

Cross-Paradigmatic Metaphorical Structure: A Case of Indonesian MAJU vs MUNDUR in Voice Alternation

Derry Sulisti Adi Putra *

Universitas Gadjah Mada, DIY, Indonesia

ABSTRACT

Operating within a usage-based, constructionist framework, this paper investigates the semantic dynamics of Indonesian voice alternation, primarily challenging the Meaning-Preserving Hypothesis (MPH). We demonstrate this via a cross-paradigmatic corpus study utilizing a one-million-word 2024 Indonesian news dataset, analyzing the distribution of metaphorical senses of the antonyms MAJU ‘move forward’ and MUNDUR ‘move backward’ across active (meN-) and passive (di-) voice constructions. The results reveal statistical asymmetries and categorical gaps in how these verbs’ metaphorical senses are used. This provides empirical evidence against abstract semantic stability, showing that metaphorical meaning is not just mapped from an abstract concept but is instead bound to specific, surface-level grammatical constructions. Ultimately, this data-driven approach highlights the Invariance Hypothesis (IH) as a parallel theoretical issue and provides novel empirical support for a non-derivational, symmetrical analysis of Indonesian voice.

ARTICLE INFO

Paper type:
Research Article

Article history:
Received: 19/12/2025
Revised: 26/02/2026
Accepted: 27/02/2026

Keywords:

- Dalupa Poetry
- Semantics
- Voice
- Conceptual Metaphor
- Construction Grammar
- Cognitive Linguistics
- Corpus Linguistics

1. Introduction

This paper stands on two states of the art. First, within Conceptual Metaphor Theory (CMT) (Lakoff & Johnson, 1980), the Invariance Hypothesis (IH) (Lakoff, 1990; 1993; Turner, 1990) posits that the cognitive topology of a source domain is strictly preserved when mapped to a target domain. However, this assumption of structural preservation has been increasingly debated. Scholars point out that cross-domain mapping is rarely perfectly consistent, especially across antonymic pairs (Deignan, 1999), and that the target domain actively shapes the metaphor rather than serving as a passive receptacle (Croft, 2009). This friction highlights a shift from viewing metaphor as a rigid, abstract mapping to recognizing it as a dynamic, context-sensitive process.

Second, within the debate surrounding voice systems in Austronesian languages, the Meaning-Preserving Hypothesis (MPH) (Kroeger, 2005; 2007) has been heavily scrutinized. The MPH traditionally assumes that voice alternations (e.g., active versus passive) reflect purely syntactic reorganizations of arguments without altering the underlying lexical semantics of the verb. Investigating whether MPH is tenable is crucial because it somehow underlies the current state of how Austronesian voice should be treated – whether as an asymmetrical derivation (where one voice is basic and meaning is preserved) or a symmetrical system of independent constructions (Arka, 2003; Riesberg, 2014; McDonnell, 2016). Recent corpus studies (Rajeg et al., 2020; 2022; Rajeg & Arka, 2023) have challenged the MPH, showing that voice alternations often entail distinct semantic changes, thereby supporting the symmetrical approach.

Among the literature, the theoretical relationship between these two seemingly disparate issues has not been explicitly identified. This paper argues they are parallel manifestations of the same underlying

* derry.s.a@mail.ugm.ac.id (Putra)

linguistic phenomenon. The theoretical bridge connecting them is Construction Grammar (CxG) (Goldberg, 1995, 2006; Croft, 2001). The convergence lies in their underlying epistemological assumptions: both the IH and the MPH are fundamentally *semantic stability hypotheses*. The IH assumes that an abstract metaphorical mapping remains stable regardless of the target, while the MPH assumes that a verb's core meaning remains stable across morphosyntactic voice alternations. Construction Grammar fundamentally rejects this premise of abstract stability. Instead, CxG posits that meaning is inherently *surface-based* (Goldberg, 2002); grammatical forms are not derived from one another, but are constructions that are meaningful in their own right (Goldberg, 1995). Therefore, any linguistic utterance is the product of the interaction between the lexical semantics of a word and the specific frame semantics of the grammatical construction it inhabits (Fillmore et al., 1988).

Motivated by this theoretical convergence, this paper explores both hypotheses simultaneously by analyzing the metaphorical mapping of the Indonesian antonymic pair MAJU ‘move forward’ and MUNDUR ‘move backward’. Specifically, to guide the reader, this study investigates two core research questions:

- RQ1. To what extent are the metaphorical mappings of MAJU and MUNDUR construction-specific rather than universally consistent?
- RQ2. Does voice alternation (active *meN-* vs. passive *di-*) preserve meaning across these metaphorical senses, or do these grammatical forms exhibit sense-sensitivity?

This study is novel in its empirical approach to these theoretical questions. While previous work (e.g., Rajeg et al., 2022) identified sense-sensitivity in Indonesian voice using older datasets, this study employs a cross-paradigmatic design utilizing a contemporary 2024 corpus. By systematically comparing an orientational antonym pair across an active/passive paradigm, this study seeks to provide robust, data-driven evidence that metaphorical mapping is embodied, culturally embedded, and firmly construction-specific.

2. Methods

This study employs a quantitative, corpus-based methodology (Gries, 2017; Stefanowitsch, 2020) to empirically test IH and MPH simultaneously. The analysis is “cross-paradigmatic,” examining how the metaphorical senses of an antonymic pair (MAJU vs. MUNDUR) are distributed across a grammatical paradigm (AV vs PV).

The data for this study was extracted from the `ind_news_2024_1M` corpus, a one-million-sentence collection of Indonesian news text from 2024, sourced from the Leipzig Corpora Collection (Goldhahn et al., 2012). This corpus was chosen as it reflects contemporary, formal usage, which is the locus of the grammatical phenomena under investigation. Furthermore, formal news discourse is highly relevant to this study because it provides an ideal environment for observing the conventionalization of metaphorical extensions – as journalists frequently rely on established spatial metaphors to describe abstract political and social events – while maintaining standard Indonesian voice alternations.

All occurrences of the four target applicative verb forms were retrieved from the corpus using the `corplinger()` package in R (Rajeg, 2021). To ensure exact matching and replicability, specific regular expression `"\\b(?:\\w*(maju|mundur)\\w*)\\b"` were employed, resulting in a complete dataset of 810 tokens.

The analysis proceeded in two stages, reflecting the paper’s dual theoretical aims. First, to investigate IH, all 810 tokens were manually coded for their semantic domain. To maintain strict internal consistency with the specific theoretical typologies utilized, coding was performed by a single annotator. The semantic categories were not generated *ad hoc* but were rigorously grounded in established CMT schemas (e.g. PROGRESS IS FORWARD MOTION) and the prior typologies of MAJU and MUNDUR identified by Rajeg et al. (2022). This process involved identifying the literal source domain and the metaphorical target domains. This coding scheme allows for a direct test of the IH by comparing the metaphorical profiles of the antonymic roots to see if their paradigmatic opposition is consistently mapped (Deignan, 1999) and whether the mapping is sensitive to the grammatical construction (Croft, 2009).

Second, to investigate MPH, the distribution of these semantic categories was cross-tabulated with the morpho-syntactic paradigm of voice. This sense-sensitive analysis (Rajeg et al., 2020, 2022) allows for a quantitative assessment of whether specific senses have become conventionalized in one voice form over the other. To determine the relationship between semantic sense and voice choice, Pearson's chi-square test of independence was conducted separately for MAJU and MUNDUR. It must be noted that due to the overall low frequency of MUNDUR tokens, some expected cell frequencies are small, which requires careful interpretation of the statistical power. Consequently, rather than viewing a significant p -value ($p < 0.05$) as an absolute statistical falsification, such a result is interpreted more cautiously as indicating a strong statistical association. This suggests that the active and passive forms have specialized for different semantic functions, providing robust evidence against the semantic stability hypothesis.

The data retrieval and statistical analysis were run in R (R Core Team, 2025). To ensure full methodological transparency, the dataset and R scripts are publicly available in an open science repository at Putra (2026).

3. Results and Discussion

The provided data (see Chart 1) reveals a highly significant statistical association between the verb roots MAJU and MUNDUR and the grammatical voice in which they are used ($\chi^2 = 42.2175, p < 0.00001$). This strong relationship, however, is not uniform; it is driven almost entirely by the distinct behavior of the verb MAJU. The root MAJU is strongly associated with the AV, accounting for 94.5% of its occurrences ($n_{AV} = 751; n_{PV} = 44$).

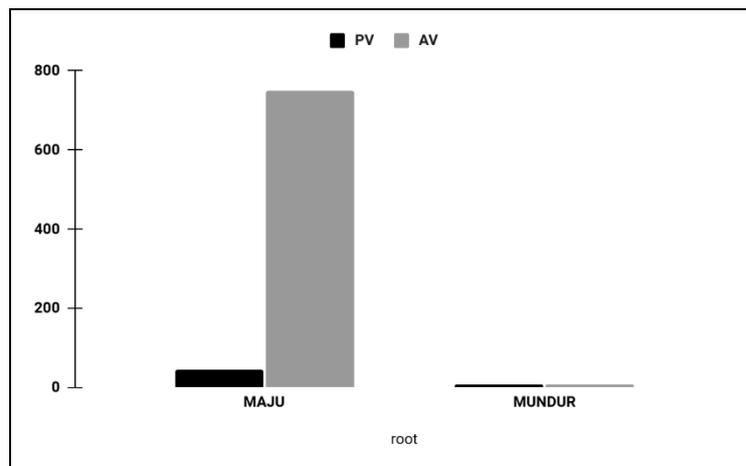


Chart 1. MAJU vs MUNDUR in Voice Alternation

This overwhelming preference for the active voice is explained by semantic specialization. The highly frequent AV form *memajukan* is used for the general, abstract, and high-frequency sense of ‘improving something.’ Conversely, the much rarer PV form *dimajukan* (5.5%) appears to be a specialized “mini-construction”—defined here as a highly specific pairing of form and meaning that operates at a lower, more lexically bound level of abstraction than general argument structure constructions (Boas, 2003; 2008; Perek, 2014). This passive mini-construction is conventionalized for a specific, lower-frequency meaning, such as ‘to be put forward’ or ‘nominated,’ which parallels the ‘proposing’ sense identified in Rajeg et al. (2022).

- (1) *Kami me-milik-i peran yang strategis dalam me-maju-kan*
 3PL AV-have-APPL role REL strategic in AV-move.forward-CAUS
berbagai sektor di Indonesia, termasuk olahraga. ()

various sector in Indonesia including sport
 ‘We have a strategic role in advancing various sectors in Indonesia, including sports.’

- (2) [...] *Ridwan Kamil atau RK di-maju-kan* *KIM plus*
 Ridwan Kamil or RK **PASS-move.forward-CAUS** KIM plus
di Pilkada Jakarta. (ind_news_2024_1M: 31044)
 in regional election Jakarta
 ‘Ridwan Kamil or RK was being nominated by KIM plus in the Jakarta regional election.’

The root MUNDUR presents a different, more subtle challenge to the MPH. While the raw frequencies appear balanced ($n_{AV} = 8, 53.3\%$; $n_{PV} = 7, 46.7\%$), the examples show that these two forms are not alternating the same meaning. Despite the low frequency, the examples again suggest semantic specialization rather than a simple voice alternation of the same meaning. While the AV form *memundurkan* is used in a temporal sense of ‘postponing’ or ‘moving back a schedule,’ the PV form *dimundurkan* carries a distinct meaning of ‘being removed’ or ‘forced to resign,’ as in example (4).

- (3) [...] *Studios me-mundur-kan* *jadwal rilis=nya menjadi*
 Studios **AV-move.backward-CAUS** schedule release=DET to be
1 Mei 2026. (ind_news_2024_1M: 603700)
 1 May 2026
 ‘Studios pushed back the release date to May 1, 2026.’
- (4) *Spekulasi publik akan me-muncul-kan apa benar yang*
 Speculation public FUT **AV-emerge-CAUS** Q true REL
bersangkutan berkeinginan mundur atau di-mundur-kan [...]
 concerned want move.backward or **PV-move.backward-CAUS**
 (ind_news_2024_1M: 895088)
 ‘Public speculation will raise questions about whether the person concerned really wants to resign or be resigned.’

This demonstrates a clear categorical gap and semantic specialization. The data does not show *memundurkan* being used to mean ‘to force someone to resign,’ nor *dimundurkan* to mean ‘be postponed.’ These are two distinct, independent constructions that happen to share a root. It is important to acknowledge that the low frequency of MUNDUR necessitates caution; this categorical absence could potentially be a corpus artefact rather than an absolute ontological gap in the language. However, the specific socio-pragmatic context of Indonesian political discourse strongly motivates this specialization. The *dimundurkan* ‘forced to resign’ sense functions as a conventionalized political euphemism, distancing the agent of the firing.

This result strongly undermines the MPH, which posits that active and passive voice forms of a verb share the same core meaning. Following the usage-based, constructional approach of Rajeg et al. (2020, 2022), these results demonstrate that voice alternation is highly sense-sensitive. The active and passive forms of MAJU and MUNDUR are not simple, interchangeable variants; they are independent, surface-based constructions that have become conventionalized for different, specialized meanings. This provides positive evidence for a symmetrical voice analysis, where AV and PV forms are independent constructions, not simple derivations of each other.

As shown in Chart 2, the data for MAJU provides quantitative evidence that challenges the MPH. A highly significant chi-squared test ($\chi^2 = 511.5379, p < 0.00001$) reveals that the choice between the AV and PV is not a random, meaning-preserving alternation. Instead, the forms are highly specialized for different semantic jobs, demonstrating a massive statistical asymmetry.

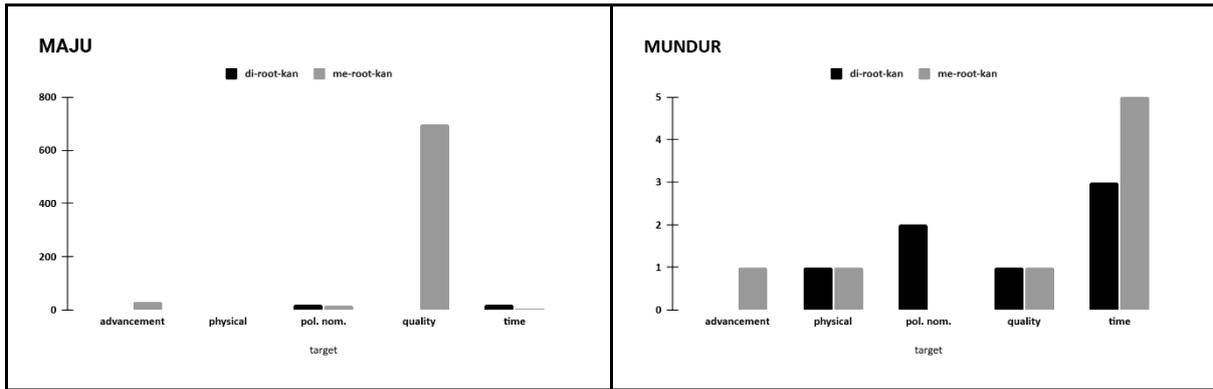


Chart 2. Semantic Comparison of MAJU vs MUNDUR

This specialization is most evident in the ‘quality’ sense, meaning ‘to improve’ or ‘advance’ a concept. This sense is almost exclusively the domain of the active voice, with 698 occurrences (99.8% of the ‘quality’ tokens) for *memajukan* compared to only one (0.2%) for *dimajukan*. This strong association might be interpreted as conceptually motivated by the embodied PROGRESS IS FORWARD MOTION metaphor, where societal or qualitative improvement is systematically conceptualized as physical advancement. This indicates that *memajukan* has become the entrenched, conventionalized mini-construction for this specific, high-frequency metaphorical meaning.

(5) PHYSICALLY MOVE FORWARD

[...] *Hartono me-maju-kan mobil secara berlahan sambil*
 Hartono AV-move.forward-CAUS car in a way slow while
berbelok ke kanan [...] (ind_news_2024_1M: 449707)
 turn to right
 ‘Hartono moved the car forward slowly while turning to the right.’

(6) MOVE FORWARD AS ADVANCEMENT

[...] *BRICS dapat menjadi kendaraan yang tepat untuk*
 BRICS can become vehicle REL appropriate PURP
membahas dan me-maju-kan kepentingan bersama
 discuss and AV-move.forward-CAUS interest shared
Global South [...] (ind_news_2024_1M: 461936)
 Global South
 ‘BRICS can become an appropriate vehicle to discuss and advance the shared interests of the Global South.’

(7) MOVE FORWARD AS NOMINATION

[...] *bakal ada sejumlah siasat lain yang bisa di-guna-kan,*
 FUT exist number strategy other REL can PV-use-CAUS
jika memang Presiden Joko Widodo ingin me-maju-kan
 if indeed President Joko Widodo want AV-move.forward-CAUS
anak bungsu=nya pada Pilkada DKI Jakarta
 child youngest=3SG.POSS in regional election DKI Jakarta
 (ind_news_2024_1M: 825764)
 ‘There will be a number of other strategies that can be used, if President Joko Widodo indeed wants to nominate his youngest child in the DKI Jakarta regional election.’

(8) MOVE FORWARD AS IMPROVING QUALITY

FISIP UI Open 2024 telah menjadi bukti komitmen
 FISIP UI Open 2024 PERF be evidence commitment
Universitas Indonesia dalam me-maju-kan Badminton
 Universitas Indonesia in AV-move.forward-CAUS Badminton
nasional (ind_news_2024_1M: 236165)
 national
 ‘FISIP UI Open 2024 has become evidence of the University of Indonesia’s commitment to improve the quality of national badminton.’

Conversely, the pattern flips for the temporal sense, meaning 'to move a date forward/earlier'. Here, the passive *dimajukan* is the strongly preferred construction, accounting for 84% of the temporal tokens ($n = 21$) compared to only 16% for the active ($n = 4$). The example in (3) illustrates a clear case of semantic specialization. The passive construction itself, in combination with this root, has conventionalized a specific temporal meaning.

(9) MOVE FORWARD AS NOMINATION

Hasto meny-(s)ebut-kan nama sejumlah kader partai ber-lambang
 Hasto AV-mention-CAUS name several cadre party INTR-symbol
banteng itu, yang ber-potensi di-maju-kan dalam
 bull DEM REL INTR-potential PV-move.forward-CAUS in
kontestasi (ind_news_2024_1M: 275275)
 contestation
 ‘Hasto mentioned the names of several cadres of the bull-emblem party who have the potential to be put forward in the contest.’

The only semantic category that behaves as the MPH would predict is the ‘political nomination’ sense, which alternates freely ($n_{AV} = 17$, 48.6%; $n_{PV} = 18$, 51.4%). This is clear in the direct contrast between (7) and (9). However, the general behavior of MAJU decisively shows that the MPH and IH are not tenable hypotheses for this verb. The active and passive forms are not simple variants; they are independent constructions that have specialized. The verb’s metaphorical mappings – from physical motion to quality or to time – are not uniform; they are bound to specific, surface-level grammatical forms.

The data for MUNDUR offers a different insight regarding IH. The chi-squared test for the senses that alternate (‘physical’, ‘quality’, ‘time’) is not significant ($p = 0.917856$). This is not because the hypothesis holds true, but because the low frequencies of the alternating senses (e.g., ‘time’ has 5 AV and 3 PV) mask the real story. The true challenge to the MPH for MUNDUR lies not in statistical preference, but in categorical gaps.

(10) MOVE BACKWARD AS DE-NOMINATION

Bambang di-mundur-kan karena di-anggap tidak mampu
 Hasto PV-move.backward-CAUS because PV-consider NEG able
mem-(p)enuh-i target yang di-beri-kan oleh pemerintah
 AV-fulfill-APPL target REL PV-give-CAUS by government
pusat (ind_news_2024_1M: 70595)
 Central
 ‘Bambang was ‘stepped back’ because he was considered unable to meet the targets set by the central government.’

(11) MOVE BACKWARD AS DE-ADVANCEMENT

DPR dan pemerintah harus segera meng-henti-kan pembahasan
 DPR and government must immediately AV-stop-CAUS discussion
revisi UU TNI yang kontroversial ini karena hanya akan

revision law TNI REL controversial DEM because only FUT
me-mundur-kan jalan=*nya* reformasi tubuh TNI
 AV-move.backward-CAUS process=DET reform body TNI
 (ind_news_2024_1M: 614913)

‘The DPR and the government must immediately halt the discussion of this controversial revision of the TNI Law because it will only set back the course of reform within the TNI.

It must be noted that in this third statistical test, the ‘advancement’ and ‘political nomination’ senses were discarded due to zero values in one column. The semantic inventories of *memundurkan* and *dimundurkan* are not the same. Specifically, the ‘political nomination’ sense, which for MUNDUR means ‘to be forced to resign’, was found only in the passive voice ($n = 2$, 100%). The example (10) represents a specialized, idiosyncratic meaning that has been conventionalized as a property of the passive construction *dimundurkan* itself. This meaning is not found in the active *memundurkan*. Conversely, the ‘advancement’ sense, meaning ‘to set back’, was found only in the active voice ($n = 1$, 100%) as exemplified in (11). While other senses, like the temporal ‘postpone’, appear to alternate freely, the existence of these non-alternating, specialized senses provides a clear, categorical challenge to the MPH.

These findings also indicate that a re-evaluation of the IH is due. The fact that the cross-paradigmatic analysis of MAJU vs MUNDUR resonates with previous claims on the inconsistency of mappings across antonyms (Deignan 1999) and voices (Croft 2009) indicates that metaphorical extension is not a purely abstract cognitive mapping. Rather, it is deeply tied to embodied spatial schemas – our physical experience of moving forward versus backward – which are then culturally conventionalized into specific grammatical forms. The target domain actively shapes the metaphor, and the grammatical construction provides the surface-level frame for that meaning to anchor.

4. Conclusion

This paper has demonstrated that the empirical challenges to the Invariance Hypothesis (IH) and the Meaning-Preserving Hypothesis (MPH) are not independent issues. They are parallel manifestations of a single, fundamental principle: meaning is surface-based and construction-specific. The corpus analysis of MAJU and MUNDUR provides data-driven evidence that undermines the MPH. This is evident in two distinct ways. First, MAJU demonstrates a massive statistical asymmetry. The active *memajukan* has become the entrenched construction for the ‘quality’ sense ($n = 698$), while the passive *dimajukan* has specialized in the ‘temporal’ sense ($n = 21$). Second, MUNDUR demonstrates categorical gaps. The passive *dimundurkan* possesses a unique ‘forced to resign’ sense, and the active *memundurkan* a unique ‘set back reform’ sense, both absent in the opposing voice. This sense-sensitive behavior contradicts the MPH because AV and PV forms operate as independent constructions.

The metaphorical mappings of the antonyms MAJU vs MUNDUR tend to be inconsistent, as the ‘quality’ sense is core to *memajukan* ($n = 698$) but virtually absent in its antonym *memundurkan* ($n = 1$). Furthermore, the target grammatical construction actively shapes meaning, as the metaphorical ‘forward in time’ sense maps preferentially to the passive construction *dimajukan*. Both stability hypotheses struggle because they incorrectly assume meaning is an abstract, stable property of a concept. This study shows, in contrast, that meaning is a surface-based property of specific, conventionalized constructions.

However, this study is not without limitations. The reliance on a formal news corpus may overrepresent specific sociopolitical metaphors (such as the ‘nomination’ and ‘forced resignation’ senses) while underrepresenting informal or colloquial usages of these verbs. Additionally, the sparse overall frequency of MUNDUR requires that the categorical gaps observed be interpreted with caution. Future research utilizing larger, more diverse spoken and informal corpora is necessary to confirm whether these gaps represent rigid grammatical constraints or corpus artefacts.

References

- Arka, I W. (2003). Voice systems in the Austronesian Languages of Nusantara: Typology, Symmetricality, and Undergoer Orientation. *Linguistik Indonesia*, 21, 113–139.
- Boas, H. C. (2003). *A Constructional Approach to Resultative*. Stanford: CSLI Publications.
- Boas, H. C. (2008). Determining the structure of lexical entries and grammatical constructions in Construction Grammar. *Annual Review of Cognitive Linguistics*, 6, 113–144. doi: 10.1075/arcl.6.06boa
- Croft, W. (2001). *Radical Construction Grammar: Syntactic theory in typological perspective*. Oxford: Oxford University Press.
- Croft, W. (2009). Connecting frames and constructions: A case study of *eat* and *feed*, *Constructions and Frames*, 1(1), 7–28.
- Deignan, A. (1999). Metaphorical polysemy and paradigmatic relations: A corpus study. *Word*, 50(3), 319–38.
- Fillmore, C. J., Paul K., & O'Connor M. C. (1988). Regularity and idiomaticity in grammatical constructions: The case of 'let alone'. *Language*, 64(3), 501–538. doi: 10.2307/414531
- Goldberg, A. E. (1995). *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.
- Goldberg, A. E. (2002). Surface generalizations: An alternative to alternations. *Cognitive Linguistics*, 13(4), 327–356. doi: 10.1515/cogl.2002.022
- Goldberg, A. E. (2006). *Constructions at work: The nature of generalization in language*. Oxford: Oxford University Press
- Goldhahn, D., Eckart, T., & Quasthoff, U. 2012. "Building Large Monolingual Dictionaries at the Leipzig Corpora Collection: From 100 to 200 Languages" dalam Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC'12), 2012.
- Gries, S. Th. (2017). *Quantitative corpus linguistics with R: A practical introduction* (2nd Edition). New York: Routledge.
- Kroeger, P. (2005). *Analyzing grammar: An introduction*. Cambridge: Cambridge University Press.
- Kroeger, P. (2007). Morphosyntactic vs. morphosemantic functions of Indonesian *-kan*. In A. Zaenen (ed.), *Architectures, Rules, and Preferences: Variations on Themes by Joan W. Bresnan*. Stanford: CSLI. Pp. 229–51.
- Lakoff, G. (1990). The invariance hypothesis: Is abstract reason based on image-schemas? *Cognitive Linguistics*, 1(1), 39–74.
- Lakoff, G. (1993). The contemporary theory of metaphor. In A. Ortony (Ed.), *Metaphor and thought*. Cambridge: Cambridge University Press. Pp. 202–51.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- McDonnell, B. (2016). *Symmetrical voice constructions in Besemah: A usage-based approach* [PhD thesis]. Santa Barbara: University of California, Santa Barbara.
- Perek, F. (2014). Rethinking Constructional Polysemy: The Case of the English Conative Construction. In D. Glynn & J. A. Robinson (Eds.), *Corpus Methods for Semantics: Quantitative Studies in Polysemy and Synonymy*. Amsterdam: John Benjamins Publishing Company. Pp. 57–78.
- Putra, D.S.A. (2026). *cross-paradigmatic-metaphorical-mapping* [Data set and source code]. GitHub. <https://github.com/DerrySAP/cross-paradigmatic-metaphorical-mapping>
- R Core Team. (2025). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>
- Rajeg, G. P. W. (2021). corplngr. *Open Science Framework*. doi: 10.17605/OSF.IO/X8CW4
- Rajeg, G. P. W., & Arka, I W. (2023). Usage-based perspective on argument realisation: A corpus study of Indonesian BUY verbs in applicative construction with *-kan*. *NUSA: Linguistic Studies of Languages in and around Indonesia*, 74, 83–114. doi: 10.15026/0002000019
- Rajeg, G. P. W., Rajeg, I M., & Arka, I W. (2020). *Corpus-based approach meets LFG: Puzzling voice alternation in Indonesian*. figshare. <https://doi.org/10.6084/m9.figshare.12423788.v2>
- Rajeg, I M., Rajeg, G. P. W., & Arka, I W. (2022). Corpus linguistic and experimental studies on the meaning-preserving hypothesis in Indonesian voice alternations. *Linguistics Vanguard*, 8(1), 367–382. doi: 10.1515/lingvan-2020-0104
- Riesberg, S. (2014). *Symmetrical Voice and Linking in Western Austronesian Languages*. Berlin: De Gruyter Mouton.

- Stefanowitsch, A. (2020). *Corpus Linguistics: A guide to the methodology*. Berlin: Language Science Press.
- Turner, M. (1990). Aspects of the invariance hypothesis. *Cognitive Linguistics*, 1(2), 247–55.