rrbracket (\llbracket [_{VP} jual_I=mobil merah] \rrbracket)$ (functional application)
 $= \lambda y \lambda e [sell'(e) \wedge agent'(e, y) \wedge theme'(e, \underline{x}) \wedge car'(\underline{x}) \wedge red'(\underline{x})]$

b. $\llbracket [_{v'} ber-jual_I=mobil merah] \rrbracket (\llbracket t_i \rrbracket)$ (functional application)
 $= \lambda e [sell'(e) \wedge agent'(e, \underline{y}) \wedge theme'(e, \underline{x}) \wedge car'(\underline{x}) \wedge red'(\underline{x})]$

c. $\llbracket [_{T'} T t_i ber-jual_I=mobil merah] \rrbracket$ (T binds *e*, λ -abstract over *y*)
 $= \lambda y \exists e [sell'(e) \wedge agent'(e, y) \wedge theme'(e, \underline{x}) \wedge car'(\underline{x}) \wedge red'(\underline{x})]$

d. $\llbracket [_{T'} T t_i ber-jual_I=mobil merah] \rrbracket (\llbracket [_{DP} Tono]_i \rrbracket)$ (functional application)
 $= \exists e [sell'(e) \wedge agent'(e, \mathbf{Tono}') \wedge theme'(e, \underline{x}) \wedge car'(\underline{x}) \wedge red'(\underline{x})]$

- A disjoint reading arises for \underline{x} , the only pragmatically plausible reading.

(29) $\approx \exists x \exists e [sell'(e) \wedge agent'(e, \mathbf{Tono}') \wedge theme'(e, x) \wedge hat'(x) \wedge red'(x)]$

- Alternatively, the NP could be *diri*, giving rise to a reflexive reading:

(30) *Tono ber-jual_I=diri*.

Tono MV-sell=REFL

‘Tono sold himself.’ (e.g. into slavery)

- I treat *diri* as $\langle e, t \rangle$, vacuous but independently triggering reflexivization (Chierchia 2004: 30). The derivation for (30) is the same as for (28), save that \underline{x} is substituted by **Tono'**:

$$(31) \quad \exists e[\textit{sell}'(e) \wedge \textit{agent}'(e, \textit{Tono}') \wedge \textit{theme}'(e, \textit{Tono}')]]$$

A quasi-transitive syntax results in the patient being suppressed. Since this involves incorporation, the only reading is some binding relation unless the incorporated NP is reflexive.

3.4 Summary

- Various middles arise from how one rule of argument suppression interacts with the syntax:

(32) Middle	Agent	Patient	Root	Reading
Natural reflexive	\underline{x}	DP	Natural reflexive	Non-disjoint
Middle construction	\underline{x}	DP	Any	Disjoint
Non-reflexive incorporation	DP	\underline{x} (NP _{lex})	Any	Disjoint
Reflexive incorporation	DP	\underline{x} (NP _{diri})	Any	Non-disjoint

- I look next at some additional cases, ultimately arriving at reciprocals.

4 Middles with Non-Verbal Roots: Object Promotion and Incorporation

- A fifth *ber-* type with a nominal rather than verbal base further validates this approach, which shows signs also of syntactic incorporation like other Ns:

- (33) a. *Tono ber-topi/ber-istri/ber-kaki.*
 Tono MV-hat/MV-wife/MV-leg
 ‘Tono had a hat/a wife/legs.’
- b. *Wanita itu ber-tangan (mulus) (*itu=nya)*
 woman that MV-hand smooth that/=3SG.POSS
 The woman has (those/these) smooth hands.’ (stranded modifiers, no D/Poss)

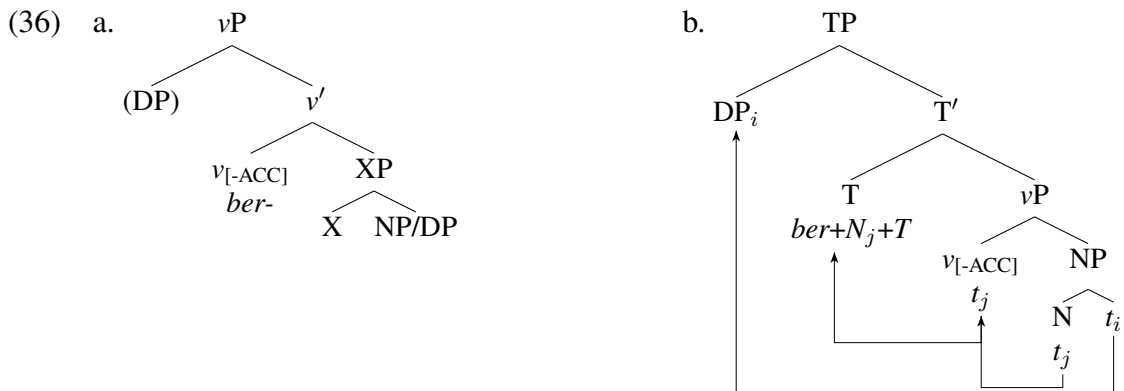
- Only body part, kin term, and clothing nouns are possible, i.e. noun classes cross-linguistically attested as being relational (Nichols 1988, Chappell and McGregor 1996, Tsunoda 1996). These are type $\langle e, \langle e, \langle, v, t \rangle \rangle \rangle$, contributing a possession relation π' (Barker 1995).

(34) Root	<i>ber-</i> form	
<i>kaki</i> ‘leg’	<i>ber-kaki</i> ‘have legs’	
<i>mulut</i> ‘mouth’	<i>ber-mulut</i> ‘have a mouth’	
<i>tangan</i> ‘hand’	<i>ber-tangan</i> ‘have hands’	(body parts)
<i>istri</i> ‘wife’	<i>ber-istri</i> ‘have a wife’	
<i>suami</i> ‘husband’	<i>ber-suami</i> ‘have a husband’	
<i>adik</i> ‘younger sibling’	<i>ber-adik</i> ‘have a younger sibling’	(kin terms)
<i>baju</i> ‘dress’	<i>ber-baju</i> ‘have a dress on’	
<i>sepatu</i> ‘shoes’	<i>ber-sepatu</i> ‘have shoes on’	
<i>topi</i> ‘hat’	<i>ber-topi</i> ‘have a hat on’	(clothing)

- These also bear no semantic relationship to the related *meN-* form, e.g. *men-topi-kan* ‘AV-hat-CAUS’ entails causation, but not *ber-topi*, as in (35a). The better correspondent is ‘have’:

- (35) a. *Dia_i ber-topi tetapi dia_i tidak men-(t)opi-kan=diri.*
 3SG MV-hat but 3SG NEG AV-hat-CAUSE=REFL
 ‘He wore a hat but did not put the hat on himself.’
- b. *Amin mem-punyai istri/topi/adik.*
 Amin AV-have wife/hat/younger sibling
 ‘Amin has a wife/ a hat/ a younger sibling.’

- The assertion of (35b) is dependent on the N (part/whole for body parts, etc.), and thus Partee (1999) analyzes ‘have’ verbs with relational objects as raising verbs; (33a) are the same.
- These data all suggest (33a) are derived from the N itself. The analysis will be just like object promotion, if we simply allow that *ber-* can take NP as well as VP complements:



- *Ber-* saturates the possessum predicate; non-coreference is the only plausible reading.

- (37) a. *Tono ber=topi merah.*
 Tono MV=hat red
 ‘Tono wore his red hat’
- b. $\exists e[\pi'(e) \wedge agent'(e, \mathbf{Tono}') \wedge theme'(e, \underline{x}) \wedge hat'(\underline{x}) \wedge red'(\underline{x})]$
 $\approx \exists x \exists e[\pi'(e) \wedge agent'(e, \mathbf{Tono}') \wedge theme'(e, x) \wedge hat'(x) \wedge red'(x)]$

The principles generating denominal middles are the same as object promotion deverbals, plus also incorporation, resulting in conflation à la Hale and Keyser (2002).

5 An Extension: Reciprocals (finally!)

- *Ber-* also indicates reciprocals, an historical function now taken over by a circumfix *ber-an* and a quasi-auxiliary *saling*, in addition to reciprocal pronouns like *satu sama lain* ‘one another’ (Sneddon 1996, Ogloblin and Nedjalkov 2007, Udayana 2017):

- (38) a. *Amir me-negur Tono.* d. *Amir dan Tono me-negur satu sama lain*
 Amir AV-greet Tono Amir and Tono AV-greet one another
 ‘Amir greeted Tono.’ ‘Amir and Tono greeted each other.’
- b. *Amir dan Tono ber-tegur-an.* e. ?*Amir ber-tegur-an dengan Tono.*
 Amir and Tono BER-greet-AN Amir BER-greet-AN with Tono
- c. *Amir dan Tono saling me-negur.* f. ?*Amir saling me-negur dengan Tono.*
 Amir and Tono RECIP AV-greet Amir RECIP AV-greet with Tono
 ‘Amir and Tono greeted each other.’

- Circumfix *ber- -an* seems separate from simple *ber-*, so we focus for now on just the latter.
- One apparently robust reciprocal type has nominals bases like those in §4:

(39) a. *Amir dan Yusuf ber-sahabat.* b. *Amir ber-sahabat dengan Yusuf.*
 Amir and Yusuf MV-friend Amir MV-sahabat with Yusuf.
 ‘Amir and Yusuf are friends.’

- Notably, (39a) also has a “has (a) friend(s)” reading, suggesting a strictly disjoint reading is available. We can thus assimilate these to the *ber-topi* type, treating plurals as mereological sums and comitative *dengan* as applying to a *vP* to create a plural reading for the subject:

(40) a. $\approx \exists x \exists e [\pi'(e) \wedge agent'(e, \mathbf{Yusuf}' \oplus \mathbf{Amir}') \wedge theme'(e, x) \wedge friend'(x)]$
 b. $\llbracket \textit{dengan} \rrbracket = \lambda z \lambda P \lambda y [P(y \oplus z)]$

- Where does the reciprocal reading come from? Bases allowing reciprocal readings are lexically fixed — *ber-dandan* ‘MV-dress’ has only a reflexive reading, and *ber-topi* neither a reflexive nor reciprocal reading — and also all describe symmetrical, irreflexive relations:

(41)	Root	ber- form
	<i>sahabat</i> ‘friend’	<i>ber-sahabat</i> ‘be friends’
	<i>tetangga</i> ‘neighbor’	<i>ber-tetangga</i> ‘be neighbors’
	<i>tunangan</i> ‘fiance/fiancee’	<i>ber-tunangan</i> ‘be engaged’

- We tentatively assume that in addition to a truly disjoint reading a non-disjoint reading with plural subjects is lexically determined to be interpreted as a naturally reciprocal relation (e.g. Strong Reciprocity as per Dalrymple et al. 1998), here by meaning postulate.

(42) a. $\approx \exists e [\pi'(e) \wedge agent'(e, \mathbf{Yusuf}' \oplus \mathbf{Amir}') \wedge theme'(e, \mathbf{Yusuf}' \oplus \mathbf{Amir}') \wedge friend'(\mathbf{Yusuf}' \oplus \mathbf{Amir}')]$
 b. For plural referent z , $[\exists e [\pi'(e) \wedge agent'(e, z) \wedge theme'(e, z) \wedge friend'(z)]] \leftrightarrow \exists e [\mathbf{recip}'(z, \lambda y \lambda x \exists e [\pi'(e) \wedge agent'(e, x) \wedge theme'(e, y) \wedge friend'(y)]]]$

- A verbal use is required for this — a copular use has only a “is somebody’s friend” reading:

(43) *Amir dan Yusuf sahabat (saya).*
 Amir and Yusuf friend 1SG
 ‘Amir and Yusuf are someone’s/my friends.’

- A separate class of nominal roots are those indicating naturally reciprocal situations:

(44) *Amir dan Yusuf ber-debat.*
 Amir and Yusuf MV-debate
 ‘Amir and Yusuf argue.’

(45)	Root	ber- form
	<i>dialog</i> ‘dialogue’	<i>ber-dialog</i> ‘carry on a dialogue’
	<i>perang</i> ‘war’	<i>ber-perang</i> ‘be at war’
	<i>padan</i> ‘correspondence’	<i>ber-padan</i> ‘correspond, keep in touch with each other.’

- Here a possessive relation would not be appropriate. However, *ber-* denominals without possessive readings are also possible with other event nominals, including non-reciprocal cases:

(46) *Dia ber-keringat/ber-sepeda/ber-piknik.*
 3SG MV-sweat/MV-bicycle/MV-picnic.
 ‘He sweats/bikes/picnics.’

- A natural extension of our analysis to these is that they are also relational nouns but not introducing a possessive relation, instead introducing some other event type:

(47) a. $\llbracket \textit{keringat} \rrbracket = \lambda x \lambda y \lambda e [\textit{produce}'(e) \wedge \textit{agent}'(e, y) \wedge \textit{patient}'(e, x) \wedge \textit{sweat}'(x)]$
 b. $\llbracket (46) \rrbracket \approx \exists x \exists e [\textit{produce}'(e) \wedge \textit{agent}'(e, \mathbf{he}) \wedge \textit{patient}'(e, x) \wedge \textit{sweat}'(x)]$

- In the nominals in (45) there’s no sortal referent, just an event referent. We don’t propose a specific analysis of that here but just assume for now that the noun base semantics is identical to a corresponding verb (and let category determine predication vs. reference):

(48) $\llbracket \textit{debat} \rrbracket = \lambda x \lambda y \lambda e [\textit{agent}'(e, y) \wedge \textit{patient}'(e, x) \wedge \textit{debate}'(e)]$

- What makes the reciprocal cases distinct is that they are again symmetric and irreflexive.
- Assuming *ber-* again suppresses the patient and we can get a plural subject on a non-disjoint reading, we take it again to be a lexically determined fact that a reciprocal reading applies with a meaning postulate similar to the one above for *sahabat* ‘friend’.

(49) $\llbracket (44) \rrbracket \approx \exists e [\textit{agent}'(e, \mathbf{Yusuf}' \oplus \mathbf{Amir}') \wedge \textit{patient}'(e, \mathbf{Yusuf}' \oplus \mathbf{Amir}') \wedge \textit{debate}'(e)]$

- There is a (small?) class of verb roots that admit *ber-* reciprocals:

(50)	<i>meN-</i> form	<i>ber-</i> form
	<i>mem-bantah</i> ‘object’	<i>ber-bantah</i> ‘wrangle’
	<i>men-macu</i> ‘chase’	<i>ber-macu</i> ‘race (with one another)’

- Here it is easy to see how a non-disjoint analysis of the sort in §2.4 might apply. More problematic are stative verbs/adjectives, sometimes with reduplication (an independent property of some productive reciprocals often to indicate iterativity or intensity):

(51)	Root	<i>ber-</i> form
	<i>damai</i> ‘peaceful’	<i>ber-damai</i> ‘make up with each other’
	<i>cepat</i> ‘fast’	<i>ber-cepat-cepat</i> ‘compete in speed’
	<i>kuat</i> ‘strong’	<i>ber-kuat-kuat[-an]</i> ‘compete in strength’

- These are $\langle e, \langle v, t \rangle \rangle$, so how does *ber-* apply? Interestingly, another class like this exists independently as reflexives as in (52).

(52)	Adjective (root)	Middle
	<i>sedih</i> ‘sad’	<i>ber-sedih(=diri)</i> ‘sadden oneself’
	<i>sabar</i> ‘patient’	<i>ber-sabar(=diri)</i> ‘cause oneself to be patient’
	<i>bangga</i> ‘proud’	<i>ber-bangga(=diri)</i> ‘cause oneself to be proud’

- With these the meaning is what would be a reflexive of the corresponding deadjectival causative *meN-* form, suggesting the verb as the base and not the adjective:

(53) *Orang itu meny-(s)edih-kan=diri/diri=nya/bapak-nya.*
 man that AV-sad-CAUS=REFL/REFL-3SG.POSS/father=3SG.POSS
 ‘The man made himself/his father sad/happy/far.’

- We believe the reciprocal cases are derived from verbal *meN-* *kan* forms (e.g. *meny-cepat-cepat-kan* ‘AV-fast-fast-KAN’ ‘make increasingly fast’) plus some meaning postulate, where the reading of ‘make each other fast’ is conventionally used to mean ‘race’.

Although this is just a sketch, it suggests the reciprocals can be assimilated to the cases of reflexives, but just as with those that default to reflexive vs. middle construction readings the nature of the root determines exactly how to interpret the suppressed argument.

6 Whither Anticausatives?

- Although anticausatives are often middles, *ber-* does not do anticausatives. I suggest this is due to several factors. First, Indonesian is a causativizing language (Son and Cole 2008).

(54) a. *Baju itu meng-(k)ering.*
 shirt that AV-dry
 ‘The shirt dried.’
 b. *Dia meng-(k)ering-kan baju itu.*
 3SG AV-dry-CAUSE shirt that
 ‘(S)he dried the shirt.’

- Thus for what paradigm reflects causative alternations we’d expect few *ber-* forms.
- Further, when they arise they are middle constructions; the only way to form an anticausative is with a special *ter-* prefix (that also has a separate involuntary passive use):

(55) a. *Komandan itu mem-(p)ecah(-kan) pasukan itu.*
 commander that AV-break-CAUSE troop that
 ‘The commander broke (the formation of) the troops.’
 b. *Pasukan itu ber-(p)ecah dua #tapi tidak ada yang mem-ecah=nya.*
 troop that MV-break two but NEG exist REL AV-break=3SG
 ‘The troops broke into two but nobody broke them.’
 c. *Pasukan itu ter-(p)ecah dua tapi tidak ada yang mem-ecah=nya.*
 troop that INC-break two but NEG exist REL AV-break=3SG
 ‘The troop broke into two but nobody broke them.’ (On intended reading)

- Why does *ber-* not license standard inchoatives or anticausatives?
 - *ber-* cannot apply to a lexical inchoative. These are type $\langle e, \langle v, t \rangle$ and unaccusative. After combining with the object trace they are $\langle v, t \rangle$ and incompatible with *ber-*.
 - In the few cases where an anticausative is lexicalized, *ter-* is a special form for this class — which we can treat for example as reflexives (or whatever) of caused change-of-state verbs lacking agentive entailments of their causers (Koontz-Garboden 2009).
 - This blocks *ber-*, leaving it for non-reflexive readings.

7 Deponent forms

- Briefly, we note that there are a number of deponent *ber-* forms. These could be derived from some unrealized transitive base or are just lexically listed (Chierchia 2004: 39-40).
- In principle both could be true of various forms; in the former case the prediction is that they will otherwise behave like middles in terms of their semantic and syntactic properties. In the other case they will not. More broadly, these should be the exception, not the rule.
- One class are unergative verbs describing manners of motion, such as *lari* ‘run’, which may be due to translational motion verbs having an underlyingly reflexive semantics (as per Kemmer 1993: 69-70 and Van Valin and LaPolla 1997: 111):

(56) *Ali ber-lari*
Ali MV-run
‘Ali ran.’

- Thus these might be principled. Deponent reciprocals also occur:

(57) *ber-bicara* ‘converse’, *ber-juang* ‘struggle’, *be-runding* ‘confer’, *ber-gurau* ‘joke (with one another)’, *ber-tempur* ‘fight’, *ber-gaul* ‘associate with’, *ber-kelahi* ‘fight’, *ber-temu* ‘meet’, *ber-gualt* ‘fight’, *ber-simpang-siur* ‘cross each other, intermingle’

- Again, given that reciprocals broadly pattern among non-disjoint reference *ber-* uses then again these could just be a type of *ber-* marking reflecting this type of underlying semantics, though like motion verbs they could possibly be “derived” from some unrealized base.

8 Conclusion

- The central ingredients of middle voice of Indonesian are:
 - The middle has one surface DP corresponding to one semantic argument, either the subject or object of the base (with the referent of the base object overt in some sense).
 - The other argument is maintained truth conditionally but not taken as a direct argument, and thus the syntax projects one fewer arguments than the base needs.
 - This argument is interpreted according to the strategies available in a given language, given root meaning and other basic principles, accounting for the range of middles.
- Indonesian has an unusually large range of ways of satisfying these constraints (including incorporation and relational noun roots), exemplifying some of the harder to see ingredients.
- How languages vary on each ingredient is, though, a still an open question.
 - A language like Spanish may have the same middle formation (e.g. *se* is like *ber-*) but owing to a lack of incorporation of the appropriate sort only object promotion surfaces.
 - A language like Sinhala may also have the same middle formation (e.g. the Causer Suppression of Beavers and Zubair 2013) but heavy limits on verbs that allow it (owing to its intransitivity with involitive and volitive mood marking) necessitate a true family of constructions (see Beavers and Zubair 2016).
- Thus it is not that all middles have a unified analysis of the overall category, but rather it is possible that some core will be built around a unified analysis.

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