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Morphological and Syntactic Insights into Shupamem Numerals

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Abstract

This paper provides an in-depth analysis of the complex numerical system in Shupamem, a Grassfield Bantu language spoken in Cameroon. It explores the formation of both elemental and compound cardinal numbers, elucidating the morphological processes involved, such as the use of prefixes and specific linking morphemes. The study further examines how cardinals function as modifiers of noun phrases, highlighting their nuanced positional flexibility and the associated morphological changes contingent upon the complexity of the numeral. Moreover, the paper investigates the systematic derivation of ordinal numbers from their cardinal counterparts. Grounded in a descriptive linguistic methodology based on authentic native speaker data, this research uncovers a highly structured and yet nuanced numerical system. The findings reveal Shupamem's distinct strategies for number formation, nominal modification, and ordinal derivation, thereby contributing to the typological understanding of numeral systems, particularly within the vast and diverse landscape of Bantu languages. This analysis offers empirical data that can inform broader theories of quantification and linguistic encoding of numerical concepts.

Keywords: Bantu Languages, cardinals, counting system, Linguistic Typology, Morphology, numerals, ordinals, quantification, Shupamem, Syntax

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Introduction

Numerals, as fundamental linguistic categories, are universally present in human languages, serving as essential tools for quantifying entities, expressing order, and facilitating complex arithmetic and the conceptualization of quantity. Defined as 'words or expressions used to express numbers, including counting numbers, ordinals, and other special numbers' (The Oxford Handbook of Linguistics), numeral systems reflect profound cognitive capacities for abstraction and organization. The study of these systems provides a unique window into a language's morphological processes, syntactic structures, and semantic mechanisms, while also contributing to broader linguistic typology and theories of human cognition. The diversity observed in numeral systems across the world's languages, from simple additive structures to complex multiplicative and subtractive patterns, underscores the varied strategies languages employ to encode numerical information.

This paper presents an in-depth description and analysis of the intricate numeral system of Shupamem, a Grassfields Bantu language. Shupamem, spoken by the Bamun people, primarily in the Noun division of the West Region of Cameroon, presents a compelling case for such a study. As a Bantu language, its numeral system is not merely about word forms but also about how these forms interact with the language's rich morphological and phonological properties. Its status as an under-documented language, despite its significant number of speakers and vibrant linguistic community, means that a detailed analysis of its numerical system fills a critical gap in the existing linguistic literature on Bantu languages.

Shupamem is characterized by a canonical SVO (Subject-Verb-Object) basic sentence structure and possesses an interesting noun class system comprising 15 distinct classes, typically occurring in singular/plural pairings (Nchare, 2012). This noun class system is a hallmark of Bantu languages, and although it is not directly involved in numeral agreement for all numbers, it remains an important contextual feature. The language's verbal morphology is notably complex, distinguishing between a present tense (often associated with aspect), four past tenses, and three future tenses, which allows for fine-grained temporal and aspectual distinctions. Phonologically, Shupamem boasts an inventory of 27 consonants and 10 vowels (with lax/tense distinctions), alongside a tonal system of three level tones (High, Low, Mid) and two contour tones (Rising, Falling). These prosodic features are crucial to its phonology and can influence the realization and disambiguation of lexical items, including potentially numeral forms.

The primary objective of this study is to provide a systematic and comprehensive description of cardinal and ordinal numbers in Shupamem. We aim to detail their morphological formation processes (including prefixation, compounding, and the use of linking morphemes), their syntactic behavior as modifiers of noun phrases (addressing positional constraints and any morphological adjustments), and the rules governing their derivation. This research seeks not only to enrich the descriptive linguistics of Shupamem but also to contribute to the typological understanding of numeral systems by offering empirical data from a less-studied linguistic context.

This study offers a comprehensive description and analysis of the numeral system of Shupamem, a less-documented Bantu language variety. By examining the morphological structures and syntactic behaviors of numerals in Shupamem, the paper fills an important empirical gap in Bantu linguistics, contributing vital data to ongoing typological and

comparative research. The findings offer insights into how numeral morphology interacts with noun class agreement and positional syntax, thereby expanding our understanding of numeral formation strategies within and beyond the Bantu family. Furthermore, the study's integration of synchronic description and typological comparison advances theoretical models of morphosyntactic variation and numeral system organization in understudied African languages.

This paper seeks to answer the following questions: (i) What are the morphological characteristics and formation processes of cardinal, ordinal, and compound numerals in Shupamem, and how does noun class agreement manifest within these forms? (ii) How are numerals syntactically integrated into noun phrases in Shupamem, and what positional and morphosyntactic constraints govern their placement relative to nouns? (iii) In what ways does the Shupamem numeral system conform to or diverge from known typological patterns in Bantu languages concerning numeral morphology and syntax? These three questions, which together form a comprehensive inquiry into the numeral system of Shupamem, will help capture the complexity of numeral formation and usage in Shupamem, situating the findings meaningfully within ongoing typological and theoretical discussions.

Literature Review

The study of numeral systems constitutes a significant branch within linguistic typology and descriptive linguistics, exploring how languages quantify entities and express numerical concepts. Numeral systems across the globe display remarkable diversity, yet they also adhere to specific recurring patterns and organizational principles (Comrie, 2005; Greenberg, 1978).

Basic Principles of Numeral Systems

A fundamental aspect of numeral systems is their base, which refers to the number used as the primary multiplier for forming higher numbers. Decimal (base-10) systems are the most prevalent globally, but vigesimal (base-20), quinary (base-5), and even more complex systems exist. Within a given base, numbers are constructed using basic cardinals (mostly single morphemes for foundational quantities like 'one', 'two', 'ten', 'hundred', 'thousand') and compound cardinals (formed by combining basic units through addition, multiplication, or a combination of operations). For instance, 'eleven' might be 'ten-one' and 'twenty' might be 'two-tens'. The linguistic mechanisms for compounding can involve simple juxtaposition, linking morphemes (like conjunctions or additive markers), or more complex morphological processes (Croft, 2003). Irregular forms, often for low numbers or shared values, are also widely attested as a result of historical sound changes or frequent usage.

Numeral Systems in Bantu Languages

The Bantu languages, spanning a vast geographical area in sub-Saharan Africa, exhibit a rich variety of numeral systems, although many share commonalities, particularly a decimal base. Key features often observed in Bantu numeral systems include noun class agreement. In effect, many Bantu languages exhibit some form of noun class agreement on numerals, particularly for lower numbers (e.g., 'two children' may involve a numeral taking a prefix that agrees with the noun class of 'children') (Maho, 2003; Nurse & Philippson, 2003). This agreement mechanism is a hallmark of Bantu languages and influences the syntactic integration of numerals.

Compounding strategies are also observed in Bantu languages. While the decimal base is standard, the precise compounding strategies for numbers beyond ten can vary. Some languages use additive constructions (e.g., 'ten plus two' for twelve), while others employ multiplicative structures (e.g., 'two times ten' for twenty). The choice of linking morphemes (e.g., words for 'and', 'with', 'plus') is also a point of variation. Moreover, the syntactic position of numerals relative to the noun they modify can vary. Some languages place numerals before the noun, while others place them after, and some allow both positions, sometimes with semantic or pragmatic distinctions.

Finally, the formation of ordinal numbers from cardinals is typically systematic, often involving the addition of affixes (prefixes or suffixes) or the use of auxiliary words or particles (Doke, 1935, for Zulu). Exceptions for 'first' and 'second' are standard across language families.

Previous comprehensive works on Bantu languages, such as Guthrie's (1967–1971) comparative studies and more focused grammars, provide crucial typological context. By analyzing the structure of Shupamem’s numeral system, this study provides empirical data that can refine and expand our understanding of Bantu numeral typology, highlighting both shared characteristics and unique features.

Recent Developments in Bantu Numeral Studies

Building on this foundation, recent scholarship has expanded the scope of Bantu numeral research with more detailed synchronic and diachronic accounts, refined typological frameworks, and enhanced comparative methodologies. For instance, Bernander et al. (2020) provide an in-depth analysis of numeral systems in the Western Serengeti subgroup, highlighting additive strategies and morphosyntactic behavior that illuminate historical pathways and genealogical relationships within Eastern Bantu varieties. Their work exemplifies the integration of formal linguistic description alongside historical-comparative approaches.

Morphosyntactic variation in East African Bantu languages has recently received focused attention, as documented by Güldemann (2023). These works describe complex gender-number systems, verbal morphology, and agreement phenomena, enriching the understanding of local innovations and typological diversity.

From a broader typological perspective, Kofi et al. (2025) employ corpus-based methods to investigate the semantic and morphophonological productivity of noun class systems, arguing that morphophonological cues frequently take precedence over semantic motivations in class assignment. This aligns with ongoing research investigating the interfaces of morphology and syntax within Bantu languages.

Additionally, phylogeographic and phylogenetic analyses, such as those of Currie et al. (2022), use lexical datasets and statistical modeling to trace the Bantu language expansion and provide evolutionary insights relevant to the historical development of numeral systems.

Shupamem Linguistic Overview

A deeper understanding of Shupamem's general linguistic structure provides essential context for its numeral system.

Classification and Geographic Context

Shupamem is classified as a Grassfield Bantu language (Guthrie, 1967-1971; Zone A.90), a subgroup of the larger Niger-Congo language family. The Bamun people speak it, a significant ethnic group primarily concentrated in the Noun division of the West Region of Cameroon. This linguistic affiliation places Shupamem within a vast network of languages with shared historical origins and many standard structural features, particularly its noun class system.

Morphological and Syntactic Features

A defining characteristic of Shupamem, like most Bantu languages, is its system of 15 noun classes. Prefixes on nouns mark these classes and usually trigger agreement morphology on adjectives, demonstratives, pronouns, and sometimes verbs. While some Bantu languages exhibit noun class agreement on lower numerals, the exact interplay between Shupamem numerals and their noun classes warrants specific investigation, particularly regarding the presence or absence of agreement prefixes on the numerals themselves.

As for the sentence structure, Shupamem maintains a canonical SVO (Subject-Verb-Object) basic sentence structure. However, other structures can be derived from specific syntactic operations (focus, topic, …). The position of numerals, whether fixed or flexible, interacts with this underlying word order.

The verbal system is rich in tense and aspect distinctions, with a present tense often closely tied to aspectual notions, four distinct past tenses, and three future tenses. This complex system allows for precise temporal and aspectual nuances in communication.

Phonological Features

Shupamem possesses a phonological inventory consisting of 27 consonants and 10 vowels. Crucially, it is a tonal language, utilizing a system of three-level tones (High, Low, Mid) and two contour tones (Rising, Falling). These tones are phonologically distinctive, meaning they can differentiate lexical items (e.g., minimal pairs distinguished only by tone) and can also carry grammatical or semantic information. While the core numeral forms are segmental, the phonetic realization and potential tonal patterns of numerals are integral to their pronunciation and recognition by native speakers.

Methodology

This study adopts a rigorous descriptive linguistic methodology, emphasizing empirical data collection and meticulous analysis, drawing insights directly from native speakers of Shupamem.

Data Collection and Corpus Construction

The primary data for this research were obtained through fieldwork sessions conducted with adult native speakers of Shupamem. The informants were selected to represent a range of

ages and, where possible, different geographical origins within the Bamun linguistic community to ensure a comprehensive and representative dataset. Data elicitation employed (i) direct elicitation: informants were prompted to count in Shupamem, from one upwards, and to provide the numeral forms for various quantities; (ii) contextualized elicitation: sentences and phrases requiring the use of numerals were constructed in French or English and then translated into Shupamem by the informants. This helped to ascertain the natural syntactic placement and morphological variations of numerals in context. (iii) grammaticality judgments: informants were asked to judge the grammaticality and naturalness of pre-constructed sentences involving numerals, including variations in position and form, to identify restrictions and preferences. Finally, (iv) semantic clarification, whereby informants were asked to explain the precise meaning conveyed, ensuring accurate semantic mapping, was employed. The collected data, primarily consisting of spoken utterances, were audio-recorded to ensure accuracy for later transcription and analysis.

Data Processing and Annotation

All elicited Shupamem examples, including individual numeral forms and their usage in sentences, were phonologically transcribed using the International Phonetic Alphabet (IPA). This ensured precise representation of segmental and suprasegmental features. Shupamem examples are accompanied by an interlinear gloss, adhering to the Leipzig Glossing Rules, followed by a free English translation.

Analytical Approach

The analysis is descriptive and qualitative, focusing on identifying systematic patterns, rules, and exceptions within the Shupamem numeral system. The analytical process involved **morphological decomposition, syntactic analysis, and typological comparison.** Complex numeral forms were broken down into their constituent morphemes to understand their internal structure and the contribution of each part. The linear order of numerals relative to the noun and other constituents in noun phrases was examined to identify constraints and permissible variations. Finally, implicitly and explicitly, Shupamem's numeral system was compared to known patterns in other Bantu languages and general linguistic typologies to highlight unique features and confirm commonalities. The aim was to document the structural properties of Shupamem numerals systematically and to understand how they integrate and function within the larger grammatical framework of the language.

Analysis of Numerals in Shupamem

This section presents a detailed analysis of the structure, formation, and usage of cardinal and ordinal numbers in Shupamem, based on empirical data.

The Counting System (Basic and Compound Cardinals)

Basic Cardinals

Basic cardinals in Shupamem serve as the building blocks for higher numbers. These include the integers from one to nine, along with the key multiplicative bases of ten (10), a

hundred (100), and a thousand (1000). A salient morphological feature observed in the basic cardinals from one to nine is their optional initial prefix |-í|. While not directly a noun class prefix in all contexts, its presence or absence can sometimes depend on the numeral's syntactic role or position, hinting at a historical or derivational relationship. Shupamem numerals from one to ten are illustrated hereafter:

(1)

- í-mɔ̀ʔ / mɔ̀ʔ ‘one’
- í-pă / mbă ‘two’
- í-tɛ́t / tɛ́t ‘three’
- í-pkà / kpà ‘four’
- í-tiɛ̀n / tiɛ̀n ‘five’
- ì-ntú: / ntú: ‘six’
- ì-sà:mbà / sà:mba ‘seven’
- ì-fá:mə́ / fá:mə́ ‘eight’
- ì/kò:-vǔʔ ‘nine’
- (kò:)-ɣə́m ‘ten’
- ŋkù:t ‘a hundred’
- ŋkà:m ‘a thousand’

From the data above, we note that Shupamem numerals exhibit a rich and complex structure that reflects several important linguistic features. The basic numerals from one to eight consistently show optional prefixation, where forms such as í-mɔ̀ʔ/mɔ̀ʔ (‘one’) and í-pă/mbă (‘two’) alternate between prefixed and bare roots. This suggests a degree of morphological flexibility, possibly influenced by syntactic context, historical development, or emphasis, rather than strict noun class agreement. The prefixes themselves display tonal variation, with high tones (í-) for lower numbers and low tones (ì-) for numerals from six to eight. This highlights the language’s sensitivity to tone and its role in distinguishing meaning and structure. As we move to higher numerals, particularly ‘nine’ and ‘ten’, a different prefix (kò:-) appears as an alternative or in combination with the existing pattern, indicating a shift in morphological strategy or the introduction of distinct morphemes for higher numbers.

The numerals for ‘hundred’ (ŋkù:t) and ‘thousand’ (ŋkà:m) are monomorphemic and begin with nasal consonant clusters, a feature often associated with noun class markers, but here likely serving as lexicalized bases for larger quantities. The overall system is decimal, with ‘ten’ (ɣə́m) functioning as a pivotal base, and compound numerals beyond ten are formed through an additive process: the base numeral is combined with a linking morpheme (nʃwə̀p, ‘add’) and the appropriate unit numeral, resulting in transparent and systematic constructions for numbers like eleven through nineteen. This approach to compounding, along with the presence of dedicated terms for higher bases, demonstrates both the regularity and the typological richness of Shupamem’s numeral system, where tonal, morphological, and semantic elements interact to create a nuanced and expressive set of forms for quantification.

Compound Cardinals

Shupamem constructs compound cardinals through systematic combinations, primarily employing the linking morpheme **nʃwə̀p** ‘add.’ and, for more complex structures, **nə̀** ‘plus’.

This system operates on a decimal (base-10) principle, with systematic ways to form numbers beyond the basic units.

For numbers ranging from eleven to nineteen, the pattern typically involves the word for 'ten' (**ɣə́m**), followed by the additive morpheme **nʃwə̀p**, and then the corresponding basic numeral, often retaining its prefix. This is illustrated in (2) below:

(2)
a) ɣə́m-nʃwə̀p-í-mɔ̀ʔ
ten-add-one
“eleven”
b) ɣə́m-nʃwə̀p-í-pă
ten-add-two
“twelve”
c) ɣə́m-nʃwə̀p-ì-vŭʔ
ten-add-nine
“nineteen”

From the data above, we note that Shupamem employs a highly transparent and systematic approach to constructing compound numerals, particularly those between eleven and nineteen. The language utilizes a strictly additive strategy where compound numerals are formed through a predictable three-part structure: the base 'ten' (ɣə́m) serves as the foundation, followed by the dedicated linking morpheme nʃwə̀p glossed as 'add', which explicitly signals the additive relationship, and finally the appropriate unit numeral that retains its prefixed form (í-mɔ̀ʔ 'one', í-pă 'two', ì-vŭʔ 'nine'). This construction method creates morphologically complex but semantically transparent forms, such as ɣə́m-nʃwə̀p-í-mɔ̀ʔ ('eleven', literally 'ten-add-one') and ɣə́m-nʃwə̀p-í-pă ('twelve', literally 'ten-add-two').

The consistent presence of the prefixed form of the unit numeral (í- or ì-) in these compounds contrasts with the optionality of this prefix in standalone contexts, suggesting that the prefix may serve a specific morphosyntactic function within compound structures, possibly facilitating the attachment of the unit numeral to the preceding linking morpheme or marking its status as a bound element within the larger numerical expression. The explicit use of a dedicated additive morpheme (nʃwə̀p) rather than simple juxtaposition or a general conjunction is typologically significant, as it creates a specialized grammatical construction specifically for numerical addition, highlighting the cognitive and linguistic importance of precise quantification in the language. This decimal-based additive system, with an overt linking morpheme, represents a clear and efficient strategy for numerical expression, allowing speakers to construct higher numbers through a logical combination of simpler elements while maintaining complete semantic transparency throughout the numeral system.

An interesting alternative, more succinct formation exists for numbers twelve to nineteen (but not for eleven). In this construction, the basic cardinal directly combines with **nʃwə̀p** ‘add.’, suggesting a potentially lexicalized or more integrated form, as shown in (3) below:

(3)
a) pɛ̀ʔ-nʃwə̀p

two-add
"twelve"

b) vǔʔ-nʃwə̀p
nine-add
"nineteen"

It appears from the data above that Shupamem allows for an alternative, more succinct formation of compound numerals for values twelve through nineteen (excluding eleven), in which the fundamental cardinal numeral is directly combined with the additive morpheme nʃwə̀p 'add'—for example, pɛ̀ʔ-nʃwə̀p for 'twelve' and vǔʔ-nʃwə̀p for 'nineteen'. This construction omits the explicit mention of the base 'ten' (ɣə́m) that is otherwise present in the more transparent additive compounds (such as ɣə́m-nʃwə̀p-í-pă 'twelve'), resulting in a more compact and possibly more lexicalized form. The direct attachment of the unit numeral to the additive morpheme suggests a high degree of integration between the two elements, potentially reflecting a process of grammaticalization or lexicalization in which frequent compound numerals become fixed expressions over time. This pattern also highlights a certain asymmetry in the numeral system, as eleven does not participate in this alternative formation, possibly due to its unique status or lower frequency of use. Overall, this compounding strategy demonstrates the language's capacity for morphological economy and innovation, while still maintaining the semantic transparency of the additive relationship, and it provides insight into how numeral systems can evolve to balance clarity, efficiency, and conventionalization in everyday language use.

Multiples of ten (e.g., twenty, thirty) are formed by juxtaposing the basic cardinal (acting as the multiplier) with **ŋgə́m**, which is a phonologically conditioned form of **ɣə́m** 'ten'. This structure translates to 'X-tens'. Consider the following:

(4)

a) pɛ̌ʔ-ŋgə́m
two-ten
"twenty"

b) tɛ̌t-ŋgə́m
three-ten
"thirty"

c) sà:-ŋgə́m (*sà:mba-ŋgə́m)
seven-ten
"seventy"

The data above indicate that Shupamem employs a multiplicative strategy for forming multiples of ten, wherein the fundamental cardinal numeral directly combines with a special form of 'ten' (ŋgə́m) to create decimal multiples. This construction demonstrates a clear multiplicative relationship where the first element functions as a coefficient or multiplier of the base 'ten', resulting in transparent forms such as pɛ̌ʔ-ŋgə́m ('twenty', literally 'two-ten') and tɛ̌t-ŋgə́m ('thirty', literally 'three-ten'). Notably, the base element ŋgə́m represents a phonologically conditioned allomorph of the standalone form ɣə́m ('ten'), with the initial consonant undergoing fortification from a voiced velar fricative [ɣ] to a prenasalized velar stop [ŋg] when it appears in this specific compound context. This phonological alternation likely facilitates articulation at

the morpheme boundary and may reflect a broader pattern of consonant strengthening in compound formations. The example of 'seventy' (sà:-ŋgə́m) further reveals morphophonological reduction, where the complete form of 'seven' (sà:mba) is truncated to sà: when serving as a multiplier, suggesting that certain numerals undergo simplification in compound contexts to optimize the resulting form. The explicit notation that *sà:mba-ŋgə́m is ungrammatical confirms that this truncation is obligatory rather than optional, pointing to systematic morphophonological rules governing numeral compounding. This multiplicative pattern for decimal formation aligns with common strategies observed in many decimal-based numeral systems cross-linguistically. At the same time, the specific phonological accommodations and morpheme truncations demonstrate Shupamem's particular approach to balancing semantic transparency with phonological well-formedness in its numerical expressions. This multiplicative principle extends consistently to hundreds and thousands, as in (5) below:

(5)

a) pɛ̌ʔ-ŋká:m
   two-thousand
   “two thousand”

b) tɛ̌t-ŋká:m
   three-thousand
   “three thousand

c) sà:-ŋkʉ̀:t (*sà:mba-ŋkʉ̀:t)
   seven-hundred
   “seven hundred

We note that the multiplicative principle observed in the formation of Shupamem numerals for tens extends seamlessly to the construction of hundreds and thousands. In this system, the basic cardinal numeral functions as a multiplier and is directly combined with the lexical base for ‘hundred’ (ŋkʉ̀:t) or ‘thousand’ (ŋká:m), yielding expressions such as pɛ̌ʔ-ŋká:m (‘two thousand’), tɛ̌t-ŋká:m (‘three thousand’), and sà:-ŋkʉ̀:t (‘seven hundred’). This pattern results in forms that are interpreted as ‘two-thousand,’ ‘three-thousand,’ and ‘seven-hundred’. This mirrors the structure used for multiples of ten. Notably, there is evidence of morphophonological adjustment in these compounds, as seen in the reduction of the complete form of ‘seven’ (sà:mba) to sà: when it serves as a multiplier, a process that is obligatory since the unreduced form (*sà:mba-ŋkʉ̀:t) is ungrammatical. This reduction likely serves to optimize the phonological structure of the compound and maintain speech fluency. The use of the nasal-initial bases (ŋkʉ̀:t and ŋká:m) for ‘hundred’ and ‘thousand’ further reflects the language’s morphological conventions and may be linked to historical noun class markers. Altogether, this multiplicative compounding strategy provides a highly regular and efficient means for expressing large quantities, reinforcing the decimal logic of the system and demonstrating Shupamem’s capacity for systematic and transparent numerical expression across all scales.

For more complex compound numbers, combining tens with units (e.g., twenty-one, thirty-six), the additive morpheme **nʃwə̀p** serves as the link, as in the data below:

(6)

a) pɛ̌ʔ-ŋgə́m-nʃwə̀p-í-mɔ̀ʔ

two-ten-add-one
"twenty-one"

b) tɛ̌t-ŋgə́m-nʃwə̀p-ì-ntú:
three-ten-add-six
"thirty-six"

c) kpà-ŋgə́m-ʃwə̀p-ì-sà:mbà
four-ten-add-seven
"forty-seven"

The provided examples illustrate that for forming more complex compound numbers, specifically those combining tens with units (e.g., twenty-one, thirty-six), Shupamem consistently employs a transparent, multi-part additive structure. This pattern involves juxtaposing the previously formed multiple of ten (e.g., pɛ̌ʔ-ŋgə́m 'two-ten' for twenty, tɛ̌t-ŋgə́m 'three-ten' for thirty) with the additive morpheme nʃwə̀p, which functions as a crucial semantic and syntactic link. This is then followed by the appropriate unit numeral (e.g., í-mɔ̀ʔ 'one', ì-ntú: 'six', ì-sà:mbà 'seven'), resulting in highly descriptive forms like pɛ̌ʔ-ŋgə́m-nʃwə̀p-í-mɔ̀ʔ ('twenty-one', literally 'two-ten-add-one'). The persistence of the unit numeral's initial prefix (like í- or ì-) in these longer compounds suggests that these prefixes are integral to the unit numeral's form, even when combined in complex structures.

In numbers involving hundreds and thousands with smaller units, the morpheme **nə̀ "plus"** is often utilized, particularly when linking distinct numerical components.

(7)

a) pɛ̌ʔ-ŋká:m-nʃwə̀p-í-mɔ̀ʔ
two-thousand-add-one
"two thousand and one"

b) tɛ̀t-ŋkʉ̀:t-nʃwə̀p-ì-ntú:
three-hundred-add-six
"three hundred and six"

c) ŋkʉ̀:t-nə̀-í-mɔ̀ʔ
hundred-plus-one
"one hundred and one"

d) ŋká:m-nə̀-í-pkà
thousand-plus-four
"one thousand and four"

e) ŋká:m-nə̀-pkà-nʃwə̀p
thousand-plus-fourteen
One thousand and fourteen

The examples provided reveal a complex system for constructing complex numerals in Shupamem, particularly those involving the combination of hundreds and thousands with smaller units. A close examination shows that the language employs two distinct linking morphemes—nʃwə̀p 'add' and nə̀ 'plus'—whose distribution appears to be governed by specific

structural contexts. When a multiplicative compound (like pɛ̌ʔ-ŋká:m 'two thousand' or tɛ̀t-ŋkù:t 'three hundred') is combined with a single-digit numeral, the additive morpheme nʃwə̀p is used, as in pɛ̌ʔ-ŋká:m-nʃwə̀p-í-mɔ̀ʔ 'two thousand and one' and tɛ̀t-ŋkù:t-nʃwə̀p-ì-ntú: 'three hundred and six'. Conversely, when a base unit like ŋkù:t 'hundred' or ŋká:m 'thousand' without a multiplier (implicitly understood as 'one hundred' or 'one thousand') combines with smaller numbers, the alternative linking morpheme nə̀ 'plus' is preferred, as in ŋkù:t-nə̀-í-mɔ̀ʔ 'one hundred and one' and ŋká:m-nə̀-í-pkà 'one thousand and four'. Particularly revealing is the example ŋká:m-nə̀-pkà-nʃwə̀p 'one thousand and fourteen', where nə̀ links the thousand to the teen number, while the teen number itself (pkà-nʃwə̀p 'fourteen') employs the more common additive morpheme nʃwə̀p. This hierarchical distribution of linking morphemes suggests a sophisticated internal structure to complex numerals, where different connectors are employed at different levels of the numerical hierarchy, potentially reflecting cognitive distinctions between primary and secondary numerical operations. The system thus balances economy (using the shortest form for the most frequent combinations) with clarity (maintaining distinct linking morphemes for different structural relationships), resulting in a numeral system that is both systematic and nuanced in its morphological expression.

Modification of Cardinals

The syntactic behavior of cardinals when modifying noun phrases (NPs) in Shupamem is fascinating, as it exhibits variation in position and associated morphological changes based on the complexity of the numeral.

Basic Cardinals (1-9) as Modifiers

Basic cardinals from one to nine exhibit positional flexibility, appearing either preposed or postposed to the noun they modify. However, this flexibility comes with morphological consequences. When proposed to the NP, these basic cardinals shed their initial prefixes. Furthermore, specific low numbers undergo lexical changes: í-mɔ̀ʔ ‘one’ becomes ndì: ‘one’, and í-pă: ‘two’ transforms into pɛ̀ʔ ‘two’ when appearing in a pre-nominal position. This suggests allomorphic variation conditioned by the syntactic environment.

(8)

a) ndì: mɔ́n ‘one child’ (preposed) vs mɔ́n í-mɔ̀ʔ ‘child one’ (postposed)
b) pɛ̌ʔ pɔ́n ‘two children’ (preposed) vs pɔ́n pí-pă: ‘children two’ (postposed)
c) tɛ̌t pɔ́n ‘three children’ (preposed) vs pɔ́n pí-tɛ́t ‘children three’ (postposed)
d) kpà pɔ́n ‘four children’ (preposed) vs pɔ́n pí-kpà ‘children four’ (postposed)
e) Ɣə̀m pɔ́n ‘ten children’ (preposed) but *pɔ́n ɣɔ́m (postposed, ungrammatical)

An examination of these examples shows that basic cardinal numerals from one to nine in Shupamem display notable positional flexibility, as they can occur either before or after the noun they modify. However, this flexibility is accompanied by clear morphological consequences. When cardinals are preposed (placed before the noun), they systematically lose their initial prefixes, resulting in bare root forms (e.g., ndì: mɔ́n ‘one child’, pɛ̌ʔ pɔ́n ‘two children’, tɛ̌t pɔ́n ‘three children’). In addition, certain low numerals undergo lexical changes in this pre-nominal position: í-mɔ̀ʔ ‘one’ becomes ndì:, and í-pă: ‘two’ becomes pɛ̀ʔ, indicating allomorphic variation that is conditioned by syntactic environment.

In contrast, when the numerals are postposed, they retain their complete prefixed forms (e.g., mɔ́n í-mɔ̀ʔ ‘child one’, pɔ́n pí-pă: ‘children two’, pɔ́n pí-tɛ́t ‘children three’), which suggests that the prefix is obligatory in this syntactic context. This pattern highlights a morphosyntactic asymmetry in the numeral system, where the position of the numeral relative to the noun directly determines its morphological shape. Furthermore, the numeral for ‘ten’ (ɣə́m) is only grammatical in the pre-nominal position (Ɣə̀m pɔ́n ‘ten children’), while its post-nominal use is ungrammatical (*pɔ́n ɣə́m), pointing to additional positional restrictions for higher numerals. Overall, these facts underscore the dynamic interplay between syntax and morphology in Shupamem, with allomorphic variation and prefixation patterns tightly regulated by the numeral’s syntactic placement within the noun phrase.

In contrast, the numeral **ɣə́m** ‘ten’ demonstrates a fixed syntactic position, always preceding the noun phrase it modifies. A postposed position for 'ten' is consistently ungrammatical (8.e), indicating a stricter ordering rule for this particular basic cardinal.

Compound Cardinals as Modifiers

The syntactic rules governing compound cardinals as noun modifiers are more restrictive than those for basic cardinals. Compound cardinals consisting of precisely two numerical items (e.g., 'twelve', 'forty', 'three hundred') consistently precede the noun phrase they modify. Any attempt to place them post-nominally results in ungrammaticality. This is illustrated in (9) below:

(9)
a) pɛ̀ʔ-nʃwə̀p pɔ́n ‘twelve children’ (preposed)
b) *pɔ́n pɛ̀ʔ-nʃwə̀p (postposed, ungrammatical)
c) kpà-ŋgə̂m pɔ̀n ‘forty children’ (preposed)
d) *pɔ̀n kpà-ŋgə̂m (postposed, ungrammatical)
e) tɛ̀t-ŋkŭt pɔ́n ‘three hundred children’ (preposed)
f) *pɔ́n tɛ̀t-ŋkŭt (postposed, ungrammatical)
g) sà:ŋká:m pɔ́n ‘seven thousand children’ (preposed)
h) *pɔ́n sà:ŋká:m (postposed, ungrammatical)

The data reveal that compound cardinals in Shupamem operate under more constrained syntactic conditions than their basic counterparts. While basic cardinals from one to nine exhibit positional flexibility, compound cardinals consisting of exactly two numerical elements are subject to strict positional requirements. The evidence demonstrates that these compound numerals—whether formed through addition (pɛ̀ʔ-nʃwə̀p 'twelve'), multiplication (kpà-ŋgə̂m 'forty', tɛ̀t-ŋkŭt 'three hundred', sà:ŋká:m 'seven thousand')—must invariably precede the noun phrase they modify. Any attempt to position them post-nominally results in ungrammaticality, as shown by the consistent pattern of asterisked examples. This syntactic restriction appears to be categorical rather than gradient, applying uniformly across different types of compound numerals regardless of their internal structure or the specific numerical values they express. Such a constraint likely reflects deeper principles in Shupamem's grammar concerning the relationship between morphological complexity and syntactic positioning. This suggests that as numerals increase in structural complexity, their syntactic behavior becomes more restricted. This pattern aligns with cross-linguistic tendencies where more complex modifiers often

occupy fixed positions, potentially to facilitate processing or to maintain consistent semantic scope relationships within the noun phrase. The obligatory pre-nominal position for compound numerals also creates a clear structural distinction between complex and straightforward numerical expressions in the language, potentially serving as a processing cue for hearers regarding the quantificational complexity of the expression.

Another interesting and complex pattern emerges for compound cardinals composed of more than two items. These numerals exhibit an 'encircling' pattern, where the numeral is split, and the noun phrase is sandwiched between its components. This phenomenon suggests a discontinuity in the numeral phrase, where the modifying relationship is distributed across the noun.

(10)

a) Ɣə̀m pɔ́n nʃwə̀p-í-pă:
ten children add-PREF-two

"twelve children"

b) ŋkù:t pɔ́n nə̀ Ɣə́m
hundred children plus ten
“one hundred and ten children”

c) ŋkà:m pɔ́n nə̀ Ɣə́m nʃwə̀p-ípă:
thousand children plus ten add two
“one thousand and twelve children”

When numerals consist of more than two numerical components, the language employs what can be characterized as an 'encircling' or 'discontinuous' construction, where the numeral phrase is split, with the noun phrase strategically positioned between its constituent parts. This pattern creates a structural sandwich where the initial numerical element (typically representing the highest power of ten) precedes the noun, while the remaining numerical components follow it. The examples demonstrate this systematic arrangement: in Ɣə̀m pɔ́n nʃwə̀p-ípă: ('twelve children'), the base 'ten' (Ɣə̀m) precedes 'children' (pɔ́n), while the additive component (nʃwə̀p-ípă: 'add-two') follows it. Similarly, in more complex expressions like ŋkà:m pɔ́n nə̀ Ɣə́m nʃwə̀p-ípă: ('one thousand and twelve children'), the highest numerical unit (ŋkà:m 'thousand') appears before the noun, with the remaining elements (nə̀ Ɣə́m nʃwə̀p-ípă: 'plus ten add-two') positioned after it. This discontinuous structure contrasts sharply with the behavior of simpler compound numerals (consisting of exactly two elements), which must appear entirely before the noun. The encircling pattern likely serves multiple functions: it may reduce processing complexity by breaking up lengthy numerical expressions, maintain the prominence of the noun being quantified, and potentially disambiguate the scope of modification in complex quantificational structures. From a typological perspective, this pattern represents an innovative solution to the challenge of integrating complex numerical expressions within noun phrases, highlighting Shupamem's distinctive approach to balancing semantic transparency with syntactic efficiency in its grammatical architecture. This encircling pattern is a distinct feature of Shupamem's numeral syntax, potentially serving to manage the length and complexity of the numeral phrase or to highlight the noun.

Derivation of Ordinals

The formation of ordinal numbers in Shupamem largely follows a systematic derivational process from cardinal numbers, with two notable exceptions for the initial ordinals, a common cross-linguistic phenomenon reflecting high frequency and historical irregularity. The words for 'first' (pùm) and 'second' (mbá:rə̀) are idiosyncratic forms and do not follow a productive derivational rule from their cardinal counterparts. For all other ordinal numbers, a consistent pattern is observed: the morpheme mbá:rə̀ ‘following’ systematically precedes the corresponding cardinal number. This mbá:rə̀ functions as a derivational particle or an ordinal marker. This process is summarized in the data below:

(11)

a) Pùm ‘first’
b) mbá:rə̀ (ípă:) ‘second’
c) mbá:rə̀ ítɛ́t
following three
“third”
d) mbá:rə̀ ípkà
following four
“fourth”
e) mbá:rə̀ ítiɛ̀:n
following five
“fifth”
f) mbá:rə̀ íntú:
following six
“sixth”
g) mbá:rə̀ ɣə́m
following ten
‘tenth’
h) mbá:rə̀ ɣə́m ŋʃwə̀p ítɛ́t
Following ten add three
“thirteenth”

We note from these examples that Shupamem ordinal formation exhibits a pattern typical in many languages worldwide: a combination of irregular forms for the most frequent low ordinals and a systematic derivational process for all others. The irregularity of 'first' (pùm) and 'second' (mbá:rə̀) reflects their high frequency and likely historical development. At the same time, all subsequent ordinals follow a transparent derivational pattern using mbá:rə̀ ('following') as a productive ordinal marker prefixed to the corresponding cardinal. This creates forms like mbá:rə̀ ítɛ́t ('third', literally 'following three') and extends predictably to compound forms like mbá:rə̀ ɣə́m nʃwə̀p ítɛ́t ('thirteenth'). The system balances irregularity in high-frequency items with morphological transparency for less common ordinals, which maintains both economy and clarity in numerical expressions. This derivational mechanism highlights the systematicity of the ordinal system, despite its initial irregularities.

Discussion and Theoretical Implications

The detailed analysis of Shupamem's numeral system offers valuable insights into several aspects of linguistic theory and typology.

Numeral Typology and Base-10 System

Shupamem operates on a decimal (base-10) system, aligning with the most common numeral base found globally. The systematic use of **ɣə́m** 'ten', **ŋkù:t** 'hundred', and **ŋkà:m** 'thousand' as pivotal elements in compounding higher numbers reinforces this base. The combination strategies, particularly the additive **nʃwə̀p** and **nə̀**, are transparent and consistent, reflecting an arithmetic approach to number formation. The presence of alternative, more concise forms for numbers like 'twelve' (pɛ̀ʔ-nʃwəp vs. ɣə́m-nʃwəp-í-pă) suggests a dynamic system where linguistic economy or frequency of use may lead to reduced or lexicalized forms, a common phenomenon in language evolution.

Morphology-Syntax Interface in Numeral Modification

The varying behavior of cardinals when modifying noun phrases highlights a complex interplay between morphology and syntax. The optional prefix |-í| on basic cardinals 1-9, along with the specific lexical changes for 'one' (ndì:) and 'two' (pɛ̀ʔ) when preposed, points to distinct allomorphs or phonologically conditioned forms that are activated by syntactic position. This is significant because it demonstrates how morphology is sensitive to syntactic context, a crucial aspect of the morphology-syntax interface. The strict pre-nominal position of 'ten' and two-item compound cardinals, contrasting with the flexibility of lower basic cardinals, suggests a hierarchy or perhaps a developing lexicalization of these higher numeral phrases into fixed pre-nominal modifiers.

The most striking syntactic phenomenon is the 'encircling' pattern observed with compound cardinals of more than two items. This discontinuity, where the noun is inserted within the numeral phrase (e.g., Ɣə̀m pɔ́n nʃwə̀p-ípă: 'ten children add-two'), is not universally found and merits deeper investigation. Such constructions challenge simple models of numeral modification as a continuous unit. They may reflect strategies to manage cognitive load for longer numerical expressions or to emphasize the modified noun within a complex quantifying phrase. This pattern provides interesting comparative data for theories of phrase structure and linearization.

Ordinal Derivation and Irregularity

The regular derivation of ordinals using mbá:rə 'following' points to a productive morphological process for expressing order, which is efficient and transparent for higher numbers. The irregularity of 'first' and 'second' (pùm and mbá:rə) is a typologically common feature across languages. This often occurs because these low ordinals are highly frequent, leading to their unique lexicalization or historical phonological erosion that deviates from regular derivational patterns. This phenomenon underscores the balance between systematicity and lexical idiosyncrasy in language.

Contribution to Bantu Linguistics

This research makes a direct contribution to the descriptive linguistics of Shupamem by providing a systematic analysis of a previously underexplored grammatical domain. By detailing the specific mechanisms of number formation and modification in Shupamem, this study provides valuable empirical data for comparative Bantu linguistics. It allows for detailed comparisons with numeral systems in other Bantu languages, which helps to identify common ancestral patterns (e.g., the decimal base) and specific innovations or variations within different branches of the family (e.g., the encircling numeral pattern). Such detailed descriptions are crucial for reconstructing proto-Bantu forms and for understanding the typological diversity and evolution within this vast language family.

Conclusion

This paper presents a detailed, descriptive, and analytical account of the numeral system in Shupamem, a Grassfields Bantu language. It has documented the formation of both elemental and compound cardinal numbers, highlighting the pivotal roles played by optional prefixes and the linking morphemes nʃwə̀p (‘add’) and nə̀ (‘plus’). The study also examined the syntactic behavior of cardinals as noun modifiers, uncovering nuanced positional flexibility for simple numerals alongside a strictly pre-nominal placement—and, in the case of more complex compounds, an intriguing ‘encircling’ pattern where numerals appear before and after the noun. Moreover, the paper explored ordinal derivation, revealing that Shupamem employs both regular and irregular morphological processes.

The findings demonstrate that Shupamem’s numeral system is highly systematic and firmly based on a decimal structure. However, it employs distinctive morphological strategies and unique syntactic configurations not widely attested in other Bantu languages. In particular, the ‘encircling’ pattern of noun modification by complex numerals represents a novel syntactic strategy that expands the typological understanding of numeral-noun interactions.

This study makes a significant contribution to the linguistic documentation of Shupamem by providing a thorough analysis of an under-explored grammatical domain. Beyond enriching the descriptive grammar of the language, it offers valuable empirical data to the field of linguistic typology, particularly in the study of numeral systems and morphosyntactic interfaces. The insights gained from Shupamem challenge and refine universal theories of quantification and morphological-syntactic interaction by bringing to light data from an African language family that is often underrepresented in linguistic theory.

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AI Statement

This document has benefited from the application of AI-driven tools, including Grammarly, to refine its linguistic aspects. These tools were utilised to correct grammar and spelling and improve the overall writing style. It is acknowledged that the use of these technologies may introduce specific AI-generated linguistic patterns. However, the core intellectual content, data interpretation, and conclusions presented remain the sole work of the authors.

Statement of Absence of Conflict of Interest

The authors declare that there are no conflicts of interest related to the research, findings, or recommendations presented in this paper. All conclusions drawn are independent and unbiased.

References

Bernander, R., Laine, A. O., & Aunio, L. (2020). The numeral system(s) in Western Serengeti: Formal, functional, and historical inferences. *Languages and Cultures*, *54*, 20–43.

Binam Bikoi, C. (2012). *Atlas linguistique du Cameroun (ALCAM)*. CERDOTOLA.

Comrie, B. (2005). Numeral systems. In M. Haspelmath, M. Dryer, D. Gil, & B. Comrie (Eds.), *The world atlas of language structures online*. Max Planck Institute for Evolutionary Anthropology. https://wals.info/chapter/131

Croft, W. (2003). *Typology and universals* (2nd ed.). Cambridge University Press.

Currie, T. E., et al. (2022). Phylogeographic analysis of the Bantu language expansion. *Proceedings of the National Academy of Sciences*, *119*(31), e2112853119. https://doi.org/10.1073/pnas.2112853119

Dieu, M., & Renaud, P. (Eds.). (1983). *Atlas linguistique de l'Afrique centrale (ALAC): Atlas linguistique du Cameroun (ALCAM)*. Agence de Coopération Culturelle et Technique.

Doke, C. M. (1935). *Bantu linguistic terminology*. Longman, Green and Co.

Greenberg, J. H. (1978). Generalizations about numeral systems. In J. H. Greenberg (Ed.), *Universals of human language: Volume 3, Word structure* (pp. 249–295). Stanford University Press.

Güldemann, T. (2023). Animacy-based gender systems in Central Africa. *Africana Linguistica*, *29*, 67–123.

Guthrie, M. (1967–1971). *Comparative Bantu: An introduction to the comparative linguistics and prehistory of the Bantu languages* (Vols. 1–4). Gregg International.

Kofi, A., et al. (2025). Semantic and morphophonological productivity in the Kîîtharaka noun class system. *Glossa: A Journal of General Linguistics*, *10*(1), 1–32. https://doi.org/10.5334/gjgl.XXXX

Maho, J. F. (2003). *The Bantu bibliography*. Department of Oriental and African Languages, Göteborg University.

Morphosyntactic variation in East African Bantu languages: Descriptive and comparative approaches. (2024). *Contemporary African Linguistics*, *8*, 1–250.

Nchare, N. (2012). *The grammar of Shupamem* (Unpublished Doctoral dissertation). City University of New York, NY.

Nurse, D., & Philippson, G. (Eds.). (2003). *The Bantu languages*. Routledge.