

A MORPHOLOGICAL ANALYSIS OF THE INDONESIAN SUFFIXATION: A LOOK AT THE DIFFERENT TYPES OF AFFIXES AND THEIR SEMANTIC CHANGES

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ABSTRACT

This research delved into the complex nature of suffixation in Indonesian morphology, analyzing its crucial role in word formation and semantic variations. The study investigated suffixation patterns, functions, and productivity by scrutinizing a corpus of Indonesian words, i.e., the Indonesian – Leipzig Corpora Collection (ILCC). This exploration used morphosemantics frameworks, two sets of instruments that consisted of verbal construction and noun construction tester, and empirical data to describe suffixation in Indonesian. The results showed that among the various suffixes that shaped the language's grammatical structure, /-kan/ (50,70% with Σ -occurrence: 217,208), /-nya/ (19,53% with Σ -occurrence: 83,648), /-an/ (16% with Σ -occurrence: 68,524), and /-lah/ (7,76% with Σ -occurrence: 33,220) emerged as the most prominent ones. Statistically, the mean value of verb suffixation (5,9) was higher than that of noun suffixation (5,6). Among these, /-kan/ primarily signified causation or transformation of a verb into a transitive verb, while /-nya/ indicated possession, /-an/ transformed verbs into nouns, and /-lah/ added an imperative meaning to the word. In terms of semantic modification and nuances, it has been discovered that suffixes like /-kan/, /-i/, and /-an/ change words' semantic structure in complex ways. The suffix /-kan/, which has a causal or transformational function, modifies the meaning of words by signifying the start of an action. Although /-an/ makes it easier for verbs to become nouns, /-i/ aids in objectification or verbalization. The results of this research brought implications for language description studies.

Keywords: affix; corpus; Indonesian; morphological analysis; semantic changes; suffixation

INTRODUCTION

The Indonesian language is renowned for its rich linguistic diversity, which can be largely attributed to its intricate morphology mechanisms (Nugraha & Baryadi, 2019; Pasaribu & Nugraha, 2020). One of the most important mechanisms is suffixation, which is crucial in word formation (Booij, 2015; Lieber, 2015b) and semantic elaboration (Cançado & Gonçalves, 2016; Lieber, 2011). In order to create new words and express nuanced ideas in Indonesian, suffixation is a valuable technique. Word forms can be changed, vocabulary can grow, and language expressiveness can be improved by adding suffixes to basic words. Semantic meaning extensions, grammatical function modifications, word class transformations, and other semantic alterations are all possible with suffixes. Suffixes have context-dependent semantic and grammatical characteristics that interact with other components of constructions rather than being static. For example, the suffix /-kan/ might have resultative, applicative, or causative meanings, depending on the form in which it occurs. In the causative construction

/membukukan/ ‘to book’, the prefix /-kan/ denotes the agent's cause of the booking action. In other sample, /membelikan/ ‘to buy something for someone’ is an example of an applicative construction that uses /-kan/ to expand the action to include the recipient of the food.

Furthermore, suffixes are essential in determining the structure and meaning of verbal and noun phrases in the Indonesian language. Suffixes serve as grammatical markers, giving words and phrases more meaning and frequently changing their semantic content and grammatical classification. On the one hand, in verbal constructions, suffixes play a vital role in shaping the structure and meaning of verbal constructions, adding layers of grammatical information and semantic nuance to verb forms. These suffixes can modify the verb's aspect, voice, directionality, and formulate complex verb phrases, enabling speakers to express a wide range of actions, relationships, and intentions. Verbal aspect is a prominent area where suffixes exert their influence. For instance, the suffix /-kan/ in Indonesian indicates the resultative aspect, conveying the outcome or completion of the action. Conversely, the suffix /-lah/ marks the imperative aspect, expressing commands or requests. Another important function of suffixes is to indicate the grammatical link between the subject and object of the action. In Indonesian, the suffix /-kan/ is frequently used to form causative verbs, indicating that the action is caused or induced by an agent. Suffixes also influence directionality, which is the movement of an action towards or away from a reference point. In Indonesian, the suffix /-kan/ can be used to indicate movement towards the speaker. Voice, indicating the grammatical relationship between the subject and object of the action, is another area where suffixes play a crucial role. The suffix /-kan/ in Indonesian is often used to create causative verbs, emphasizing that the action is caused or induced by an agent. Directionality, the movement of the action towards or away from a reference point, is also affected by suffixes. In Indonesian, the suffix /-kan/ can mark verbs of motion, indicating movement towards the speaker.

On the other hand, suffixes have an essential role in determining the structure and meaning of noun formations in the noun constructions. They help to construct and modify nouns, allowing us to communicate a wide range of thoughts and relationships. Suffixes can change verbs into nouns, turning actions into concepts. In Indonesian, the suffix /-an/ converts the verb /makan/ ‘to eat’ into the noun /makanan/ ‘food’. Suffixes can also be used to form adjectives from nouns or verbs, conveying the qualities or attributes associated with those terms. The suffix /-an/ changes the noun /rumah/ ‘house’ to the adjective /rumahan/ ‘homely’, and the verb /buat/ ‘to make’ to the adjective /buatan/ ‘made’. Also, suffixes can show possessive relationships, connecting a possessor to a possessed term. In Indonesian, the suffix /-nya/ indicates possession, as seen in /bukunya/ ‘his/her book’. Lastly, suffixes can be used to produce locative nouns, which denote places or locales related to the activity or thought indicated by the root word. In Indonesian, the suffix /-an/ converts the verb /ujar/ ‘to speak’ into the noun /ujaran/ ‘speech’.

PROBLEM STATEMENT

Previous studies on Indonesian morphology's affixation have expanded our understanding of affixation processes and patterns. In terms of affixation patterns, Chaer (2008) and Kridalaksana (2009) conducted in-depth analyses of Indonesian affixation patterns, emphasizing the affixes' function in word creation. Second, in terms of morphology and semantic shifts, the field of Indonesian morphology has been extensively studied by experts such as Arka & Manning (1998), Isodarus (2023), and Sneddon (1996). These studies have focused on the derivational aspects of the language, particularly the semantic shifts induced by suffixes. Third, in terms of semantic considerations, research conducted by Nugraha (2021, 2022, 2023) on the morphosemantic aspects of affixation in Indonesian has brought to light the subtleties inherent in the language's morphological structure by demonstrating the impact of

affixes on meaning in various grammatical contexts. Lastly, in terms of corpus-based studies and computational analyses, to examine morphological processes in Indonesian, more recent studies have embraced corpus-based and computational methods, as demonstrated by the work of Amalia et al. (2021), Denistia & Baayen (2022), and Muljono et al. (2017). These researches added actual data to support theoretical frameworks by using quantitative approaches to examine the frequency, distribution, and usage trends of morphemes. In short, Indonesian morphology studies have provided valuable information about affixation processes' systematic nature and semantic shifts. This information serves as an essential starting point for further research. Despite the availability of significant literature on the subject, avenues of suffixation in Indonesian morphology still need to be explored.

Even though some studies have been conducted on different aspects of Indonesian morphology, a comprehensive analysis focusing specifically on suffixation still needs to be completed (Schmid, 2015; Stekauer et al., 2012). Therefore, the main objective of this study is to investigate the multifaceted nature of suffixation and its influence on the structural fabric of the language. We employed a combination of empirical data, linguistic frameworks, and theoretical perspectives to achieve this objective. This study seeks to elucidate the mechanics of suffixation, explore its implications for language usage. Therefore, the research questions are as follows: (1) which affix forms are used in Indonesian suffixation; in the grammatical context of verb and noun construction, what is the frequency distribution of these affixes; and (2) what function do affixes serve in suffixations that change the manner in which Indonesian word formations are grammatically recognized?

LITERATURE REVIEW

The morphology of the Indonesian language is an area of linguistics that numerous theoretical perspectives and frameworks have significantly enriched. Among these, the study of suffixation has played a significant role (cf. Dal & Namer, 2015; Plag, 2020). First, morphological theory. Morphology is a fundamental aspect of linguistics that explores the structure and formation of words (Bauer, 2019a). Its theoretical underpinnings provide a framework for understanding how morphemes contribute to word formation (Stump & Finkel, 2013). Classical morphological theories, such as structuralism (Motsch, 2015) and generative grammar (Lieber, 2015b) offer insights into the structural aspects of suffixation. Structuralism focuses on the form and distribution of morphemes in language, while generative grammar emphasizes the rules and processes that govern language production.

Second, affixation and word formation. The study of affixation processes, which includes suffixation, is an essential aspect of linguistics. It involves an in-depth exploration of how various affixes combine with roots to create new words and how they alter the meaning of the base word (Štekauer, 2015). This field of study is known as derivational morphology (Kotowski & Plag, 2023; Lieber et al., 2015) and provides a solid foundation for understanding the Indonesian language's productivity, patterns, and semantic shifts induced by suffixation. Third, the semantics of suffixation. Studying suffixes in the Indonesian language and their correlation with semantic nuances is a crucial area of investigation. Through applying semantic theories and frameworks (Haspelmath, 2003), one can gain a deeper understanding of how suffixes modify meaning in the language. These modifications can include changes in aspect, mood, and other semantic dimensions that shape the way the language is used (Aikhenvald & Dixon, 2011; Heusinger et al., 2011).

Lastly, the corpus-based approach. In recent years, significant advancements in corpus linguistics method have paved the way for empirical investigations into language phenomena (Gries, 2015; Gries & Paquot, 2020). These studies allow for the quantitative analysis of the frequency, distribution, and usage patterns of suffixes in the Indonesian language. Corpus-

based approach, however, aid in analyzing the complex linguistic processes involved in suffixation (O’Keeffe & McCarthy, 2022). In summary, this theoretical framework is essential for thoroughly analyzing suffixation within Indonesian morphology.

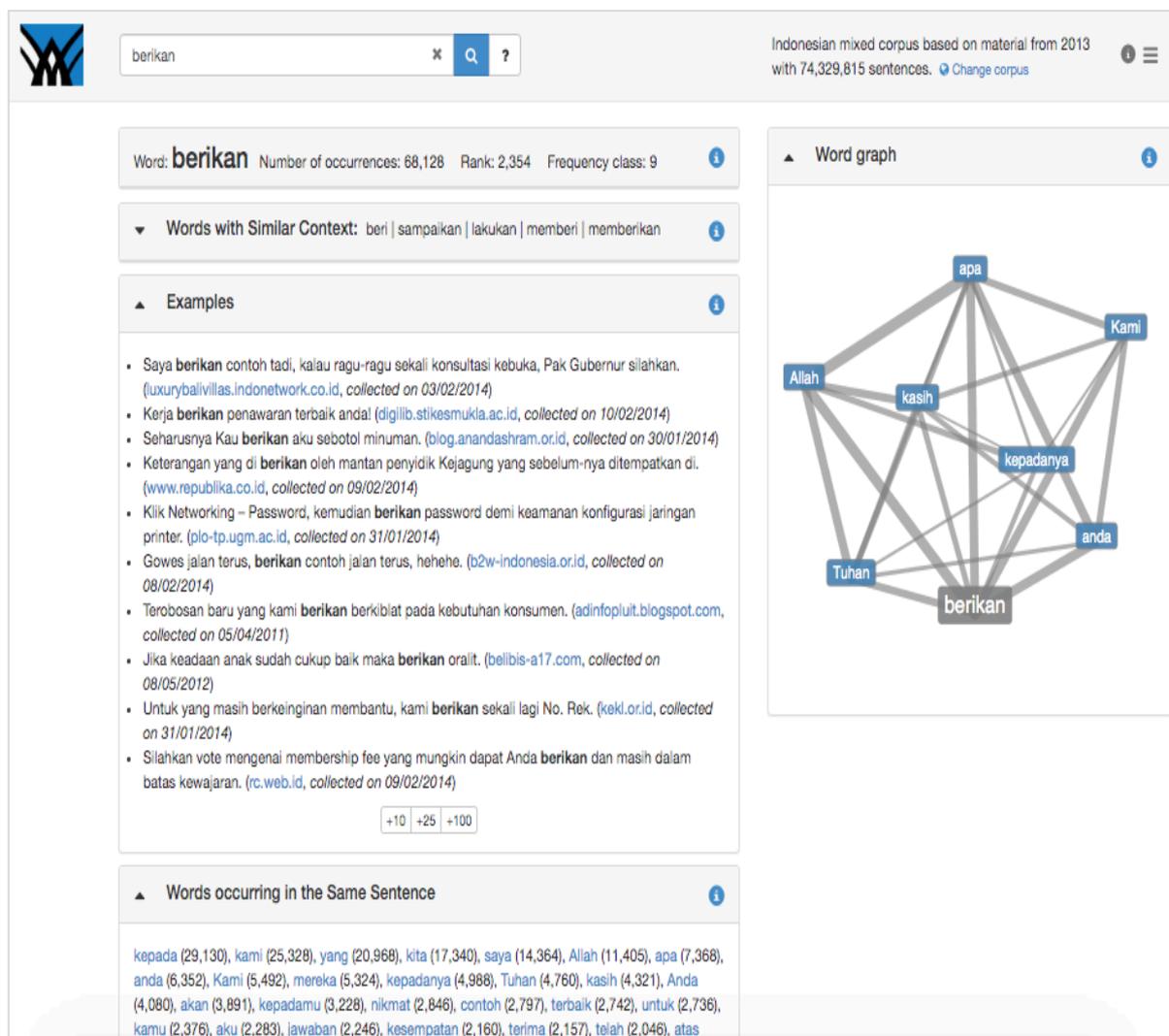


FIGURE 1. The Indonesian – Leipzig Corpora Collection (ILCC)

METHOD

THE CORPUS AND DATA COLLETION

This study used morphology investigation and quantitative examination to analyze suffixation in Indonesian morphology. In the first stage, a corpus selection, data extraction, and data annotation were carried out. A detailed corpus of Indonesian texts covering a wide range of genres and registers was selected, i.e., the Indonesian – Leipzig Corpora Collection (ILCC) (website: https://corpora.uni-leipzig.de/en?corpusId=ind_mixed_2013). The ILCC is an Indonesian mixed corpus based on material from 2013. It contains 74,329,815 sentences and 1,206,281,985 tokens (Figure 1). Subsequently, an automated process as illustrated in Figure 2 (this procedure has been done by using the UDPipe; a trainable pipeline for tokenization, tagging, lemmatization and dependency parsing (the service can be accessed via website: <https://lindat.mff.cuni.cz/services/udpipe/>) and manual annotation extracted words featuring

suffixes from the corpus. This process ensured that the extracted data was accurate and reliable and that all relevant words were captured. Each word was annotated with its respective suffix, root, part of speech, and contextual information to facilitate in-depth analysis.

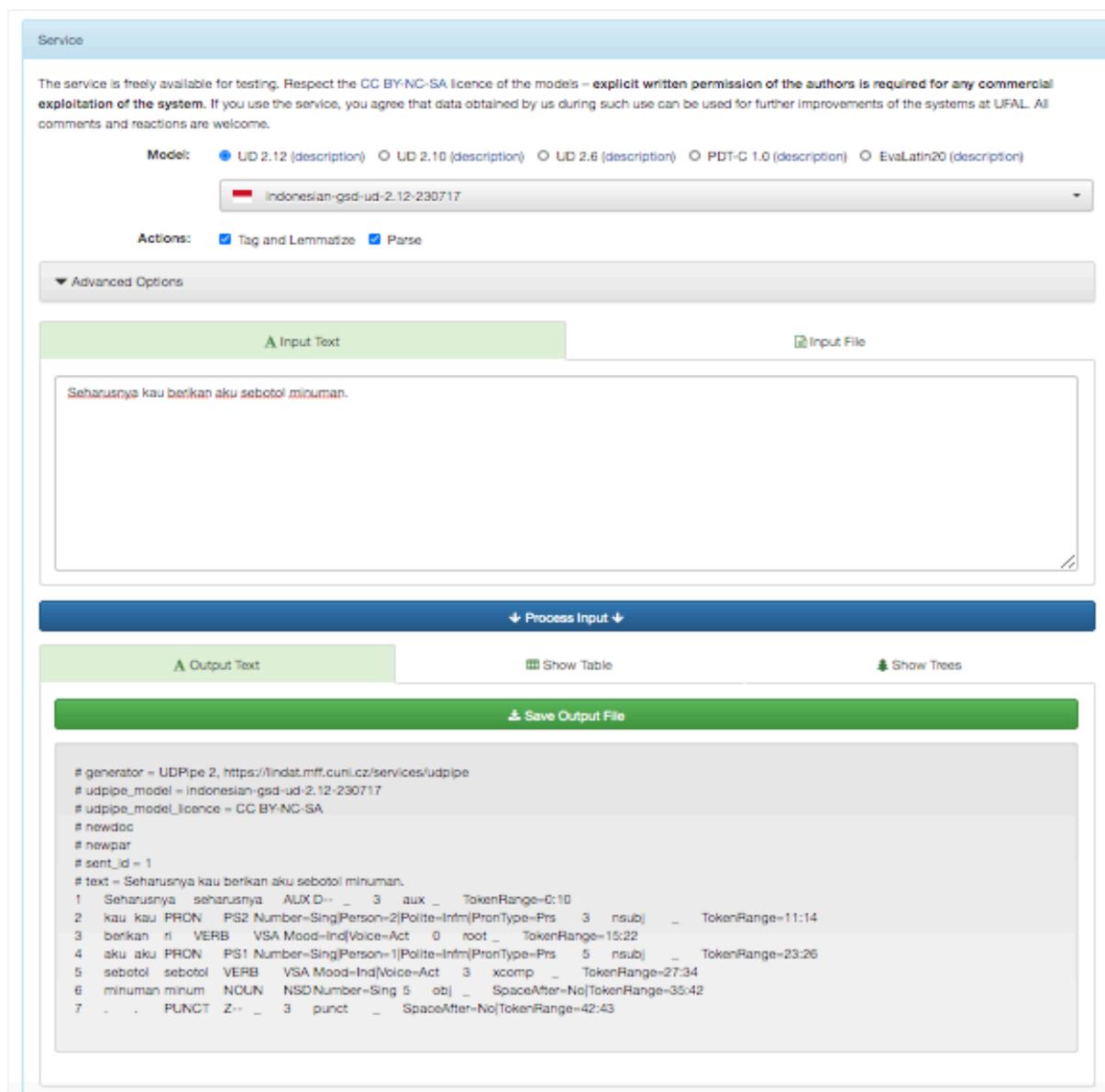


FIGURE 2. Visualization of Automatic Tokenization and POS-Tagging

DATA ANALYSIS

In the second step, a quantitative analysis based on morphology and semantics instruments was carried out. The instruments were the (a) sets of verb categorization and (b) sets of noun categorization; the instruments developed by utilizing the theory of nuclear verbs (Viberg, 1983; Viberg, 2014) and the theory of universal semantic parameters for noun categorization (Aikhenvald, 2006, 2017, 2020). By analyzing the frequency of occurrence and the contexts in which these suffixes were used, the researcher aimed to determine their productivity and distribution across two different linguistic contexts. Then, to gain a deeper understanding of suffixation's role in the language, the study also conducted an in-depth qualitative analysis of the semantic nuances and functional aspects of suffixation. The final stage involved validating

findings on Indonesian morphology using quantitative linguistic analysis, utilizing the Kruskal-Wallis test, and cross-referencing them with existing theories to ensure accuracy. Insights from related disciplines, i.e., syntax and semantics, were also considered for a comprehensive understanding.

TABLE 1. Summary of the Occurrences throughout Indonesian Suffixes

Suffixes	Grammatical Context		Σ	(%)	Rank
	Verbal construction	Noun construction			
/-kan/	118,073	99,235	217,208	50,74	1
/-i/	4,664	37	4,701	1,10	7
/-nya/	36,402	47,246	83,648	19,53	2
/-ku/	2,355	983	3,338	0,78	8
/-lah/	32,192	1,028	33,220	7,76	4
/-kah/	6,880	9	6,889	1,61	6
/-mu/	843	610	1,453	0,34	9
/-wan/	0	8,017	8,017	1,87	5
/-wati/	0	22	22	0,01	12
/-wi/	0	0	0	-	-
/-al/	0	0	0	-	-
/-an/	62,428	6,096	68,524	16	3
*/-ken/	13	7	20	0	13
*/-itas/	0	0	0	-	-
*/-onal/	0	0	0	-	-
*/-in/	837	263	1,100	0,26	10
*/-isasi/	0	24	24	0,01	11
TOTAL	264,687	163,577	428,264	100	

Notes:

1. The grammatical context as the experiment's environment has been developed by utilizing two sets of words, i.e., according to the theory of Nuclear Verbs (Viberg, 1983) and the theory of universal semantic parameters for noun categorization (Aikensvald, 2006).
2. The asterisk symbol (*) indicates the Indonesian language's colloquial suffix and the naturalized suffix (from English).

RESULTS

THE SUFFIXES

In terms of the identification of dominant suffixes, the findings of the corpus analysis conducted on Indonesian morphology showed that a set of suffixes, namely /-kan/ such as in /berikan/ 'give', /-nya/ such as in /rakyatnya/ 'her/his/their people', /-an/ such as in /buatan/ 'made', and /-lah/ such as in /datanglah/ 'to come-IMPERATIVE', are the most commonly used ones. These suffixes were observed to be present across different sentences included in the corpus (see Table 1), indicating their widespread usage in the Indonesian language (see Table 2). On the other hand, in terms of the productivity ranking, it has been found that among all the analyzed suffixes, /-kan/ (Σ -occurrence: 217,208) was observed to be the most productive one, followed by /-nya/ (Σ -occurrence: 83,648), /-an/ (Σ -occurrence: 68,524), and /-lah/ (Σ -occurrence: 33,220). These suffixes have shown a higher frequency and versatility in their ability to form new words or modify the meanings of existing ones, either in verbal construction (see Table 3) or in noun construction (see Table 4).

TABLE 2. Descriptive Statistic of Suffixation in the Verb and Noun Constructions

N	Verb Suffixation		Noun Suffixation	
	Valid	Missing	Valid	Missing
	10	7	13	4
Mean	5,9		5,6	
Median	0,3		0,02	
Mode	0		0	
Sample Variance	144,1		249,81	
Std. Deviation	12		15,81	
Std. Error	2,9		3,83	
Confidence level (95%)	6,2		8,13	

Moreover, the analysis unveiled the following significant findings. First, the suffix /-kan/. The suffix /-kan/ emerged as the most frequently used and versatile suffix within the corpus. This suffix's multifunctional usage spanned across various linguistic contexts, indicating its broad applicability. When used with verbs, consider the example (1), /-kan/ often signifies transformation, causation, and transitivity. Sentence (1) implies causality as it uses the predicate /berikan/ 'give' where the subject performs an action for the object or patient. This causative meaning is achieved through the process of suffixation, which transforms /beri/ 'to give' into its causative form, /berikan/ 'give'. Regarding morphosyntax of the sentence, transitivity is added to the root morpheme during affixation, resulting in three arguments: one in the subject and two in the first and oblique objects.

(1) *Seharusnya kau berikan aku sebotol minuman* (ILCC, 2013).

Seharusnya-AUX kau-PRON berikan-VERB aku-PS1 sebotol-NOUN minuman-NOUN
 'You should give me a bottle of drink.'

Second, the suffix /-nya/. In Indonesian, possession or belonging can be conveyed through possessive suffixes. The most commonly used suffix for this purpose is /-nya/, which indicates that something belongs to or is associated with someone or something else. For example, consider sentence (2), which has the construction /rakyatnya/ 'his people'. This construction shows the meaning of ownership represented by /the people/ after experiencing suffixation with /-nya/. Additionally, when referring to possession in the context of the first-person singular, the suffix /-ku/ is used. These suffixes are widely used in Indonesian to express ownership or association with various people, objects, or ideas; especially in the noun construction.

(2) *Kepala negara ingin Indonesia menang, seperti juga ratusan juta rakyatnya* (ILCC, 2013).

Kepala-NOUN negara-NOUN ingin-AUX Indonesia PROPN menang-VERB seperti-ADP juga-ADV
 ratusan-NOUN juta-NOUN rakyat-NOUN nya-PS3
 'The head of state wants Indonesia to win, as do hundreds of millions of his people.'

(3) *Lilin buatan Danang memang terlihat sederhana* (ILCC, 2013).

lilin-NOUN buatan-NOUN Danang-PROPON memang-ADV terlihat-VERB sederhana-ADJ
 'Candles made by Danang do look simple.'

Third, the suffix /-an/. Adding the /-an/ suffix is paramount when converting verbs into nouns. Its usage is not limited to nominalization but also denotes collectivity, abstract concepts, or spatial relations. For instance, consider the /buatan/ as an example (3). The verb /buat/ 'to make' has been converted into /buatan/ 'made' after the suffixation by using the /-an/. The

prevalence of this suffix in the language suggests its crucial role in creating innovative vocabulary and broadening the lexicon, i.e., the total occurrence for the verbal construction is 62,428 times and for the noun construction is 6,096 times.

- (4) *Karenanya, datanglah kepada-Nya manakala kesulitan datang mendera* (ILCC, 2013).
 Karenanya-SCONJ datanglah-VERB nya-PRON manakala-SCONJ kesulitan-NOUN datang-VERB mendera-NOUN
 ‘Therefore, come to Him when difficulties come to whip.’

Lastly, the suffix /-lah/. The morpheme /-lah/ is commonly used in verbal constructions, especially in the imperative mood. It is typically added to the end of a verb, as in the construction /datanglah/ in a sentence (4), to express a sense of urgency or insistence in the described action. Morphosemantically, this affixation adds an imperative meaning to the word /datang/ ‘to come’, conveying a command or request for the listener to come to a specific location. In general, /-lah/ is a crucial linguistic tool in the Indonesian grammar, enabling speakers to communicate specific nuances and meanings in their speech.

TABLE 3. Suffix Types and Frequency in Verbal Constructions

Suffixes	Reflection of the universal tendencies: nuclear verbs									Σ
	I		II		III	IV	V	VI	VII	
	A	B	C	D	E	F	G	H	I	
/-kan/	2	2,187	68,128	615	2,475	8,887	89	880	34,810	118,073
/-i/	4	4,146	4	5	7	4	14	69	411	4,664
/-nya/	1,726	21,531	32	203	1,579	4,918	440	3,906	2,067	36,402
/-ku/	2	4	86	0	1,912	128	1	132	90	2,355
/-lah/	3,766	8,225	4,879	1,918	5,662	552	5,363	1,809	18	32,192
/-kah/	3	16	7	1	2	0	14	6,727	110	6,880
/-mu/	3	13	22	0	624	127	1	33	20	843
/-wan/	0	0	0	0	0	0	0	0	0	0
/-wati/	0	0	0	0	0	0	0	0	0	0
/-wi/	0	0	0	0	0	0	0	0	0	0
/-al/	0	0	0	0	0	0	0	0	0	0
/-an/	5	58	51	154	60,944	11	11	1,106	88	62,428
*/-ken/	0	0	7	1	0	4	0	0	1	13
*/-itas/	0	0	3	0	0	0	0	0	0	0
*/-onal/	0	0	0	0	0	0	0	0	0	0
*/-in/	3	116	4	116	311	119	97	62	9	837
*/-isasi/	0	0	0	0	0	0	0	0	0	0

Notes:

1. Code for the stem

A: /pergi/ ‘to go’

B: /datang/ ‘to come’

C: /beri/ ‘to give’

D: /ambil/ ‘to take’

E: /buat/ ‘to make’

F: /bicara/ ‘to say’

G: /lihat/ ‘to see’

H: /tahu/ ‘to know’

I: /ingin/ ‘want’

2. Code for the cluster

I: Motion

II: Possession

III: Production

IV: Verbal Communication

V: Perception

VI: Cognition

VII: Desire

Additionally, the research noted unproductive suffixes in Indonesian verbs and nouns. Four affixes – /-wi/, /-al/, /-itas/, /-onal/ – were found to be not used in either of these contexts of instruments. However, manual searches reveal their presence in the Indonesian language. Suffix /-itas/ as in /rasionalitas/ ‘rationality’, which is derived from /rasional/; creating the formation of a noun derived from an adjective. Suffix /-onal/ as in /redaksional/ ‘editorial’

derived from /redaksi/; forming an adjective derived from a noun. Besides, the linguistic element /-wi/ is used to create adjectives from nouns, as seen in words like /kimiawi/ ‘chemical’ from /kimia/. Similarly, the morpheme /-al/ is another common way to form adjectives from nouns, as seen in words like /praktikal/ ‘practical’ from /praktik/. These adjectives often convey a sense of belonging or association with the noun. It is worth noting that /-wi/ and /-al/ have specific grammatical functions and are exclusively used to form adjectives. They are not used to form verbs, which can be a valuable tool for understanding the meaning and function of words within a sentence.

In summary, the Indonesian language heavily relies on suffixes to modify words, transform verbs into nouns, and add specific nuances to the language. The commonly used suffixes in Indonesian morphology are /-kan/, /-nya/, /-an/, and /-lah/. The /-kan/ suffix indicates the causative aspect of a verb, while the /-nya/ suffix shows the possessive aspect of a noun. The /-lah/ suffix expresses a sense of urgency or insistence in the described action. Finally, the /-an/ suffix is utilized to denote a verb's nominalization or indicate a location or direction. Proper use of these suffixes is essential to accurately convey the intended meaning in Indonesian.

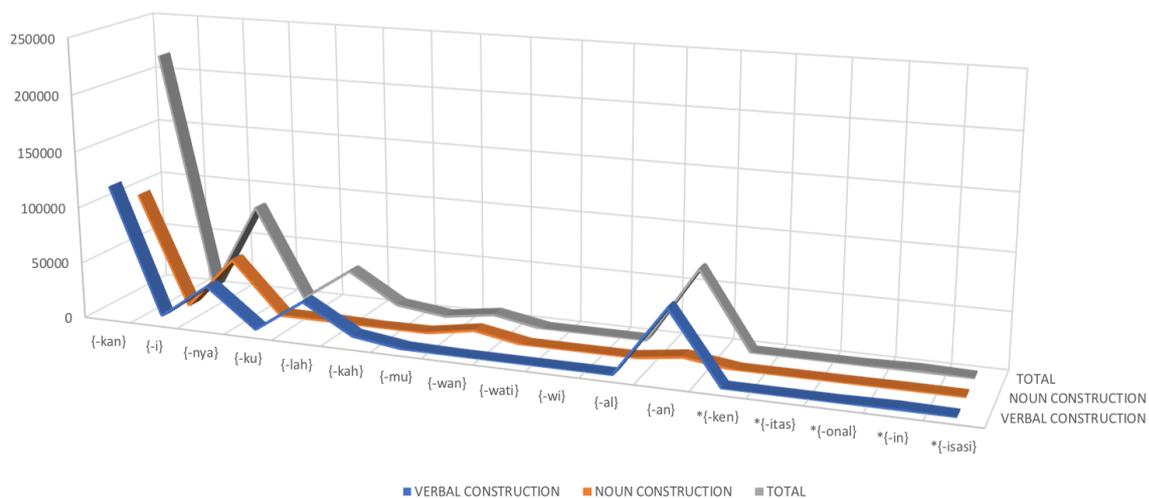


FIGURE 3. Comparison of Suffixation Occurrences in Word Structures

WORD MEANINGS

Suffixes play a crucial role in Indonesian morphology by modifying word meanings and changing their classes. They are an integral part of the language's grammatical structure and significantly affect the semantic nuances of words. Suffixes are instrumental in transforming verbs into nouns and vice versa, expanding the language's vocabulary by creating new word forms with specific meanings and functions. This ability of suffixes to modify and transform words has made them an essential component of the Indonesian language, as they appear in both verbal and noun construction contexts, as depicted in Figure 3.

On the one hand, regarding the semantic modification, the Indonesian language is known for its rich and complex system of suffixes. A qualitative analysis of these suffixes has revealed that they introduce a variety of semantic nuances to the language. For example, the suffix /-kan/ often indicates causation or transformation, implying that the action of the verb is being done to something or someone else. This suffix is commonly used to create transitive verbs, indicating that a subject is causing something to happen to an object.

On the other hand, concerning the word class alteration, one exciting aspect of the Indonesian language is suffixing's role in altering word classes. When a suffix is added to a word, it can completely change its meaning and function within a sentence. For example, adding the suffix /-an/ frequently transforms verbs into nouns, enriching the language with a diverse array of nominal forms. This addition not only adds to the complexity but also allows for more precise and nuanced sentences.

TABLE 4. Types of Suffixes and Their Frequency in the Usage of Noun Constructions

Suffixes	The parameters of noun classes												Σ
	I		II		III		IV		V		VI	VII	
	A	B	C	D	E	F	G	H	I	J	K	L	
/-kan/	0	0	0	4	0	0	0	17	36	6	3	99,169	99,235
/-i/	1	1	0	4	1	2	0	1	21	0	0	6	37
/-nya/	19,652	484	264	7,386	1,192	3,083	194	478	2,262	615	39	11,597	47,246
/-ku/	210	18	11	453	40	149	2	5	82	12	0	1	983
/-lah/	645	4	3	23	67	205	1	2	20	8	0	50	1,028
/-kah/	5	0	0	0	0	0	0	0	1	1	0	2	9
/-mu/	193	22	6	303	3	48	4	4	23	2	0	2	610
/-wan/	0	0	0	7,742	0	0	0	0	0	0	0	275	8,017
/-wati/	0	0	0	22	0	0	0	0	0	0	0	0	22
/-wi/	0	0	0	0	0	0	0	0	0	0	0	0	0
/-al/	0	0	0	0	0	0	0	0	0	0	0	0	0
/-an/	4	5	26	18	0	0	0	94	102	5,189	3	655	6,096
*/-ken/	0	0	0	0	0	0	0	0	0	0	0	7	7
*/-itas/	0	0	0	0	0	0	0	0	0	0	0	0	0
*/-onal/	0	0	0	0	0	0	0	0	0	0	0	0	0
*/-in/	0	0	0	0	0	0	0	4	6	1	0	252	263
*/-isasi/	0	0	0	0	0	0	0	0	0	24	0	0	24

Note:

1. Code for the stem

A: /rakyat/ 'the people'
 B: /arwah/ 'spirit'
 C: /ratu/ 'princess'
 D: /bangsa/ 'nation'

E: /pria/ 'male'
 F: /wanita/ 'female'
 G: /lingkaran/ 'circle'
 H: /kotak/ 'square'

I: /merah/ 'red'
 J: /kuning/ 'yellow'
 K: /ajeg/ 'steady'
 L: /guna/ 'function'

2. Code for the cluster

I: Humannes
 II: Animacy
 III: Gender

IV: Shape
 V: Form
 VI: Consistency

VII: Functional Properties

Furthermore, as per the findings of the Kruskal-Wallis test, as detailed in Table 5, it has been observed that the alteration of word meanings is significantly impacted by the process of suffixation. This test has resulted in identifying the precise degree or value of differences among the various suffixes that were listed in the two experiments, both in the verbal construction and noun construction.

The test is mainly used to test two groups of hypotheses, namely the verbal construction group and the noun construction group. In the verbal group, the hypothesis formulations are (a) H₀: There are no significant differences in the realization of verbal construction in the suffixation context and (b) H₁: There are significant differences in the realization of verbal construction in the suffixation context. Meanwhile, in the noun group, the hypothesis formulations are (a) H₀: There are no significant differences in the realization of noun construction in the suffixation context and (b) H₁: There are significant differences in the realization of noun construction in the suffixation context. The test statistic for the Kruskal-Wallis test, designated as H, has the following definition:

$$(5) H = \left(\frac{12}{N(N+1)} \sum_{j=1}^k \frac{R_j^2}{n_j} \right) - 3(N+1)$$

where N is the overall sample size, n_j is the sample size in the j^{th} group, R_j is the sum of the ranks in the j^{th} group, and k is the number of comparison groups.

TABLE 5. The Statistically Significant Difference Between the Affixes of Indonesian Suffixation

Grammatical Context	Asymptotic Significance	Accepted Hypothesis
Category 1: Verbal Construction	0,01	There are significant differences in the realization of verbal construction in the suffixation context.
Category 2: Noun Construction	0,01	There are significant differences in the realization of noun construction in the suffixation context.

Notes:

1. The Kruskal-Wallis test has been performed by utilizing the SPSS 27. This test is mainly to support the qualitative analysis on semantic role of affixes in suffixation.
2. The statistical test is a method for comparing differences between multiple independent groups. When the test reveals a significant difference between groups, it implies that one sample group has a higher median value than another. The group difference is statistically significant when the asymptotic significance value is less than 0.05, indicating a low likelihood of obtaining such a result by chance. Therefore, the observed difference is likely due to the independent variable being studied.

In the verbal construction, the /-kan/ in Indonesian is a versatile suffix commonly used to indicate causation or transformation in verbs. When added to a verb, it transforms the original verb into a causative verb, indicating that the sentence's subject is causing the action to happen. For example, sentence (6), the verb /bicara/, which means 'to say', can be transformed into /bicarakan/, which means 'to make someone say something'. In this case, adding the /-kan/ suffix indicates that the sentence's subject is causing someone else to say something. This suffix can be added to a wide variety of verbs to create new words with different meanings.

(6) *Sung Ra, ada hal yang perlu aku **bicarakan** denganmu* (ILCC, 2013).

Sung Ra-PROPN ada-VERB hal-NOUN yang-CONJ perlu-VERB aku-PRON bicarakan-VERB denganmu-ADP

‘Sung Ra, there's something I need to talk to you about.’

In addition, the structure of Indonesian language features a unique grammatical construction involving suffixes to transform nouns into verbs. One suffix is /-kan/, critical in this transformation process. Adding to a noun changes the word's meaning from a static concept to an action-oriented one. For example, sentence (7), consider the noun /guna/, which means 'function'. When the suffix /-kan/ is added to it, it changes to /gunakan/, which now means 'to function'. This change reflects a shift from a noun representing a state or object to a verb denoting an action. Thus, the suffix /-kan/ is a useful tool for creating dynamic verbs from otherwise static nouns.

(7) *Atau lebih baik lagi, **gunakan** headphone peredam suara* (ILCC, 2013).

Atau- CON- lebih-ADV baik-ADJ lagi-ADV gunakan-VERB headphone- NOUN peredam-NOUN suara-NOUN

‘Or better yet, use noise-cancelling headphones.’

Semantic change is a process in language where a word's meaning changes over time. One such process is called nominalization, which involves turning a verb into a noun. This semantic change can be done by adding the /-an/ suffix to the base verb or other word forms. The resulting noun usually represents a concrete object or concept related to the original action or process. For example, sentence (8), the verb /buat/, meaning 'to make', can become /buatan/, which means 'made'. The /-an/ suffix is often used to show collectivity, abstract concepts, or spatial relations and is frequently associated with food-related nouns.

(8) *Mobil **buatan** Eropa menyudahi hegemoni Jepang* (ILCC, 2013).

Mobil-NOUN buatan-NOUN Eropa- PROPN menyudahi-VERB hegemoni- NOUN Jepang- PROPN
'European-made cars ended Japanese hegemony.'

A notable finding has been made about the semantic role of the suffix /-i/ and its ability to change the meaning of words. Although not highly used, /-i/ can indicate the objectification or verbalization of a noun, leading to a change in meaning. The use of the /-i/ suffix in the construction of /merahi/ 'reddden', as seen in (9), is particularly noteworthy. In this context, the noun /merah/ has been transformed into /merahi/ by adding the /-i/ suffix. This suffix verbalizes the noun and gives it an imperative meaning, instructing someone to colour something red. This demonstrates the impact of the /-i/ suffix in modifying the meaning of words and its potential influence on sentence structure and communication.

(9) *Tolong **merahi** baris kalimat ini* (ILCC, 2013).

Tolong- PROPN merahi-VERB baris-NOUN kalimat-NOUN ini-DET
'Please give this line (of sentence) a red color.'

In summary, suffixes are essential in modifying word meanings and altering word classes. Adding specific suffixes to verbs can transform them into nouns, indicating actions or processes. This process helps introduce new lexical items with distinct semantic nuances, thus making the language more expressive and versatile. These suffixes add meaning and help in understanding the context in which the words are used. Some common suffixes used in Indonesian include /-kan/, /-nya/, /-an/, and /-lah/. This way, using suffixes helps make the language more nuanced and refined.

DISCUSSION

THE TYPES OF AFFIXES IN INDONESIAN SUFFIXATION

The research findings have shed light on the significant role of specific suffixes in Indonesian morphology. Among the various suffixes that shape the language's structural landscape, /-kan/, /-nya/, /-an/, and /-lah/ emerged as the most prominent ones. The study highlighted the productivity of the /-kan/ suffix, which is used extensively to create new words and modify the semantics of existing ones. The suffixes /-nya/ and /-an/ also play a significant role in word formation and semantic modification, indicating their importance in Indonesian. The multifunctional nature of these suffixes underscores their significance in Indonesian morphology and their contribution to the language's richness and complexity (cf. Fuentes, 2024; Nugraha, 2017).

In terms of the dominance of key suffixes, according to the study, the most common and adaptable suffixes in Indonesian are /-kan/, /-nya/, /-an/, and /-lah/. These suffixes became primary linguistic tools that greatly influenced word construction and meaning changes. These suffixes are ubiquitous in a variety of linguistic contexts. According to Ribbens-Klein (2023),

as a morphological affix, the suffix is crucial in forming novel words. As Dressler & Ransmayr (2023) claimed, in the context of inflective languages, i.e., Austrian Standard German, suffixes also play a similar role in the process of creating new words. Voeikova (2023) also reported that suffix behavior in the grammatical context tends to be a catalyst for new word formation occurs even in the Russian colloquial language.

In terms of the productivity and functional versatility of the suffixes that were found, /-kan/ was the most productive. It was found to be quite versatile when applied to verbs, meaning that it might indicate transitivity, transformation, or causality. Furthermore, the productive /-an/ and unproductive /-i/ demonstrated their flexibility in nominalization, and verbalization, respectively. These suffixes' versatile nature reflects the vital contributions they have made to Indonesian's linguistic productivity. According to Parshina & Puzynina (2024), productivity, a linguistic concept, can be assessed through finite and infinite approaches, further classified as open and closed paradigms. In closed paradigms, words are formed by adding affixes and suffixes, while in open paradigms, words are used without any such modification. As Gabric (2024) claimed, closed one is the bordered one, and the open one is the unbordered one.

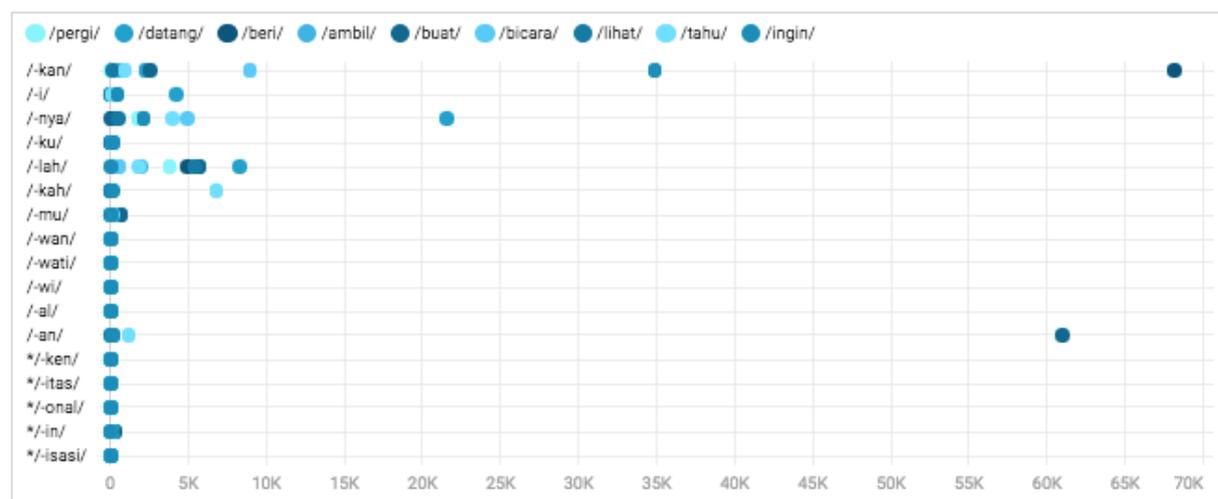


FIGURE 4. Suffixation in the Verbal Constructions

In terms of the semantic and lexical expansion, these suffixes introduce semantic alterations that are essential to the expansion of the language's lexicon. The suffix /-kan/, for example, changes verbs into causative forms or denotes a shift in the action or state. Suffix /-i/ indicates objectification or verbalization, whereas /-an/ makes it easier for verbs to become nouns and adds a variety of nominal forms to the language. According to Bauer (2019b), semantic expansion in morphology is the process of giving words or morphemes that already exist additional meanings. On the other hand, the process of introducing new words to a language is known as lexical expansion. As Fejes (2023) claimed, lexical expansion can occur not only when suffixes from the internal system of the language are used, but also from systems outside the language.

Moreover, using suffixes in language is crucial to grammatical rules. In Indonesia, the frequency and patterns of using suffixes reflect both the grammatical standards and the linguistic occurrences of the language. The language's linguistic structure is shaped by the grammatical effects, which indicates the dynamic interaction between language usage and structural circumstances. According to Lieber (2015a) suffixes contribute to word construction, part-of-speech shifts, grammatical linkages, and effective word creation, which makes them essential to grammatical rules. As Dressler et al. (2023) claimed, suffixes play a vital function in all languages.

THE SUFFIXES AND THEIR PIVOTAL ROLE

In the Indonesian language, suffixes have been found to play a crucial role in modifying the meanings of words and transforming their grammatical classes. The four most commonly used suffixes in Indonesian are /-kan/, /-nya/, /-an/, and /-lah/. Among these, /-kan/ primarily signifies causation or transformation of a verb into a transitive verb. On the other hand, /-an/ transforms verbs into nouns. These suffixes have remarkable semantic versatility and facilitate the creation of new words by attaching them to the existing roots. Moreover, they allow for the transformation of verbs into nouns and the vice versa. Thus, using these suffixes is one of the most significant aspects of Indonesian grammar and its lexical expansion (cf. Nugraha, 2024b; Meinschaefer, 2023).

The study of suffixation in Indonesian morphology has shed light on suffixes' significant influence on word meanings and word classes. This process is a crucial aspect of the language, allowing for a nuanced expression of ideas and concepts. According to Cassio (2023), suffixes are morphological parts that can be fundamental in the context of discourse markers. As Stefanowitsch & Middeke (2023) claimed, the meaning produced through suffixation is a logical consequence of the spectrum of meanings that can emerge from morphological probability distributions.

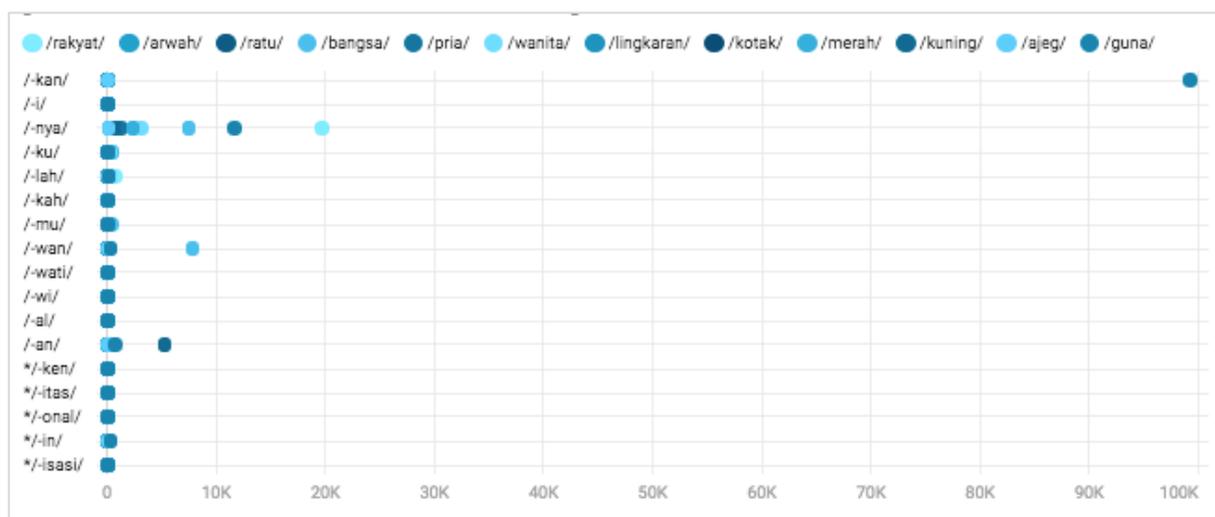


FIGURE 5. Suffixation in the Noun Constructions

In terms of the semantic modification and nuances, it has been discovered that suffixes like /-kan/, /-i/, and /-an/ change words' semantic structure in complex ways. The suffix /-kan/, which has a causal or transformational function, modifies the meaning of words by signifying the start of an action. Although /-an/ makes it easier for verbs to become nouns, /-i/ aids in objectification or verbalization. According to Lieber (2001), suffixation is a very effective approach to generate new words for a variety of reasons. For instance, words like /treatment/ that indicate the outcome of an action are frequently formed with the suffix /-ment/. As Nagano (2023) claimed, semantic change occurs naturally in all languages and can happen at any time.

In terms of the alteration of word classes, one notable result of suffixation was the modification of word classes. Nouns were easily generated from verbs, expanding the vocabulary of the language. This process made easier by suffixes like /-an/ and /-i/, allows the language to convey ideas, actions, or entities in a variety of ways, increasing its expressiveness. According to Manova (2011), suffixes can alter a word's grammatical purpose. For instance,

an adjective can become an adverb by adding the suffix /-ly/, as in the cases of /quickly/ and /sadly/. As Borer (2017) claimed, this is because suffixation is a relatively simple and efficient way to create new words.

In terms of lexical expansion, suffixes were essential in helping the language acquire more vocabulary since they made it possible to create new words and give them more complex meanings. This suffixation-driven vocabulary expansion adds to the language's adaptability by enabling the articulation of a wide range of thoughts, ideas, and behaviors within Indonesian morphology. According to Bauer et al. (2015), suffixation is a relatively prevalent way to produce new words in English. As Körtvélyessy et al. (2020) claimed, there is a creative tendency in all languages, whether a language is agglutinative or inflectional.

In terms of the functional adaptability in communication, suffixes' functional flexibility modifies word meanings and adapts them to different language settings, facilitating accurate communication. This flexibility makes it easier for speakers to communicate effectively by allowing them to express behaviors, conditions, or ideas in subtle ways that are consistent with their intended meaning. According to Luschützky (2015), suffixation is essential for conveying a broad range of attitudes, moods, and stylistic subtleties. As in /sadness/ or other adjectives, the suffix /-ness/ can be employed to accentuate the adjective. Binder (2024) also reported the use of affixes in creating physics terminology for languages that do not yet have them.

CONCLUSION

The thorough investigation of suffixation in Indonesian morphology has shed light on the frequency and semantic changes. These results highlight the crucial function that suffixes, particularly /-kan/, /-nya/, /-an/, and /-lah/, play in determining the structural makeup and semantic subtleties. Notwithstanding the examination, there are several restrictions on this study. It is possible that the corpus utilized does not fully capture the range of linguistic variances seen in all Indonesian areas and social groupings. Furthermore, the study's scope may have missed any recent linguistic changes that could have an impact on suffixation usage.

In order to obtain a more comprehensive understanding of suffix usage within Indonesian morphology, it may be worthwhile to pursue several avenues of inquiry. Firstly, longitudinal studies that monitor language changes and evolving suffixation patterns over time. Secondly, investigating the pragmatic implications of suffix usage in discourse structures could also illuminate the nuanced functions of suffixes in communication. Finally, comparative analyses with other Austronesian languages or languages in the region could reveal cross-linguistic suffixation patterns and typological variations. In conclusion, further research is necessary to fully grasp the complexity, variances, and changing nature of suffix usage within this diverse linguistic landscape.

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