Linguistic Typology at the Crossroads 4-1 (2024): 91-146 ISSN 2785-0943

Teko ideophones: description of a word class

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Submitted: 30/12/2022 Revised version: 26/07/2022
Accepted: 02/10/2023 Published: 12/06/2024

Abstract

The aim of this paper is to present a comprehensive description of the ideophones of Teko, a Tupi language spoken in French Guiana. This word class, previously only briefly described, is defined in this paper through a systematic comparison to nouns and verbs, at various levels: phonology, word structure, prosody, semantic, morphology, syntax and discourse use. In particular, various aspects of prosody are investigated, including syllabic structure, pitch, intensity and duration, and pauses. The qualitative and quantitative analyses are based on a lexical database of 177 ideophones, 420 occurrences in texts, and a subset of 101 tokens with audio-recording. Contrary to the common view on ideophones that postulates a rather marginal status of the latter, this paper shows that ideophones are in fact rather well integrated in the linguistic system of Teko. Yet they show regularities that require them to be considered a distinct word category.

Keywords: parts of speech; phonosymbolism; prosody; reduplication; pause; expressivity.

1. Introduction

The aim of this paper is to present a comprehensive description of the ideophones of Teko (Glottocode eme 1243). This word class was previously only briefly described (Rose 2011: 400-409) as a part-of-speech illustrating a situation through expressive means, in line with Doke (1935: 118) or Dingemanse (2019). In the following example, *tapug* illustrates a 'diving' situation through expressive means. In this context, the main characters of the myth (two sisters) dive into the river to escape their brother and thus turn into mermaids.

(1) ***tapug*** *ze-kapɨrer=ne* *ʔɨ-b* *o-po-por* *o-ho-oŋ.*
IDEO.diving RECP-behind=CONTR water-in 3-RED-jump 3-go-PL.S
'Splash, they dive in the water one after the other and go away.' 04.035

This paper contributes to the growing literature on the cross-linguistic definition and description of ideophones. More precisely, it aims to provide new data and analyses for the questions of whether ideophones are marginal in the lexicon, whether they are extra-grammatical, and whether they form a specific word class or not. To do this, ideophones are systematically compared to nouns and verbs, as concerns their phonology, prosody, semantic, morphology, syntax and discourse. This corpus-based multi-level comparison makes it clear that we are dealing with a separate word class.

Two methodological aspects make this study innovative. First, the comparison of ideophones with both nouns and verbs will be as systematic as possible. When relevant, quantitative analyses with statistical tests will be used to support the comparison. The objective is to avoid cherry-picking in the choice of examples or features to be put forward. Pointing to specific items or features runs the risk of over-exoticizing ideophones, by placing their characteristics in the foreground. Second, this study makes room for prosody, interpreting the term broadly, i.e. not just intonation, but also stress, syllabic structure of words, harmony processes, and pauses. The prosody of ideophones is not very well investigated, but some publications broach this topic (Nuckolls 1996; Kita 1997; Dingemanse 2017; Akita 2021; see also Smoll 2014: 20, for a list of other studies covering the prosody of ideophones).

The importance of studying the prosody of ideophones has been highlighted by the work of Akita (2021). It distinguishes three strategies for formally marking depictive (iconic) signs, which include ideophones. The strategies depend on which part of the utterance is concerned. In this framework, 'framing' marks the boundary between the ideophone and the rest of the utterance, and typically includes pauses and quotative markers; 'foregrounding' focuses on the characteristics highlighting the ideophone itself, such as prominent prosody; and 'backgrounding' focuses on the characteristics of the rest of the utterance (such as low pitch on a quotative verb). The present study investigates both the framing and foregrounding strategies to mark ideophones in speech.[1]

[1] The prosodic analysis of the data had already been carried out when the work of Akita (2021) was published, hence the lack of attention to the backgrounding strategy in the present paper.

The remainder of this section focuses on presenting the Teko language and the data. The following sections will focus in turn on segmental phonology (Section 2), root structure (Section 3), word-level prosody (Section 4), morphology (Section 5), syntax (Section 6), discourse use (Section 7), and semantics (Section 8). The final section (Section 9) will discuss the extent to which Teko ideophones are regular or marginal within the language system, and how they form a word class, by comparing their characteristics with those of Teko nouns and verbs.

1.1. Teko

The Teko community consists of about 400 people living in two areas in French Guiana: next to the Maroni river (on the border with Suriname) and at the Oyapock-Camopi confluence (on the border with Brazil). The community (formerly known as Emerillon) is the result of the aggregation of surviving members of different small ethnic groups, mainly of Tupí-Guaraní origin (Navet 1994). The Teko language is still actively being used and passed on to children as a native language but it must nevertheless be considered endangered given the small number of speakers and the ever-increasing intensity of contacts with French and Guianese Creole speakers.

Teko belongs to the Mawetí-Guaraní group (and more precisely its Tupi-Guaraní sub-group) of the Tupí stock (Rodrigues 1984; Rose 2023). Tupí languages are spoken throughout Brazil, in northern Argentina, Paraguay, Bolivia, and French Guiana. Ideophones, or sub-classes of word classes with sound symbolic features, have been mentioned for a large number of the Tupi languages, with a few rather detailed studies (Langdon 1994; Gabas 1999: 234-263) and a full book devoted to the issue in Awetí (Reiter 2011). In the latter work, a chapter is devoted to the comparison of ideophones and verb structures in the family (Reiter 2011: 495-575). Due to space limitations, this paper will focus on the description of Teko ideophones, without a systematic comparison to other Tupí languages.

The Teko language was first described at the turn of the millennium (Maurel 1998). A first reference grammar is available (Rose 2011), with ten pages devoted to ideophones. The present paper will build on it. Among the other published work on the language, the following papers deal with issues of interest for our present purposes: the distinction between nouns and verbs (Couchili et al. 2002), stress (Gordon & Rose 2006), reduplication (Rose 2005; Rose 2007), phonology (Rose

2008). A short introduction to relevant aspects of the language will be given in each section of this paper.

1.2. The sources

The dataset has been built from two main sources: my corpus, and an online dictionary.

The corpus was collected between 1999 and 2004 in French Guiana, mainly in the village of Camopi, but also in Cayenne and its surroundings. It is made up of wordlists, elicited data and texts. This work is mainly based on the text corpus. It is made up of thirty-eight short texts, with a total of 2000 utterances.[2] Twenty-five texts have been recorded in the field either by me between 1999 and 2003 or by Alexis Michaud in 1998. From these twenty-five recordings, only twenty-one recordings are available amounting about 100 minutes. These are transcribed in ELAN (2022). The other thirteen texts are written texts that had been previously published (Renault-Lescure et al. 1987; Maurel 1993; Maurel 2000; Association Solidarité Guyane 2000; Maurel 1991). All the texts are transcribed, translated into French and English, and annotated (with parts-of-speech and translation) at the morpheme level with Toolbox[3]. The Teko toolbox project (Rose 2018) also comprises a lexicon with 1465 entries, each with parts-of-speech information, and translation in French and English. An excerpt has been made public at the AILLA[4] and Ortolang[5] archives.

This corpus is complemented by a recent French-Teko dictionary published online by a group of speakers (Cachine et al. 2020). It has 2539 entries. Data from this source is followed by an asterisk when cited as an example or in a table in this paper.

This study aims to describe ideophones on the basis of the corpus and the online dictionary. It is therefore exploratory in that it draws from a limited set of data, and hardly builds on discussion with speakers (only a little elicitation on ideophones was carried out during fieldwork). The primary results of this work consist of two ideophone databases (Section 1.4).

[2] When cited as examples in this paper, sentences from the corpus are followed by the text number and the sentence number, separated by a dot, as in 04.035 for sentence #35 in text #4.

[3] https://software.sil.org/toolbox/

[4] https://www.ailla.utexas.org/collections/549/

[5] https://hdl.handle.net/11403/sldr000870

1.3. Presence of ideophones in the sources

Table 1 shows that the share of ideophones in the Teko lexicon varies from 5 to 8% depending on the source.[6] They represent 4% of the words in the text corpus, where they occur on average every five sentences. All in all, it is clearly not possible to consider this category as marginal in the Teko language and in speech.

	ideophones	nouns	verbs	roots/words	percentage of ideophones
dictionary	130	1155	819	2539	5%
Toolbox lexicon	108	541	270	1329	8%
Toolbox texts	420	2636	3133	10,068	4%

Table 1: Proportion of ideophones in the lexicon and texts.

1.4. Databases and datasets

Four databases accompany this paper as freely accessible supplementary materials in both csv and xlsx formats, in the *Teko ideophones* collection on the Ortolang platform.[7] They code for a large number of features. Most of these features, such as root structure, monovocality, reduplication, or types of syntactic integration, appeared important on the basis of observation of the Teko data since early data collection began, more than two decades ago (see Rose 2003). Note that some of these features happen to have been discussed in the subsequent general literature on ideophones, such as the unusual phonotactics in Yurakaré ideophones (Gijn 2010), reduplication in Japhug ideophones (Jacques 2013), monovocality in Japanese ideophones (Akita et al. 2013), and types of syntactic integration of Siwu ideophones (Dingemanse 2017). Other features coded in the databases are directly taken from the literature on ideophones in other languages, such as for example, deideophonic derivation (Reiter

[6] Affixes and clitics/particles have been excluded from the total number of entries in order to yield the number of lexical roots, and proper names have been excluded from the count of nouns, for both dictionary and Toolbox lexicon. Moreover, borrowings have been excluded from the count of nouns and verbs, for the Toolbox lexicon only. Nouns and verbs in the dictionary are overestimated because the roots with several sub-categories (such as intransitive verb and transitive verb) were counted several times.

[7] https://hdl.handle.net/11403/teko-ideophones/v1

2011: 325-334), or the semantic motion grid for ideophones developed for Basque ideophones (Ibarretxe-Antuñano 2019).

1.4.1. The Ideophone type database

The *Ideophone type database* lists all known Teko ideophones up to date. For this, the 108 ideophones in my lexicon and the 130 ideophones from the dictionary (Cachine et al. 2020) have been merged and their orthography made consistent.[8] This yields a list of 177 ideophones. It is not meant to be definitive or comprehensive, but rather to reflect the present stage of analysis of potential ideophonic words.

These have been systematically coded for the features listed below, in the following order:

- Form, ID, and Phonological transcription
- Source, i.e. *Dictionnaire Teko* for Cachine et al. (2020) and/or *Toolbox Lexicon* for Rose (2018)
- Variants and derivation (3 features)
- Root structure
- Initial consonant, medial consonant(s), final consonant, vowel(s)
- Exclusively /ɾ/ in medial position, Monovocality
- Syntactic constructions (4 features)
- Provisional gloss
- Semantic categorizations (4 features)
- Motion semantic grid (26 features)

[8] Ideophonic forms that were phonetically close and semantically related have been merged as one unit (see *pu* and *fu*; *tou*, *to* and *tuu*). Complex forms showing the repetition of the exact same sequence in what seems to be a multimorphemic word in the source have been treated as the repetition of a simpler ideophone (such as *tuŋ* for *tuŋtuŋ*). What was obviously a reduplicated form of a more basic ideophone was not treated as a separate entry (such as *dururug* from the dictionary, compared to *durug* from the Toolbox lexicon). In all cases, the form taken as the reference form in this study is the simplest form of each ideophone to the best of my knowledge. Some doubts remain on the identification of some of the listed items as ideophones (*ãhã* could be an interjection), on the relation between various items (is *tititig* a variant of *tig* ?), and on what is the basic form of some ideophones (should we consider that *woroworoʤ* is built on a putative basic form *woroʤ* ?). These questions could be solved with access to more data or speaker's intuitions.

1.4.2. The Noun, Verb and Ideophone database

In order to compare the form of the ideophones listed in the *Ideophone type database* with that of nouns and verbs, a dataset of nouns and verbs has been put together. The list was extracted from the Toolbox lexicon (Rose 2018), excluding proper nouns and borrowings. It consists of 541 nouns and 270 verbs. It is complemented by the list of ideophones, transcribed phonologically.

Each item has been coded manually for parts-of-speech, root structure, monovocality, /ɾ/ in word-internal position.[9]

1.4.3. The Ideophone token database

The *Ideophone token database* is a sample of 101 audio-recorded occurrences of ideophones extracted to investigate the use of ideophones in speech, especially their prosody.[10] The examples have been extracted from the text corpus, mainly narratives and one expository text. For each token, the *Ideophone token database* provides information about:

- ID, Form, Example number
- Reduplication and its meaning (2 features)
- Series of ideophones (3 features)
- Syntactic integration (5 features)
- Sentence type other than declarative
- Pause duration before and after ideophones

1.4.4. Vowel results

The *Ideophone token database* database is complemented by a sheet called *Vowel results* giving the prosodic characteristics (duration, intensity and pitch) of the 183 vowels of the 101 ideophone tokens.

[9] These columns are not filled for ideophones in this database, as the information is already coded in the *Ideophone type database*.

[10] All ideophone tokens from the audio files of spontaneous speech were extracted, following the chronological order of the recordings, until a hundred tokens were reached. It happens that the very great majority of tokens have been extracted from a single text with a single speaker.

2. Phonology

This section compares the frequency and distribution of individual phonemes in ideophones, nouns and verbs. This comparison is based on the *Noun, Verb and Ideophone database* using the tool StatMe that allows an easy investigation of the frequency of phonemes in a list of linguistic items.[11]

2.1. Introduction to the phonology of Teko

The inventory of consonants and vowels is given in Table 2 and Table 3**.** Phonetic realizations are specified in brackets using the IPA notation.

	labial	alveolar	palatal	velar	labio-velar	glottal
voiceless non-continuant	p [p, pˀ]	t [t, tˀ]	ʧ [ʧ, ʧˀ]	k [k, kˀ]	k^w	ʔ
voiced non-continuant	b [b, ^{m}b, m]	d [d, ^{n}d, n]	ʤ [ʤ, ɲ]	g [g, ŋ]		
voiceless continuant		s [s, ts]				
voiced continuant		z [z, dz]				
non-obstruent	w [w, ß, w̃]	ɾ [ɾ , ɻ, n]	j [j, j̃]			h [h, ɣ, h̃]

Table 2: Teko consonantal inventory.

	front	central	back
closed	i, ĩ	ɨ, ɨ̃	u, ũ
mid	e, ẽ [e, ɛ]	ə	o, õ [o, ɔ]
open		a, ã	

Table 3: Teko vowel inventory.

In word-initial position, all consonants but /g/, /j/ and /ɾ/ are found. In word-internal position, all consonants are found, but /g/ is restricted to morpheme-final position. In word-final position, only non-continuants are found, and are then either unreleased [pˀ], [tˀ], [tʃˀ] and [kˀ] or nasalized. Unreleased consonants have been analyzed as voiceless non-continuants, and nasal consonants as allophones of voiced non-continuants in Rose (2008).

[11] StatMe is a free access tool doing simple counts on the distribution of units in lexicon https://reflex.cnrs.fr/STATme.

Nasality in Teko results from regressive harmony within roots (and diffusion to adjacent affixes) affecting all voiced segments without being stopped by voiceless segments. Nasality diffuses from either nasal vowels as in /tɨakã/ [tɨãkã] ‘river’ or voiced non-continuants, which are phonetically realized nasal in word-final position as in /abad/ [ãmãn] ‘rain’ and prenasal in intervocalic position as in /kadetat/ [kãndetatⁿ] ‘crown’.

In the writing system used in this paper (outside of phonemic and phonetic transcriptions), nasal consonants are written as such, nasal vowels are marked with tilde only when phonemically nasal, and final unreleased consonants are written as voiced consonants.[12]

2.2. Phonemic inventory in ideophones

The phonemic inventory used in ideophones is overwhelmingly very similar to that used in the rest of the lexicon and grammatical elements. There are two sounds that are not part of the regular phonemic inventory and that are each found in only one (variant of) ideophone: [ʃ] in /tiʃ/ ‘grease dripping on fire’ and [f] in /fu ~ pu/ ‘blowing’.[13]

2.3. Phoneme frequency and distribution in ideophones

Phonemes follow the same restrictions in distribution in ideophones as in the language in general. The consonants /g/, /j/ and /ɾ/ are not found root-initially, /g/ is not found root-internally either. Only non-continuants fill the root-final position. Notable exceptions are the presence of /h/ word-finally in two ideophones only, as in /puh/* ‘shaman blowing’, as well as one example with /ʃ/ (/tiʃ/, see 2.2).

The systematic comparison of ideophones with nouns and verbs nevertheless allows us to spot some differences in the frequency of attestations of phonemes across word classes.

All vowels are found in ideophones, with /u/ and /o/ being the most frequent (> 20%) and /e/ and /ə/ the least frequent ones (< 10%). Most notably, /o/ and /ə/

[12] All known writing systems note nasal consonants as such, and nasal vowels in a less systematic way. Final unreleased consonants are either written with symbols for voiceless consonants, as in the dictionary (Cachine et al. 2020), or with symbols for voiced consonants to ensure a unique root form whatever the morphophonological context, as in the grammar (Rose 2008).

[13] Both sounds are found in borrowings.

are much more frequent in ideophones than what is expected from their number in the overall lexicon (+95% and +92% respectively) and /a/ is less frequent (-54%).

All consonants are found in ideophones as well, with the most frequent ones (>10%) being the voiceless non-continuants /p, t, k/ and /ɾ/. The voiceless non-continuants /p, t, k/ are the most frequent initial consonants (all together they make up half of initial consonants), /ɾ/ is only found in medial position, and the velar consonants /k, g/ realized [k˺, ŋ] are the most frequent final consonants (they make up about 70% of the final consonants). Some of these distributional facts will be discussed again in the remainder of the paper. In comparison with the rest of the lexicon, voiced non-continuants in general are less frequent (-75% from the expected distribution of consonant classes regardless of parts-of-speech).

2.4. Nasality in ideophones

Nasality in ideophones mostly follows the same distribution as in the rest of the lexicon. In the following ideophones, nasality spreads from a voiced non-continuant to all voiced segments on the left:

(2) */kɨbok/ [kɨ̃mbok˺]**
'swallowing, desiring'

(3) */bedaʤ/ [mẽnãŋn]**
'sticking the tongue out'

A few ideophones do not follow the expectations regarding nasality. The voiced non-continuant in (4) and the /ɾ/ in (5) and (6) are expected to be fully nasalized, but are not.[14]

(4) */dub/ [ndũm]*
'extremely loud noise (e.g. thunder)'

(5) */biɾibibig/ [miɾimimĩŋ]**
'liquid dripping softly'

(6) */tairikikid/ [tairikikin]**
'disappearing'

[14] Other ideophones seem to diverge from the regular application of nasality, as visible in the absence of the tilde on vowels and /w/. In the absence of audio recordings for these items, this inconsistency could also be simply attributed to too broad a transcription.

Finally, it is interesting to note that out of the nine ideophones comprising a glottal non-obstruent /h/, six show nasal vowels. This association is sometimes called "rhinoglottophilia" (Matisoff 1975).

(7) */hã/*
'moving apart, opening'

To summarize this section, the phonology of ideophones almost always conforms to the usual phoneme inventory and restrictions in distribution. The distribution of particular phonemes in certain positions cannot serve as a defining criterion to identify ideophones, but nevertheless hints at the likeliness of an item being an ideophone. This skewed distribution is congruent with the foregrounding strategy for marking Teko ideophones in Akita (2021)'s terminology. For instance, the words in (8) and (9) conform to the prototypical phonology of ideophones.

(8) */kog / [kõŋ]*
'snoring'

(9) */turuk/ [turuk˥]*
'stepping down'

3. Root structure

3.1. Introduction to the Teko root and word structure

Attested syllabic structures are quite simple in Teko: CV (by far the most frequent), V, CVC and VC. The maximal word pattern is made of a sequence of open syllables, with a closed syllable allowed in morpheme-final positions only. Each vowel of a vowel sequence is the nucleus of a separate syllable.

The quantitative analyses in this section are based on the information about root structure coded in the *Ideophone Type database* for ideophones, and in the *Noun, Verb and Ideophone database* for nouns and verbs. For each feature observed, a 3-sample chi-square test for equality of proportions was used to compare the observed distribution with a uniform distribution. Then post-hoc pairwise comparisons were carried out with p-values adjusted for multiple testing based on Holm's method.

3.2. Root structure

Teko ideophones comply with the general structure of Teko roots. They make use of all allowed syllabic structures and only those. As monomorphemic words, they also follow the general word pattern. Only two items within the *Ideophone type database* contain a consonant sequence, which elsewhere is normally the result of morphological make-up. [15] One of these exceptions is potentially the repetition of a shorter ideophone (for which I have no evidence) (10), while the other is debatably not an ideophone. The form in (11) is used to render a song. Aplonova et al. (2022) have shown that in West African narratives, forms used to render songs, music or foreign languages (that they call 'pseudo-words' following Idiatov 2005) differ structurally from ideophones.

(10) *saŋsaŋ**
'chewing'

(11) *zinzawa*
'singing'

We have just seen that ideophones show root structures that are consistent with the Teko linguistic system. Nevertheless, their internal structure shows some of the allowed features much more frequently than roots of other word classes. This makes particular forms more likely to be identified as ideophones and the whole set to be distinguishable as a class of roots. Table 4 compares the root structure of ideophones, nouns and verbs in Teko.

	monosyllables	initial V	final C	$(CV)^n.CVC$
ideophones	44%	3%	68%	64%
nouns	6%	25%	34%	21%
verbs	16%	11%	58%	46%

Table 4: Root structure of Teko ideophones, nouns and verbs.

[15] Rose (2011) was mentioning the ideophonic form *mankurug* as being unexpected due to the root-internal consonant sequence. Since then, it has been analyzed as a sequence of ideophones, based on the independent attestation of the ideophone *kurug* with a close meaning.

Regarding monosyllabicity, the observed distribution is significantly different from a uniform distribution ($\chi^2(2) = 140.56$, $p < .001$). Comparisons show that ideophones are statistically much more often monosyllabic than nouns ($p < .001$) or verbs ($p < .001$).

Regarding the presence of an initial vowel, the observed distribution is also significantly different from a uniform distribution ($\chi^2(2) = 54.213$, $p < .001$). Ideophones start with a vowel statistically less often than nouns ($p < .001$) or verbs ($p = .004$).

As for the presence of a final consonant, the observed distribution is again significantly different from a uniform distribution ($\chi^2(2) = 82.926$, $p < .001$). Ideophones end with a consonant statistically more often than nouns ($p < .001$) or verbs ($p = .031$).

To summarize the general findings on ideophone root structure up to now, ideophones are monosyllabic statistically much more often than nouns or verbs, start with a vowel less often than nouns and verbs, and end in a consonant more often than nouns and verbs. In more specific terms, ideophones more often than nouns or verbs follow a structure made up of a final closed syllable possibly preceded by a series of open syllables, all syllables having a simple consonant onset: $(CV)^n$.CVC, as shown in the last column of Table 4. The observed distribution is significantly different from a uniform distribution ($\chi^2(2) = 123.41$, $p < .001$). Comparisons show that ideophones follow this structure statistically more often than nouns ($p < .001$) or verbs ($p < .001$). The following ideophones illustrate this prototypical structure.

(12) *seg*
'sitting'

(13) *tapug*
'diving'

3.3. Monovocality and internal /ɾ/

Other structural properties are strikingly more frequent in ideophones than in nouns or verbs, as shown in Table 5 on the subsets of multisyllabic items of each class.

	monovocality	internal /ɾ/only
ideophones	48%	33%
nouns	16%	6%
verbs	26%	8%

Table 5: Additional structural properties of ideophones, nouns and verbs.

The first property is monovocality, defined by the exclusive presence of a single quality of vowels throughout the root (disregarding nasality). This property is found in half of the multisyllabic ideophones, such as those in (14) and (15).

(14) *ponoŋ*
'going out'

(15) *korokokor*
'tearing'

The observed distribution of monovocality across parts of speech is significantly different from a uniform distribution ($\chi^2(2) = 52.428$, $p < .001$). Ideophones are monovocalic statistically more often than nouns ($p < .001$) or verbs ($p < .001$).

The second property is the exclusive presence of /ɾ/ as a consonant root-internally (occurring a single or multiple times), found in a third of the multisyllabic ideophones. This is exemplified in (16) and (17).

(16) *kɨrog*
'swallowing'

(17) *purɨg*
'extricating'

The observed distribution of the exclusive presence of /ɾ/ as a root-internal consonant is significantly different from a uniform distribution ($\chi^2(2) = 52.428$, $p < .001$). Comparisons show that ideophones display only /ɾ/ as a consonant root-internally more often than nouns ($p < .001$) or verbs ($p < .001$).

These two properties of multisyllabic ideophones are found combined more often in ideophones than in nouns and verbs (Chi2 test, $p < .05$). They are dealt with together in this section because they associate in ideophones more than expected from their distribution ($\chi^2(1, N = 99) = 14.74$, $p < .001$). Examples are (18) and (19). The literature on vowel harmony does not mention a special role of flaps in vowel harmony (van der Hulst & van de Weijer, Jeroen 2011).

(18) *kurug*
'handling with hands or paws (grasping, digging)'

(19) *pururu*
'group falling'

A hypothesis to make sense of this strong association would be that multisyllabicity, monovocality and the exclusivity of internal /ɾ/ together result from a particular morphological process, a type of reduplication adding more syllables to a root but substituting a default /ɾ/ consonant in the copy in lieu of the original onset consonant. There is no indication that r-sounds or liquids are regularly used as fixed consonants in reduplication, but at least this pattern is attested in Malak Malak (Birk 2015: 95-96) and Somali (Dhoorre & Tosco 1998).

Monovocality in ideophones has been interpreted as expressing the regularity of the event (Dingemanse 2011). A further hypothesis would be that the use of a default consonant also participates in expressing this regularity. In the particular case of (20), while the plain form *kʷəg* may be used for a simple jump of a frog or a monkey, the more complex form *kʷərəg* refers to a sub-event (a step) in climbing a tree or in walking up stairs, for example. These steps are more complex events than simple jumps, and are furthermore often part of a sequence (itself rendered by the repetition of the ideophone). If this hypothesis was confirmed, this would mean that many items that have been up to now considered the basic form of ideophones would in fact be derived from a simpler form, unattested in the (limited) sources.

(20) *kʷəg, kʷərəg*
'jumping up, climbing'

To summarize this section, the structure of ideophones is not aberrant within the Teko linguistic system but regularly shows some features that are particularly representative of this class of words. This is another contribution to the foregrounding strategy for marking Teko ideophones, following Akita (2021)'s terminology.

4. Word-level prosody

Ideophones are often presented as being set apart prosodically by pauses, pitch or non-modal phonation (see for example Dingemanse & Akita 2017; Mihas 2012). They can also show a different stress pattern (Reiter 2011: 297; Mihas 2012). They are also said to be easily manipulated prosodically for expressivity (Samarin 2001: 333). For example, Reiter (2011: 297-308) describes how variation in pitch, intensity and rhythm in Awetí ideophones can be used expressively in speech to modify the basic meaning of the ideophone.

The description of word-level prosody in ideophones presented in this section is based on a prosodic analysis of the 183 vowels from the items of the *Ideophone token database* (see *Vowel results*). Excerpts from audio recordings of discourse data were manually annotated in Praat (Boersma & Weenink 2023) for vowels and pauses before and after the ideophone (if need be).[16] Then the duration of the pauses and the pitch, mean intensity and duration of the vowels were extracted from them. Pitch was extracted at the beginning, end and at the first, second and third quartiles of the vowel length. The results, made available in the *Vowel results* sheet, were systematically compared to the analysis by Gordon & Rose (2006) of regular discourse data, which included both content and function words.[17]

4.1. Introduction to Teko prosody

Gordon & Rose (2006) investigate stress in Teko. Other aspects of Teko word-, phrase- or utterance-level prosody have not been investigated. The domain of stress is the prosodic phrase. Primary stress usually falls on the penultimate syllable of the phrase or on the final syllable if heavy. Secondary stress alternates on every second syllable counting backward from the primary stress. Optional stress can also be found on the initial syllable of the phrase. The major acoustic correlates of stress are duration and intensity on words in isolation, and additionally pitch in discourse data (Gordon & Rose 2006).

4.2. Stress in ideophones

A preliminary study on stress placement in ideophones indicates that it does not follow the general rules of stress placement in Teko, and is irregular across the word class.[18]

On disyllabic ideophones, stress either falls on the initial syllable (even when the final one is heavy as in [ˈdiɾɨkˀ] ‘watching’) or on the second one as in [peˈtekˀ]

[16] The smallest pause is 27 milliseconds. Importantly, absence of pause segmentation in Praat was not coded as a zero-millisecond pause for the computation of the median duration of pauses.

[17] Both studies exclude vowels in hiatus and vowels in word absolute final position, as these latter “were often characterized by a gradual shift into non-modal phonation (breathiness or creakiness) that made it difficult to determine their endpoints” (Gordon & Rose 2006). Additionally, nineteen vowels were excluded from our pitch analysis, because the items were glottalized.

[18] To check the transcription of stress placement, a sub-sample of 18 tokens of disyllabic and 6 tokens of trisyllabic ideophones have been submitted to a set of 5 transcribers, showing strong agreement for some items and lack of consensus on others.

'pushing', even when this is light as in [hiˈja] 'walking'. Trisyllabic ideophones are stressed on their initial syllable, as illustrated in [ˈtərərərəkˀ] 'being noisy'. The following figures show the acoustic cues for stress in disyllabic and trisyllabic ideophones. Pitch and intensity are responsible for some prosodic saliency on the initial syllable, while duration highlights the penultimate syllable, as shown in Figure 1 to Figure 3.

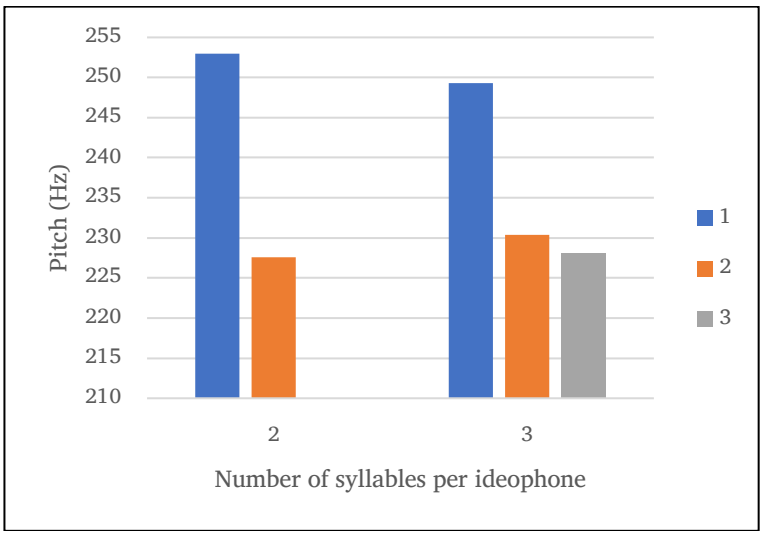

Figure 1. Pitch in disyllabic and trisyllabic ideophones.

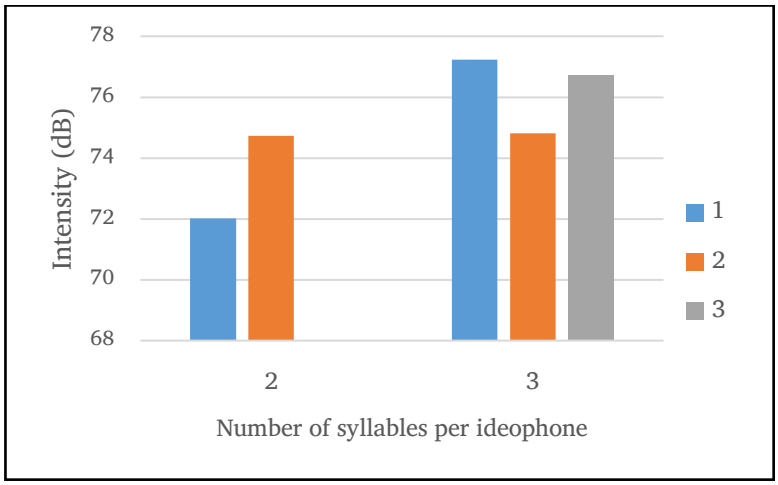

Figure 2. Intensity in disyllabic and trisyllabic ideophones.

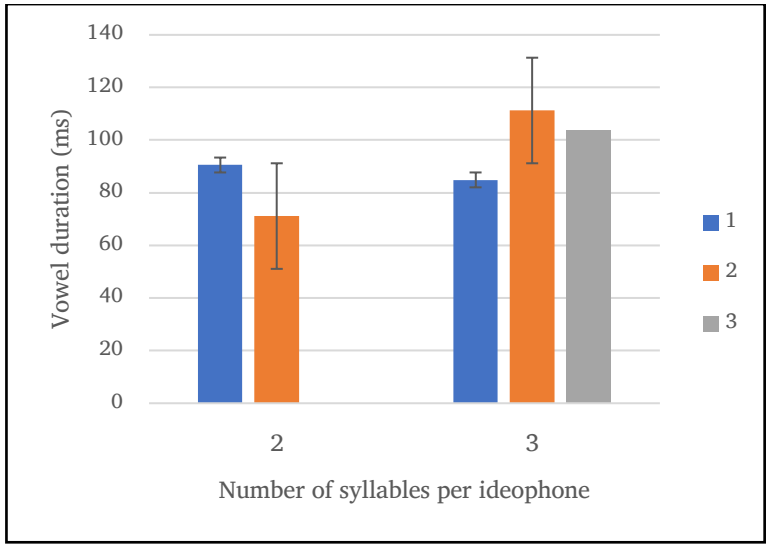

Figure 3. Vowel duration in disyllabic and trisyllabic ideophones.

It is for now unclear whether the unexpected stress placement described in this section as well as inconsistency within the word class could be explained by expressiveness overriding regular rules. We will see next how each prosodic cue compares in ideophones and other words, and can be recruited for expressive purposes.

4.3. Vowel duration in ideophones

The mean vowel duration of vowels in ideophones is in general comparable to the duration of vowels with primary stress in the discourse data, as shown In Table 6. Vowel lengthening is salient in monosyllables.

ideophone token database				Regular discourse data (Gordon & Rose 2006)		
all vowels	monosyllables	disyllables	trisyllables	primary	secondary	unstressed
96	183	83	100	99	85	84

Table 6: Average vowel duration (ms).

It is known from the literature on ideophones that the expressive prolongation of vowels is an iconic means of signifying an extension in space or time (Childs 1994; Reiter 2011). This expressive lengthening is for instance noticeable in the duration (955ms) of the final vowel of an occurrence of *pururu* 'moving collectively', probably expressing in that case the temporal and spatial extension of people falling from a

high tree due to height and number of people. Nevertheless, it is important to note that expressive lengthening is not limited to ideophones in Teko. Extended vowel duration is found with similar characteristics in parts-of-speech other than ideophones, such as the verb form *ohoŋ* 'they are going', in which the lengthening of the final vowel (857ms) expresses as well the extension of the motion event of two brothers climbing a high tree. In an example of *moŋ* 'being dark', the vowel is extremely long (574ms), and expresses the intensity of this sensory property. It can be compared to the salient lengthening of the attributive *epɨ* 'it is expensive' that often heard in the community as an expression of high intensity.

4.4. Pitch in ideophones

In general, vowels in ideophones show a higher pitch than the surrounding text, as shown in Table 7 (note that the gender of speakers has not been normalized). As was mentioned above, pitch is higher on the first syllable in ideophones and then decreases throughout the word (Figure 1).

Ideophone token database	Regular discourse data (Gordon & Rose 2006)		
all vowels	primary	secondary	unstressed
242	165	168	159

Table 7: Average vowel pitch (Hz).

Some items show particularly remarkable variation in pitch. Salient variation in pitch is found in a similar fashion elsewhere in the language, for example in interjections.

4.5. Intensity in ideophones

On average, vowels in ideophones show a higher intensity than the surrounding text, as shown in Table 8.

Ideophone token database	Regular discourse data (Gordon & Rose 2006)		
all vowels	primary	secondary	unstressed
75.9	67.8	66.2	65.5

Table 8: Average vowel intensity (dB).

Intensity can also be played with to expressively convey the rhythm of an event. For example, the ideophone *tou* can be realized with a regular drop of intensity, expressing motion down and away.

To summarize this section, the word-level prosody of Teko ideophones often makes them salient in discourse, be it through unexpected stress placement, high pitch and intensity, vowel lengthening or variation (or lack of) in pitch or intensity. Playing with prosody enables the speaker to express additional meaning (such as time, intensity, rhythm, etc.). The salience of prosodic properties of ideophones in speech is a major foregrounding strategy for marking Teko ideophones (see Akita 2021).

It is nevertheless important to highlight that this expressive power of prosody is not restricted to ideophones. A challenging endeavor would be to weigh the differential use of expressive prosody in ideophones vs. in other word classes.

5. Morphology

5.1. Introduction to Teko morphology

Teko is an agglutinative language, leaning towards polysynthesis (Rose 2008: 442). It predominantly employs suffixes or enclitics, with only limited prefixation, as shown in (21). There is greater morphological complexity on the predicate, which may also undergo reduplication.

(21) *ere-mo-zaug-a-õwã=zepe=ʔe=po* *mamã, ʤasor ʔ*
2SG-CAUS-bathe-REF-little=CONCES=INTENS=INTER Mum Djasot
'But did you really wash Mum properly, Djasot?' 21.048

Nouns and verbs differ depending on the person prefix sets they combine with. Verbs obligatorily take a person prefix, either from Set I for their subject, or from Set II for their object (Rose 2009). Nouns only combine with Set II prefixes for their possessor (Rose 2002). Adverbs and conjunctions do not combine at all with affixes, and pronouns do not take prefixes. All parts-of-speech combine with clitics (see 6.1 about clitics).

Two types of reduplication processes have been described for Teko verbs (Rose 2005; Rose 2007). They both consist of an exact copy of one or two syllables of the

verb, without their coda (Rose 2005).[19] Monosyllabic reduplication expresses event-internal repetition (including the plurality of participants, as in (22)), while disyllabic reduplication expresses either event-internal or event-external repetition as in (23) (Rose 2007, based on Cusic 1981).

(22) *amõ* *kɨto-kom* *õ-**hẽ-hem**.*
other frog-PL 3-RED-leave
'The other frogs leave.' 13.045

(23) ***õhẽ-õ-hem**=ne* *o-ʔa.*
RED-3-leave=CONTR 3-fall
'He leaves again and falls.' 21.237

5.2. Absence of morphology on ideophones

Teko ideophones do not normally combine with affixes or clitics. Nevertheless, this may not be a strict rule.[20] Morphology is at best a rarity on ideophones.

The absence of obligatory morphology and of any prefix in general makes ideophones highly distinguishable from other lexemes. However, similarly to syllabic and phonological structure, the absence of morphology is not sufficient to identify ideophones. But the presence of morphology (with the exception of valency-changing morphology, see 5.4) is sufficient to exclude the identification of a word as an ideophone. Indeed, when a root which shows many prototypical structural properties of an ideophone such as *karag* (a CVCVC structure, monovocality, internal /ɾ/, a voiceless non-continuant in initial position and a voiced continuant in final position) takes a person prefix because it is a verb or a noun (as in *o-karag* 's/he fries' for example), it diverges from the morphological patterns typical of ideophones.

[19] For monosyllabic verb roots, the domain of disyllabic reduplication also includes the person prefix, as in (22).

[20] The dictionary gives some examples of ideophones with what seems to be bound morphology, but their word boundary criteria are not always congruent with mine. Additionally, I have noted during an elicited session two examples of an ideophone with the interrogative clitic and two with the past clitic. In some published Teko tales (Renault-Lescure et al. 1987), some ideophones are followed by the form *iwər*, which is left untranslated and which I therefore suspect of being a discourse clitic. In the absence of recordings and specific work on this structure, I can only hypothesize that this *iwər* form could be a reduced form of *eʔi=ɨwər* "3S.say=CL" involving the clitic *=ɨwər*, a well-identified clitic whose function is still unclear (see Section 6.2.3 on the verb *eʔi*). Note that the clitic would then not be attached to the ideophone but to the verbum dicendi (see Section 6.2.3).

5.3. Ideophone derivation

It is common to find that several ideophonic words can be related formally and semantically. I consider that this situation results from derivational processes affecting ideophone roots through duplication. Derived ideophonic forms are given in the column "Derived ideophonic form" of the *Ideophone type database*.

The two major processes of derivation are monosyllabic and disyllabic reduplication, disregarding the coda consonant and with the domain of reduplication starting from the left edge, just as in verbal reduplication (see Section 5.1).[21] Reduplication in ideophones may involve other formal modifications unattested in verbal reduplication: the substitution of the original consonant of the reduplicand with /ɾ/ in the copy, as already discussed in Section 3.3, the addition of a vowel word-finally, or the "triplication" of the reduplicand (with a double copy). These different derivation processes are illustrated in Table 9.

ideophone root	meaning	derived stem	meaning	reduplication	modification
*pitiŋ**	shuddering	*pipitiŋ**	intense shaking	monosyllabic	
kʷəg	jumping	*kʷərəg*	climbing	monosyllabic	C → /ɾ/
~~ti~~g[22]	walking (stepping?)	*~~tititi~~g*	group running	monosyllabic	triplication
durug	standing up	*dururug**	standing up	monosyllabic	copy of ɾV non-initial syllable/ or triplication with C → /ɾ/
tir	having buttock up	*titiri**	having buttock up, back arched	monosyllabic	addition of final vowel
*~~ki~~tig**	shaking (head, body)	*~~kiti~~kitig**	nonstop shaking (head, body)	disyllabic	

Table 9. Examples of ideophonic derivation.

[21] Because ideophones are never prefixed, the domain of reduplication is restricted to the initial syllables of the root (compare with footnote 19).

[22] The basic form is not found in my corpus, nor in the dictionary, bur the repeated form *~~ti~~g~~ti~~g* is given in the dictionary with the 'walking' meaning (Cachine et al. 2020: 102).

As far as the semantics associated with these various derivational processes are concerned, they pertain to pluractionality, expressing either plurality of participants, event-internal repetition, increase in duration which turns a punctual event into an activity, increase in intensity, or several of these (mostly aspectual) meanings. There are not enough data to specify whether specific meanings are associated with specific derivational patterns.

5.4. Word-class changing derivation

The grammar of Teko (Rose 2011: 403) asserted that ideophones could not be the result nor the source of derivation. However, the Teko dictionary (Cachine et al. 2020) provides precious information on word-class changing derivation processes involving ideophones, by having non-ideophones derived from ideophones listed as sub-entries of ideophone entries.

First of all, deideophonic conversion to several major lexical classes has been observed. Potential cases are listed in the column "Word-class changing derivation" of the *Ideophone type database*,[23] and examples are provided in Table 10, sometimes showing some formal modifications typical of derived ideophonic forms as described in Section 5.3. Deideophonic roots follow the regular morphosyntactic behavior of their parts-of-speech.

ideophone	meaning	deideophonic root	meaning	part-of-speech
*wur**	moving up	*wur**	move up	intransitive verb
susug	suckling	*susu*	breast	noun
*worog**	feeling a gapin the ground	*woroworog(i)**	be soft (for the ground)	attributive

Table 10. Examples of deideophonic conversion.

Second, the dictionary regularly provides verb stems derived from ideophones through valency-changing morphology, such as the causative *bo-* [*bo* ~ *mõ*] as in (24) or the middle *ze-* as in (25). The resulting deideophonic stems follow the regular morphosyntactic behavior of verbs.[24]

[23] A question mark within parentheses indicates less straightforward cases.

[24] Note that, as will be discussed in 8.3, ideophones lack intrinsic valency. There is therefore no use for valency-changing morphology on ideophones.

(24) *putecʁ o-mo-**kosoŋ.***
bottle 3-CAUS-**IDEO.shaking**
'S/he is shaking the bottle.' (Cachine et al. 2020: 62)

(25) *-ze-kũ-**menaŋ***
MID-tongue-**IDEO.sticking_out_tongue**
'Stick the tongue out' (Cachine et al. 2020: 72)

Actually, Teko valency-changing morphology has long been recognized for its potential to combine with various classes of roots, including verbs and nouns (Couchili et al. 2002; see also chapter X of Rose 2011). In all cases, the resulting predicates behave morphologically as verbs. Consequently, ideophones constitute a regular lexical class, subject to verbalization.

6. Syntax

6.1. Introduction to the syntax of Teko

Teko can best be described as a verb-final language. The predicate is the only obligatory constituent. The subject is normally placed before the predicate, and the object may precede or follow it. Adverbs and subordinate clauses are clause initial as in (26).

(26) *pitaŋ o-kiʁe-r-ehe, takuru-ʔũwĩ*
child 3-be_scared-RELN-because rock-DIM

o-tui-o-maʔẽ-r-ehe o-wur.
3-be-CONT-REL-RELN-on 3-go_up
'Since the child is scared, he goes up on a small rock.' 13.028

Any kind of constituent may be focused by being dislocated to the clause initial position, where it carries second position clitics with various discourse functions (like focus *=te* and interrogative/exclamative *=sipo* in (27)).

(27) *e-men-a=te=sipo iʁe a-ʔu […]!*
1SG-husband-REF=FOC=INTER/EXCL PRO1SG 1SG-eat
'This is my husband I ate!' 21.181

6.2. Syntactic integration of ideophones

I distinguish four types of syntactic integration, presented in the following subsections: holophrastic, collocational, light-verb argument, argument-taking. These four types are presented in Table 11 from the least to the most integrated with the following stretch of speech. In the first two levels, the ideophone is completely independent syntactically. It is optional and has no syntactic interaction with the following clause: it can be considered an extra-clausal element. In the other two levels, the ideophone is part of the clause syntax and cannot be deleted without making the clause ungrammatical.

	status	tokens/101
holophrastic	independent	23
collocational		59
light-verb argument	integrated	9
argument-taking		10

Table 11. Levels of syntactic integration of ideophones.

Ideophones are much more frequently found in their independent uses than integrated, as shown by the figures from the *Ideophone token database* given in Table 11. Note that the same individual ideophone can occur with different levels of syntactic integration (compare for example (28) and (34)).

6.2.1. Holophrastic

The holophrastic use of ideophones covers cases where the ideophone has no syntactic interaction with other elements, and is the sole element to inform on a particular event. It is syntactically optional, in that the rest of the surrounding speech would still be grammatical without it. Nevertheless, it is not optional semantically: its content is highly informative. All in all, it could be considered to form a clause on its own.

In (28), *dirig* depicts a 'watching' situation, which is not expressed elsewhere in the utterance. In the context, the main character of the myth hides near a village to find out (through observation) who is the person cooking for him in secret. He then sees a woman coming out of a monkey skin. The ideophone here makes up a whole clause.

The presence of the focus clitic *=te* on the noun phrase *kaʔi w̃ãĩw̃ĩ* in (28) indicates that this phrase is the first constituent of the following clause.

(28) ***dɨrɨg,*** *kaʔi* *w̃ãĩw̃ĩ-a=te* *o-ɨru* *o-bo-pusug […]*
IDEO.**watching** macaque woman-REF=FOC 3-clothe 3-CAUS-take off
'He watches, the female macaque is taking her clothes off.' 23.018

The event depicted by a holophrastic ideophone can either be synchronous to the event expressed in the next clause as in (28), or occur prior to it, as in (29). The potential participants of the event depicted by the ideophone are not expressed explicitly, but can be identified based on the preceding stretch of text.

(29) ***kosokosog*** *o-ze-pihig* *eh-oŋ*
IDEO.**moving_to_the_surface_of_the_water** 3-MID-take POSTP-PL.S

o-wur *o-ho* *ehe-oŋ* *ikeʔi.*
3-move_up 3-go POSTP-PL.S then
'So they come out of the water, hold on to it (the tree), and climb it.' 22.053

6.2.2. Collocational

Collocational uses of the ideophones are those where the ideophone co-expresses and specifies an event expressed by a verb in the clause that follows. The presence of the ideophone is syntactically and semantically optional. Syntactically, it is obvious from the placement of second-position clitics on the constituent following the ideophone that the ideophone is extra-clausal. In (30), the first-position constituent is *wɨŋ-a-kom* because it carries the second-position clitic *=ãhã*. Note in passing that because the first constituent is not necessarily the predicate, the ideophone and the semantically-related verb are not necessarily contiguous, as in (30) where they are separated by a subject noun phrase.

(30) ***kʷərəg*** ***kʷərəg*** *wɨŋ-a-kom=ãhã* *o-wur* *o-ho.*
IDEO.**jumping** IDEO.**jumping** DEM-REF-PL=only 3-move_up 3-go
'Only they climb.' 21.208

Ideophones with a collocational verb always occur clause-initially, as in (31). They can occur sentence-medially, as long as they occur at the beginning of a clause, as in

(32). They can be preceded by extra-clausal elements only, like discourse connectors, such as *ko* in (33).

(31) ***surug*** ***surug*** *aʔe-kotɨ=ne=ʔe* *o-nenaŋ-oŋ.*
IDEO.entering **IDEO.entering** DEM-at=CONTR=INTENS 3-enter-PL.S
'They enter at her place.' 21.117

(32) ***[…]pitiŋ*** ***tapug*** *o-por=eʔe* *ʔɨ-b* *o-ʔar-oŋ.*
IDEO.shuddering **IDEO.diving** 3-dive=INTENS water-in 3-fall-PL.S
'Splash, they dive into the water' 04.042

(33) *ko* ***kir*** *o-wir* *o-ʔur.*
then **IDEO.going_off** 3-come.off 3-come
'Then, splash, she falls' 05.032

Semantically, a collocational ideophone contributes to the semantics of the stretch of text less crucially than a holophrastic ideophone. Indeed, it expresses the same event than the verb it collocates with, but with some additional specification in terms of manner, type of participant, or aspect (See Section 8). Most ideophones regularly collocate with the same verbs (column "Verb in collocation" in *Ideophone type database*). This is for example the case of ***dɨrɨg***, found nine times in a collocational use in the texts, each time with the same verb *maʔẽ* 'watch'. Example (34) illustrates this frequent collocation.

(34) ***dɨrɨg*** *o-maʔẽ-katu* *ikeʔɨ*
IDEO.watching 3-watch-good so
'So she's watching well' 21.180

6.2.3. Light-verb argument

In the light-verb construction, the ideophone is introduced by a light verb. These light verbs are generally *ʔe* 'say, make (a noise)' or *baʔe* 'do, make', more rarely *tui* 'be, become'.[25] It has been long recognized that ideophones are often introduced with the verb used in quotative constructions (Güldemann 2008: 280-283). Light verb *ʔe* is illustrated in (35), and *baʔe* in (36).

[25] The verb *ʔe* has an irregular form *eʔi* with a third person subject, and *ere* in the imperative with a singular subject.

(35) *nan = ãhã* ***miŋ*** *e?i-o*
like_this = only **IDEO.closing_eyes** 3.say-CONT
'She (a dead person) closes the eyes then.' 21.044

(36) ***nɨŋ*** *o-ba?e* *e-koti.*
IDEO.winking 3-do 1SG-toward
'He blinked at me.' elicited

The ideophones immediately precede the light verbs, in a usual position for an object. The verb *?e* normally introduces strictly pre-verbal direct speech, as in (37), more rarely a pre-verbal pronominal object as in (38). The verb *ba?e* normally introduces an object noun phrase, which is often but not always pre-verbal (39) and sometimes marked by a translative case marker (40).[26] Ideophones introduced by *ba?e* are always preverbal and never case-marked.

(37) *am* *wane = so* *e?i.*
here fine = INTER 3.say
'"Is it fine here?" he asks.' 01.021

(38) *[…]mati = sipo* *nan* *e?i?*
where = INTER/EXCL thus 3.say
'Where does this sound come from?' 21.161

(39) *kija* *o-ba?e.*
hammock 3-do
'She makes a hammock.' 06.024

(40) *o-ba?e* *pari-am-oŋ.*
3-do boucan-REF-PL.S
'They made a boucan'. 11.025

An ideophone introduced by a light verb is required for the clause to be grammatical. It is internal to the clause, as shown by the presence of a second-position clitic *= ãhã* on the constituent *nan* preceding the ideophone in (35).

[26] The translative case indicates a change of state for the referent of the noun, from non-realized to realized (Rose 2011: 235-240).

In the sources, some ideophones are attested with only one of the light verbs, some with *ʔe* only (such as *sa* 'small rain'), others with *baʔe* (such as *kar* 'cut') and still others with *tui* (*miʔũmiʔũ** 'feeling internal contraction'). However, the same ideophone can combine with several light verbs, as illustrated by the comparison of (41) and (42).

(41)	***moŋ***	*eʔi*	(42)	***moŋ***	*o-baʔe*
	IDEO.darkness	3.say		**IDEO.darkness**	3-make
	'It is dark.'			'S/he turns the light off'	

In general terms, *baʔe* is used when the subject participant exerts some control on the state of affairs expressed by the ideophone, while *ʔe* does not imply control.[27] This semantic contrast can be observed in examples (41) and (42), as well as (35) and (36). As a consequence, *baʔe* is almost exclusively used with animate participants. In contrast, *ʔe* is used with participants of the following types: impersonals as in (41), inanimates (43), animals (44), dead humans as in (35), or living humans with ideophones expressing inner feelings (45), physical reflexes (46),[28] and body actions that involve some control over one's body (47). This distribution reminds us of the connection between ideophones and the middle functions put forward by van Gijn (2010) on the basis of Yurakaré data. Noticeably, imperative clauses often unexpectedly make use of the *ʔe* light verb (see (58)).

(43)	***tiʃ***	***tiʃ***	*eʔi*	*i-ka-wər*	*pari-ʔar-o.*	
	IDEO.fat_dripping	**IDEO.fat_dripping**	3.say	3-fat-?	boucan-on-CONT	
	'Their fat does tish tish (when it drips) on the boucan (wooden grill).' 37.090					

(44)	*zawar=enam*	*ka-ɾ-ehe*	***wog***	***wog***	***wog***	*eʔi.*
	dog=TOP_SW	wasp-RELN-at	**IDEO.barking**	**IDEO.barking**	**IDEO.barking**	3.say
	'The dog barks to the wasps: "wow, wow."' 16.018					

[27] In one example, the ideophone actually depicts the state of affairs of the human object participant of *baʔe*, the subject of which is inanimate. Here *baʔe* seems to have been selected for its causative sub-component, even though the subject does not exert any control over the object.

Wɨu	*mõãhã*	*kuku*	*e-baʔe.*
IDEO.being_dizzy	like_this	manioc_beer	2-make
'The manioc beer made me dizzy.' (Cachine et al. 2020: 119-120)			

[28] My corpus shows several exceptions to this with the ideophones *pur* and *titʃag* for 'farting' being introduced with *baʔe*.

(45) ***Arɨ*** *eʔi = ne = te.*
IDEO.feeling_pity 3.say = CONTR = FOC
'He had pity.' (Cachine et al. 2020: 6)

(46) ***Atug*** *a-ʔe-tanẽ-ãbɨt* *idʒe.*
IDEO.vomiting 1SG-say-DESID-ASSERT 1sg
'I feel nauseous.' (Cachine et al. 2020: 10)

(47) ***Menaŋ*** *eʔi.*
ideo.sticking_out_tongue 3.say
'He sticks his tongue out.' (Cachine et al. 2020: 72)

When ideophones are introduced by the light verb *tui* 'be, become', it seems this adds an inchoative aspect to the event depicted by the ideophone, as in (48) and (49). The notion of control is irrelevant.

(48) ***Wɨu*** *mõãhã* *e-akaŋ* *o-tui.*
IDEO.being.dizzy like.that 2-head 3-be
'My head spinned all the sudden.' (Cachine et al. 2020: 119)

(49) ***tir*** ***tir***
IDEO.with_arched_back,_buttock_up **IDEO.with_arched_back,_buttock_up**
o-u-kotɨ *o-tui.*
3-father-towards 3-do
'They showed their butts to their father.' 32.067

6.2.4. Argument-taking

In its argument-taking use, the ideophone plays the structuring role of a predicate. There is no verb co-expressing the event. The ideophone governs preceding or following patients or oblique arguments, as in examples (50) to (52). In all the examples from the *Ideophone token database*, the subject is inferred from the context or the construction (see for example the prohibitive construction in (55)).

(50) ***peteg*** *o-kuŋa* *t-o-ʔar* *o-ho.*
IDEO.pushing 3-brother PURP-3-fall 3-go
'He pushes his brother to make him fall.' 21.024

(51) ***ponoŋ*** *i-koti* *ki?i.*
IDEO.arriving,moving_out 3-toward so
'So he goes out toward him.' 21.225

(52) ***sirikʒ*** *waita,* ***sirikʒ*** *sapa.*
IDEO.grasping basket **IDEO.grasping** machete
'Hop, a basket, hop, a machete.' 22.200

Remarkably, in a construction where the ideophone takes arguments, second-position clitics still attach to the element following the ideophone. The absence of morphological potential of ideophones is maintained even in cases of tight syntactic integration.

(53) ***sirikʒ*** *i-zebi?a = ne = ?e* ***sirikʒ*** *i-zebi?a.*
IDEO_grasping 3-music = CONTR = INTENS **IDEO_grasping** 3-music
'He takes his music.' 21.149

6.3. Syntactic integration and prosodic integration of ideophones

To study whether the types of syntactic integration sketched above are supported by prosodic integration, pause duration was observed for the items of the *Ideophone token database*. The results are given in the last two columns of the *Ideophone token database.*

First, the pause before ideophones was examined, excluding ideophones that are preceded by another ideophone. Forty-five out of the remaining 56 ideophones (80%) are preceded by a pause, and the median duration of the pause is 753ms. This long duration is not surprising given the fact that most ideophones are found clause-initially. In fact, this number is not too far from the median duration of inter-clause pauses (993ms).[29]

Second, the pause after ideophones was examined, this time excluding ideophones which are followed by another ideophone. In Table 12, the results were split depending on the four levels of syntactic integration sketched above.

[29] This number has been estimated on the basis of a single but long text of about 20 minutes.

	status	presence of pause	presence of pause	median duration of following pause in ms
holophrastic	independent	4/6	67%	422
collocational		17/35	49%	163
light-verb argument	integrated	2/7	29%	143
argument-taking		1/8	12,5%	090

Table 12. Association of prosodic and syntactic integration of ideophones.

Table 12 shows a clear association between the prosodic and syntactic integration of ideophones: the more syntactically integrated ideophones are (i.e. from the top to the bottom rows), the less they are followed by pauses and the smaller the pauses.[30]

Ideophones are rather well-integrated prosodically in the light-verb construction, as in direct speech with the quotative verb (Rose & Vanhove 2007) and in the argument-taking construction (as in VPs), i.e. in the two constructions from which they cannot be deleted without making the clause ungrammatical. On the contrary, ideophones more often form a separate prosodic unit when they are optional and morphosyntactically independent: this supports their analysis as clause-external and does not support the idea that collocational ideophones could be syntactically "adverbial". The present study on pauses and syntactic integration of ideophones nicely complements that on the inverse relation between expressiveness and syntactic integration of ideophones, based on pitch, phonation type, reduplication & lengthening (Dingemanse & Akita 2017): the former focuses on the framing strategy, and the latter on the foregrounding strategy for marking ideophones, in Akita (2021)'s terms.

To summarize this section, it is important to highlight that Teko ideophones show varying degrees of syntactic integration. They are not necessarily extra-clausal.

7. Discourse use

The pioneering literature on ideophones suggested that ideophones were expected to occur in limited discourse environments, due to their expressive nature. For example, Childs (1994: 194-195) stated that African ideophones were generally found in declarative sentences and genres associated with performance. More recent literature

[30] The presence and duration of pauses after ideophones in different syntactic integration patterns cannot be robustly assessed statistically given the small number of tokens in three of the four categories.

accounts for the use of ideophones in everyday speech (for example Dingemanse 2011; Mihas 2012) as well as in various special verbal arts (a list is given in Dingemanse 2012: 665). As for sentence types and negation, it still seems to be commonly assumed that ideophones do not combine easily with interrogation and negation (Kita 1997: 389-391; Kilian-Hatz 2001: 158; Reiter 2011: 355; Dingemanse 2012: 667).

The use of Teko ideophones is certainly not exclusively restricted to some sentence types (7.1) or genres (7.2), but it shows preferences in its distribution. This section will also describe how ideophones often come in series (7.3).

7.1. Sentence types

Teko ideophones are not restricted to declarative sentences. The following examples show ideophones in interrogative (54) and imperative (55) sentences.

(54) ***seg*** *mõ* *s=o-apig ?*
IDEO**.sitting** like_that INTER=3-sit
'Did s/he sit like that?' elicited

(55) *mame* ***tərərəg*** *eʔi* *zawar-a-pe.*
NEG.IMP IDEO**_making_noise** 3.say dog-REF-to
'"Don't make noise", he tells the dog.' 16.042

Ideophones are therefore not just used to depict reality. They can indeed be used for non-realized events, as additionally evidenced by their use in negative clauses such as (56). Examples (56) and (57) also show that ideophones can be used to refer to a state of affairs involving the speech participants.

(56) *kor* *tamadua* ***miŋ*** *d-eʔi-ʤi.*
then giant_anteater IDEO NEG-3.say-NEG
'Then the giant anteater didn't close its eyes.' 29.009

(57) ***miŋ*** *si-ʔe-tar-te-eʔe* *si-posi-ɲ.*
IDEO**.closing_eyes** 1INCL-do-FUT-CL 1INCL-shit-CONT
'Let's do our business with our eyes closed.' 29.005

Proportionally, ideophones are nonetheless found most often in affirmative declarative clauses describing a realized state of affairs. Within the *Ideophone token database*, only two of the 101 tokens of ideophones (essentially from narrative texts) are not used in declarative affirmative clauses: one is found in a negative imperative sentence (55), the other in a concessive conditional clause.

7.2. Discourse genre

It is obvious from observation of language use in everyday life that ideophones are not only used in narrative texts. For example, it is frequent to hear parents addressing their child asking them to put down an object as in (58).

(58) ***pug*** *ere.*
IDEO.**putting_down** 2SG.IMP.say
'Put it down'. elicited

A preliminary investigation of the distribution of ideophones across genres in the text corpus has been carried out. The results are interesting, although one should keep in mind that the corpus was not built with the objective of covering different genres,[31] and these are therefore not equally well represented. In particular, the absence of ideophones in dialogues should not be taken as representative of the genre, because there were only two very short dialogues in the corpus (208 words). For the purpose of comparison, these have been merged with expository texts (2 ideophones out of 1,770 words) into a super non-narrative category in Table 13. A 2-sample chi-square test for equality of proportions indicates that the proportion of ideophones in the narratives of the corpus is significantly greater than the one in non-narratives ($\chi^2(1) = 822.12$, $p < .001$).

genres	ideophones	words	percentage
narrative	419	8,090	5%
non-narrative	2	1,978	0.1%

Table 13. Ideophones in different genres.

[31] Because speakers did not easily accept to be recorded when speaking spontaneously, they were left completely free to choose the content and genre of the speech to be recorded.

Narratives were further categorized into tales (myths and animal fables), historical narratives, personal narratives and rendering of the picture book *Frog, where are you?* (Mayer 1969). The proportion of ideophones in tales was then compared to that in other types of narrative all together in Table 14.[32] A 2-sample chi-square test for equality of proportions indicates that the proportion of ideophones in the traditional tales of the corpus is significantly greater than for those in other types of narrative ($\chi^2(1) = 459.81$, $p < .001$). It seems ideophones contribute to the performance which determines the quality of the telling of a traditional tale.

	ideophones	words	percentage
tale	364	4,709	8%
other narrative	54	3,327	1.6%

Table 14. Ideophones in different types of narrative texts.

7.3. Series of ideophones

Ideophones in natural speech often come in series. Out of the 101 items of the *Ideophone token database*, 45 had been uttered within series of two or more ideophones. Within those, 15 were followed by a different ideophone, and 30 by the same ideophone.

7.3.1. Series of different ideophones

Series involving different ideophones from the *Ideophone token database* involve two to three ideophones, rendering a sequence of events in chronological order. For instance, the series of three ideophones in (59) depicts three successive events involving a turtle stuck in a tree: its shaking to get free, its detachment from the tree, and its fall.

(59) *kor* ***kuʔe-kuʔe*** ***kir*** ***tou***
then **RED-IDEO.wriggling** **IDEO.going_off** **IDEO.falling**
o-wir *o-ʔar* *zawapinim-a-ʔar.*
3-go_off 3-fall leopard-REF-on
'Then it moves and falls down on the leopard.' 05.025

[32] The 'other narrative' category combines 46 ideophones from 2,209 words of historical tales, 8 ideophones from the 645 words of Frog stories, and the absence of ideophones within the 527 words of personal narratives.

7.3.2. Series of identical ideophones

Series involving identical ideophones from the *Ideophone token database* involve up to eight repetitions, and possibly include some items in a derived form (see Section 5.3). Semantic effects of ideophone repetition pertain to pluractionality: either plurality of participants as in (60), or plurality of events as in (61).

(60) ***sɨrɨʤ*** ***sɨrɨʤ*** *pakuʔa […]* *o-ho* *i-kotɨ-ŋ […].*
IDEO.**grasping** IDEO.**graping** banana 3-go 3-at-PL.S
'They take the bananas and go to his place' 04.007

(61) ***pau*** ***pau*** *mokoɲ* *apapu* *iwər*
IDEO_**rifle_shooting** IDEO_**rifle_shooting** two rifle_shooting ?

o-kaŋum *o-ho.*
3-disappear 3-go
'He shot two gunshots and disappeared far away.' 23.065

Event packaging seems tighter in series of identical ideophones than in series of different ideophones (Table 15). A Mann-Whitney U test (aka Wilcoxon rank-sum test) shows that the pauses are significantly longer when ideophones in series are different (Mdn = 0.17) than when there are identical (Mdn = 0.09), U = 231, $p < .001$.

	number of pauses /tokens	percentage of pauses	median duration of following pause (ms)
different	10/15	67%	171
identical	29/30	96%	091

Table 15. Ideophones in series.

8. Semantics

The understanding of the semantics of Teko ideophones is based on the comparison of their uses in the text corpus, discussion during work sessions with consultants, as well as the definition and examples given in the published dictionary (Cachine et al. 2020). As this understanding is highly dependent on the limited amount of data

available, it should be taken as preliminary. It is indeed likely that the actual use of individual ideophones is either more specific or more general than supposed.

The *Ideophone type database* gives a provisional gloss (column "Provisional gloss"), and categorizes each ideophone along sensory modalities, Levin's verb classes and various components of motion semantics (the following four columns). These three attempts to categorize the meaning of ideophones follow different approaches. The first one discussed in Section 8.1 follows a categorization in sensory modalities supposed to be highly relevant for ideophones (Dingemanse 2012: 663). The second approach, followed in 8.2, is a categorization of state of affairs expressed by verbs in English (Levin 1993). This categorization is one of the few comprehensive lists of events available in the literature, and I have taken it as a categorization that would not be biased by our prior knowledge of ideophones, even though I am fully aware that it is itself biased by the morphosyntax and semantics of English verbs. The third categorization, discussed in 8.3, is a typologically-oriented coding system specific to ideophones expressing motion events (Ibarretxe-Antuñano 2019), based on a long history of semantic work on the domain of motion since Talmy (2000)'s pioneering work. After the semantics of Teko ideophones is investigated through these different approaches, Section 8.4. discusses potential phonosemantic characteristics of Teko ideophones.

Before this, a few general remarks are in order. From working sessions with my main consultant, it is clear that ideophones are part of the standard lexicon of the language. They are easily identified as belonging to a particular class of words and their meaning is conventionalized. As such, the meaning of an ideophone can be discussed even when cited in isolation. My consultant is able to offer varied utterances including the investigated form, and referring to diverse situations covered by this form. As a final general note, the depictive function of ideophones is sometimes overtly signaled in discourse by the use of the manner adverb *moɲi* or *moãhã* 'this way, like that' as illustrated in (62).

(62)	***fu***	*moãhã*	*node-peʤu*	*aʔe-a-te*	*node-baʔe.*
	IDEO.blow	like_that	1INCL-blow	this-REF-FOC	1INCL-do

'He blew us, this is what made us.' 02.021

8.1. The sensory modalities hierarchy

On the basis of previous publications, some generalizations have been made as to which semantic areas are usually covered by ideophones. These have been summarized in an implicational hierarchy, presented in Figure 4.[33]

SOUND < MOVEMENT < VISUAL PATTERNS < OTHER SENSORY PERCEPTIONS < INNER FEELINGS AND COGNITIVE STATES

Figure 4. Sensory modalities implicational hierarchy for ideophones (following Dingemanse (2012: 663)).

The implicational hierarchy should be read as follows: "if a language has ideophones at all it will have at least ideophones for sound (i.e. onomatopoeia). If a language has ideophones for movement it will also have ideophones for sounds. If a language has ideophones for visual patterns (e.g. spatial configuration or surface appearance), it will also have ideophones for movements and sounds, et cetera. Conversely, a language that does not have ideophones for sounds or movements will not have ideophones for cognitive states" (Dingemanse 2012: 663).

I have attempted to categorize Teko ideophones into the different levels of the hierarchy (see column "sensory modalities" of *Ideophone type database*) in order to assess the validity of this implicational hierarchy for Teko data. Two main difficulties were encountered. First, the categories in the hierarchy are not exclusive, as many ideophones can be said to depict both movement and sound. These were coded as depicting movements, while those that have been coded as depicting sounds clearly do not entail movement. Second, the categories are not exhaustive. Many ideophones indeed do not fall into any of the proposed categories, without having an unreasonably wide understanding of movement, or arbitrarily considering sound as their primary component. Consequently, an additional category labelled "action other than movement" was created. Most ideophones in this category depict actions to which a sound can often be associated, but not necessarily. Examples for all semantic

[33] McLean (2021) offers a revised version of this hierarchy in the light of Japonic data, in which the steps VISUAL PATTERNS < OTHER SENSORY PERCEPTIONS of the hierarchy are replaced by FORM < TEXTURE < OTHER SENSORY PERCEPTIONS. This proposal is not relevant for the present Teko data, in which no ideophone for "form" and "texture" has been documented.

areas are given in Table 16, as well as the number of ideophones from the list categorized in these areas.

SEMANTIC AREA	sound	movement	visual patterns	other sensory perceptions	inner feelings and cognitive states	action	others
COUNT	26	70	3	5	5	58	10
EXAMPLE	*woŋ*	*peteg*	*wo*	*tiriri*	*arɨ*	*pig*	*kodʒ*
TRANSLATION	'whistling'	'pushing'	'light'	'slightly spicy'	'feeling pity'	'(un)covering eyes with hand'	'in a short time'

Table 16. Ideophones and semantic areas.

Table 16 shows that all semantic areas traditionally covered by ideophones are relevant to the analysis of Teko ideophones. Yet sound and especially movements are clearly dominant areas, while ideophones related to other senses are much less common. While this distribution does not contradict the implicational hierarchy, the fact that the additional 'action' category groups almost a third of the ideophones in the list points to the fact that the categories within the hierarchy are not cross-linguistically consistent.

8.2. Levin's verb classes

Following the results from the previous section, it seemed important to focus on the action and movement categories and account for all types of events. The labels of the 49 classes of English verbs identified by Levin (1993) for English on semantic and morphosyntactic grounds were useful in offering a first categorization of Teko ideophones in terms of event type (see column "Levin's categorization" of *Ideophone type database*), since most of them involve some dynamicity or change of state, just like verbs in English.

The list of 177 Teko ideophones can be distributed into 26 of Levin's 49 classes, but only three classes are heavily populated: 20 ideophones for "emission", 24 "involving the body", and 46 "motion". Other classes with at least five elements are

the following: “assuming a position”, “change of state”, “contact by impact”, “cutting”, “ingesting”, “perception”, and “removing”.

The three major classes of ideophones according to this categorization can be examined in detail and compared to the results of the previous section (a detailed subcategorization for these major classes is offered in column “Levin's subcategorization” of the *Ideophone type database*. Ideophones of emission mostly include emission of sound, but also light, and substance.[34] With the addition of five ideophones for “sounds made by animals”, they more or less correspond to sound, and visual patterns in the sensory modality classification. Ideophones “involving the body” include bodily processes, non-verbal expression, gestures/signs involving body-parts, body-internal states of existence and verbs of bodily state and damage to the body. This class does not correspond neatly to the sensory modality classification. Finally, the difference between the 46 ideophones of motion in this section and the 70 movement ideophones identified in the preceding section stems from the fact that the latter comprise not only motion semantics, but also caused motion and change of posture, which in Levin’s finer categorization pertain to other classes.

8.3. The motion semantic grid

The motion semantic grid for ideophones developed by Ibarretxe (2019) proposes a number of variables to break down the motion semantics into components associated with the figure, the ground, the path, the manner, the cause, the event extension (phase or aspect), and whether the motion is movement (translocation) or stationary. All 70 ideophones coded as expressing movement in Section 8.1 have been coded for these components (the last 26 columns of the *Ideophone type database*)). Two types of information can be extracted from this coding: which semantic components of motion are lexicalized in some ideophones, and which specific semes are found for each relevant component.

Regarding the figure of motion, only two motion ideophones clearly involve the number of the figure (*pororo* ‘group leaving and spreading out’, *pururu* ‘falling collectively’) while others are neutral in that respect. As an example, the ideophone *tapug* ‘diving’ depicts the diving of one or several bodies (compare (63) with (64)). Repetition of the ideophone is often used to express the plurality of participants (65).

[34] None of the Teko ideophones have been considered to express emission of smell, though the three ideophones for ‘farting’ could be analyzed as such. They have been coded as ‘bodily processes’ in the database.

Ideophones are generally neutral in terms of number of figure even when the verbs that the ideophone associates with lexicalize the number of participants, as the verbs *ike* 'enter' and *nenaŋ* 'enter as a group' that are found in collocational constructions with the ideophone *surug* 'entering' (compare (66) with (67)).

(63) ***tapug*** *iwər* *tɨhãkã-pope* *o-mobor.*
IDEO.diving ? cove-in 3-throw
'He threw (the creeper) in the cove.' 24.013

(64) ***tapug*** *ze-kapɨrer=ne* *ʔɨ-b* *o-po-por* *o-ho-oŋ.*
IDEO.diving RECP-behind=CONTR water-in 3-RED-jump 3-go-PL.S
'Splash, they dive in the water one after the other and go away.' 04.035

(65) ***tapug*** *i-pope=ne* *oʔa-o-ʔar-oŋ* ***tapug*** ***tapug.***
IDEO.diving 3-in=CONTR RED-3-fall-PL.S **IDEO.diving** **IDEO.diving**
'Splash, they go (lit. fall) in it (the stomach of the tapir), splash, splash.' 04.024

(66) ***surug*** ***surug*** *aʔe-kotɨ=ne=ʔe* *o-nenaŋ-oŋ.*
IDEO.entering **IDEO.entering** DEM-at=CONTR=INTENS 3-enter-PL.S
'They go back home (to the Tebesig).' 21.117

(67) ***surug*** *moŋi* *bato* *o-ike* *o-ho* *ʔɨ-b.*
IDEO.entering this_way boat 3-enter 3-go water-in
'The ship enters under the sea.' 37.015

As far as the animacy of the figure is concerned, it is often neutralized in motion ideophones (and other ideophones as well). For instance, the diving process expressed by the ideophone *tapug* is realized by an inanimate participant, a creeper, in (63) and by animate participants, girls, in (64) . As for the entering process expressed by the ideophone *surug*, it can be realized by animate participants, like the boys in (66) or by an inanimate participant, such as a ship in (67). As noted in Rose (2011), the figure of *tou* 'moving straight in the air, vertical or horizontal, until contact' (often used for falling) in the sources is in turns a turtle, a monkey, people, and seeds, and the figure of *sɨrɨʤ* 'grasping' (not classified as a motion ideophone) is successively fruits, seeds, water, artefacts, small animals, an anaconda, a sloth and a sick human being. However, a number of motion ideophones are likely specific to animate figures, for example those expressing 'walking' and body-internal motion like 'startling'.

Finally, a few ideophones are specialized for specific figures. These are either weapons as in *pa* 'arrow shooting', *pau* 'rifle shooting', or *tokoŋ* 'bait hitting the surface of the water', or liquids as in *piripipig* 'dripping', *so* 'water falling', or *tuɲ* 'water pouring'. This clearly reflects the importance of hunting and fishing and of rivers in the life of this Amazonian ethnic group. Liquid is also often a component of motion ideophones as a ground, along with solid and gaseous ones.

The path component of motion ideophones consists essentially of direction, with a wide variety of possible orientations: 'away, off, to, in, out, up, down, towards' or a combination of those. By contrast, ideophones are notably all neutral in terms of deixis. In the corpus, the ideophone *hija* 'walking' collocates with three verbs encoding different deixis: *ʔur* 'come', *kʷa* 'pass, leave' and *zewɨr* 'come back'. In the examples (67) and (68), the ideophone *surug* 'enter' collocates with both centripetal and centrifugal verbs *ho* 'go' and *ʔur* 'come'. This is evidence that these ideophones do not lexicalize deixis.

(68) ***põ*** ***surug*** *o-ʔur=eʔe* *ea-pope* *o-ike*
IDEO**.going_in_air** IDEO**.entering** 3-come=INTENS eyes-in 3-enter
'Bang! The eyes come back and return to their place.' 29.051

As for manner, the only component which is easy to identify is the motor pattern. Salient motor patterns are body motion (for stationary motion, such as *kɨtɨg* 'shaking head or body', *kɨrɨg* 'moving continuously as if one were stung multiple times', *kuʔe* 'wriggling', *patab* 'shaking oneself (to get dry/clean)', *pitiŋ* 'shuddering', *tɨrɨg* 'startling', and *wɨʤ* 'arms winding'), walking (with four ideophones for 'walking': *sokoʤ*, *soso*, *tɨg* and *tog*) and jumping (*por* and *potiŋ* 'jumping', *sarag* 'bouncing'). They are fewer verbs for these motion events: for example, there is a single verb *wata* for 'walk' in the sources.

Finally, there seems to be no extension component for phase or aspect in Teko motion ideophones, and they generally neutralize the presence or absence of a cause. As such, they can depict monovalent or bivalent events, and therefore correspond to both intransitive and transitive verbs (see also Kunene (2001: 188)). Examples (63) and (64) show that the ideophone *tapug* can depict the diving of an entity controlling their motion or being thrown into water (the verb *mõbor* 'throw' is the causativized version of *por* 'jump'). Most motion ideophones are found in the corpus expressing either spontaneous motion or caused motion. This lack of intrinsic valency applies to

ideophones with other semantics as well, and is often made clear by the valency of the verb in collocation.

To summarize, ideophones express events, as do verbs, but they do so in different ways, lexicalizing different semantic components from particular verbs. They can lexicalize information on the event itself, its manner, its spatial configuration, the participants, and the ground (see also Nuckolls (2021)).

8.4. Phonosemantic characteristics of ideophones

"Sound-symbolism is the direct linkage between sound and meaning" (Hinton et al. 1994). Phonosymbolism has been described as a property of at least some ideophones, consistent but not automatic and universal (Childs 1994: 194; Dingemanse et al. 2016; Nuckolls 1999). Some authors have tried to establish it as a rigid system where each vowel and each consonant could be given an iconic meaning, covering the whole range of ideophones (Langdon 1994; Egbokhare 2001). This endeavor does not seem realistic for Teko ideophones.[35]

Several methodological issues emerged when seeking to uncover and weigh any phonosemantic characteristics of Teko ideophones. The first was that it was not technically possible with the database available to compare ideophones with verbs and nouns, since they were not coded for semantics. Taking the stance that a study on phonosemantics focusing on ideophones alone should be sufficient, it then also proved difficult to weigh the frequency of association of a phonological feature and a semantic feature within the list of ideophones. The idea was then to compare the proportion of ideophones with both a particular phonological and a particular semantic feature to the number of ideophones with only one of those in the list, i.e. comparing for example how many ideophones start with /p/, how many depict an event involving the 'hand' and how many associate both features, to evaluate whether this association is significant. In all cases, a statistic analysis seemed unlikely to be fruitful, the semantic features being either coded on a small number of items, or not coded, because the list of coded semantic features was limited. Adding ad-hoc semantic features while carrying out a phonosemantic analysis would have been very subjective and circular. For these reasons, this section will only offer some preliminary insights into likely phonosemantic associations, at three levels: root

[35] A reviewer has constructively suggested that another way to approach phonosymbolism is the theory-driven and cross-linguistic approach, as found for example in the work by Johansson et al. (2020). It might be useful to consider how general theories about form-meaning associations may be reflected in Teko ideophones.

structure, vowels, and consonants. Maybe in the future, with a larger database and more coding, these could be better weighted.

8.4.1. Root structure

Recall that Teko ideophones are often monosyllabic, and generally start and end in a consonant, with the typical form $(CV)^{n}$.CVC. Under this basic template, the longer the word, the richer its semantics. Also, the more unexpected the phonemes (such as a median consonant not being /ɾ/ or identical with C1, or V2 being different from V1), the more complex the semantics. This raised complexity can concern the specification of aspect, participants, manner or ground for example (see the first four lines of Table 17). As for ideophones that depart from this canonical structure, a few observations are proposed (illustrated in the bottom part of the table). Long ideophones not made up of a sequence of CV syllables depict more complex events. Ideophones ending in a vowel generally refer to events without an intrinsic endpoint. And those with the CVV form almost all depict some motion in the air without the goal being part of their semantics.

root structure	ideophone	gloss
CVC	*kɨr*	grating
$CV_1ɾV_1C$	*kɨrig*	tying with the hand
$CV_1ɾV_2C$	*kɨrog*	swallowing voraciously
$C_1V_1C_2V_1$ $C_1V_1C_2V_1C$	*kɨsikɨsig*	moving and scraping
CVVCVCVCVC	*paɨripipig*	stumbling
CV	*po*	leaving
CVV	*paɨ*	body falling

Table 17. Root structure of ideophones and phonosemantics.

8.4.2. Vowels

A number of studies on ideophones have shown that vowel substitution within the same consonant template can express variation in the general meaning of this abstract template (a very nice case study is Tufvesson 2011). Most of these focus on the quality of the vowel, and concord with the so-called Frequency Code (Hinton et al. 1994: 10) according to which vowels with high second formants /i/ are associated with small size, sharpness, fast movements, while vowels with low second formants like /u/ associate with large size, softness, heavy and slow movements.

A preliminary look at Teko ideophones sharing the same consonant template confirms this phenomenon in that language. Following Ibarretxe-Antuñano (2017) on her analysis of Basque ideophones, one can say that "the place of articulation in vowels seems to indicate different degrees of the same action or event." The degrees seem to correspond to a front-back scale. This is illustrated by examples of the *tVg* set of ideophones, expressing a quick contact at a specific location. The figure that moves until impacting the ground at a specific point is bigger as the vowel goes back, at least from (69) to (72). As for the gradation between examples (72) to (74), it is less obvious what aspect of the action is impacted in degree: the figure, the ground, the noise, the duration, or something else. This remains to be explored.

(69) *pa* ***tig*** *o-niõ.*
IDEO.arrow_shooting **IDEO.stinging** 3-shoot_arrows
'Zzz, ping, he shoots (an arrow) and hits his target.' 04.020

(70) ***teg*** *teko-a=ne* *o-suʔu.*
IDEO.hitting emerillon-REF=CONTR 3-bite
'Sting, he (the snake) bit an Indian.' 23.073

(71) *hĩ-ãhã,* ***tag*** *iwər* *tareʔir-a=ne* *o-ʔu*
small-only **IDEO.striking** ? anjumara-REF=CONTR 3-eat
'Immediately, an anjumara (i.e. a big fish) caught it (a baby bird) and ate it.' 24.006

(72) ***Tɨg*** ***tɨg*** *o-wata* *o-ho.*
IDEO.walking **IDEO.walking** 3-walk 3-go
'He walked away'. (Cachine et al. 2020: 102)

(73) ***Tog*** ***tog*** *tata* *o-zoka.*
IDEO.cutting.with.axe **IDEO.cutting.with.axe** wood 3-break
'He splitted wood'. (Cachine et al. 2020: 103)

(74) *kor* *wɨrakara* *kar* *wɨwa* *moãhã* *o-eta,*
then God IDEO.cut stick like_this 3-cut

tug *awakʷər-punuʔã-r--ehe=ãhã* *o-bo-ɨg*
IDEO.hitting man-belly_button-REF-POSTP=only 3-CAUS-arrive

'Then God cuts a stick like this, and stuck it on the belly button of the man [to create the penis]' 23.092

Similar observations can be made with different templates. In a different semantic area, the contrast between *miŋ* 'closing eyes' and *moɲ/muŋ* 'darkness' can also be attributed to the quality of the vowel, the front one referring to a more delimited space. It has not yet been investigated whether the vowel quality has identical entailments in ideophones that do not appear to participate in a consonant template.

Additionally, special attention has been given to ideophones without monovocality, as they are formally marked. A preliminary study looked at ideophones with a back-front or front-back disharmony, with 8 and 10 items each. One could propose that these ideophones express some irregularity, or a fast change of state. However, the directionality of the change of vowel quality is not obviously significant. Both back-front and front-back combinations depict for example 'opening eyes' (*tuni*, *miwog*) and 'swallowing' (*sõʔẽsõʔẽ*, *petog*).

8.4.3. Consonants

Table 18 lists a number of consonant-meaning associations that seem to be frequent in ideophones above chance, given the frequency within the list of ideophones of both the phoneme in that position and the meaning. Needless to say, these are frequent rather than universal associations.

consonant distribution	semantics	example	gloss of example
initial /s/	liquid	sokoʤ*	walking in mud
initial /h/	mouth	hĩ	showing teeth
initial /p/	hand	pog	hitting
initial /p/	air	puɾ	farting
initial /w/	soft ground	woɾog*	feeling a gap in the ground
initial nasal	vision	niŋ	winking
initial /k/	cutting and separating	kiɾ	go off
initial voiceless plosive	contact by impact	pag	hitting
final velar /g/ or /ŋ/	ingestion	kiɾog	swallowing voraciously
final palatal /ʤ/ or /ɲ/	liquid or soft ground	soʤ*	entering water
final /g/	hand	kiɾig	tying with the hand
final /ŋ/	liquid or gaseous ground	miɾimimiŋ*	liquid dripping softly

Table 18. Consonants in ideophones and phonosemantics.

I will simply illustrate some of these associations with two contrastive pairs. Examples (75) and (76) both end in /ɲ/ and evoke a liquid participant and some gaseous ground, and the initial consonant substitution fits the association of initial nasals with ideophones within the semantic domain of vision. As for (77) and (78), they both

depict a body motion with some body parts going down to the ground, but in (78) ending in /ʤ/ the ground is liquid.

(75) *tuŋ*
'water pouring'

(76) *muŋ*
'invisible'

(77) *turug*
'stepping down'

(78) *turuʤ*
'fists hitting water' (a local manifestation of pleasure)

9. Discussion

This paper has presented a comprehensive description of the ideophones of Teko, through a systematic comparison with nouns and verbs, at various levels of analysis. The first goal was to evalute how marginal or central ideophones are within the Teko grammar, and the second goal was to determine whether and how they could be identified as forming a word class. Table 19 summarizes the findings per level of analysis (first column) with regard to whether and how ideophones are regular within the language (second column), or marginal (third column), and how they differ from the major lexical classes of nouns and verbs (fourth column).

	regular	marginal	different than nouns or verbs
frequency in the lexicon (1.3)	yes (5 to 8% of roots)		
frequency in speech (1.3)	yes (4% of words)		
phonemic inventory (2.2)	yes (29 phonemes in common)	yes (two sounds)	
phonotactics (2.3)	yes (same restrictions in general)	yes (final /h/ in two items)	different frequencies of distribution
nasality (2.4)	yes (mostly regular)	yes (a few irregularities)	

	regular	marginal	different than nouns or verbs
root structure (3.2)	yes (same syllable structures)	yes (two potential exceptions)	different distribution of structures
stress (4.2)		yes (some special stress patterns)	
prosody (4.3 to 4.5)		partially (salient mean vowel duration, pitch and intensity)	
expressive use of prosody (4.3 to 4.5)	yes (found with other word classes)		to be investigated
morphology (5.2)	yes (absence also found in other types of root)		no bound morphology
duplication (5.3)	yes (also on verbs)		different patterns than on verbs
word-class changing derivation (5.4)	yes		
syntax (6)	yes (integrated constructions)	yes (independent constructions)	different types of syntactic integration
sentence types (7.1)	yes		mostly in declarative sentences
discourse genre (7.2)	yes		
series (7.3)		yes (series of more than two items)	
semantics (8)	yes (comparable to that of verbs)	yes (depicts rather than refers)	
phonosemantics (8.4)		yes (some)	

Table 19. Integration of ideophones in the Teko language.

The detailed presentation of Teko ideophones developed in this paper and summarized in Table 19 shows that they are in fact rather well integrated in the lexicon, i.e. they are not outside of grammar, contrary to the outdated exotic view of ideophones (see also Newman 2001). Basically, only stress, prosody and their phonosemantics set them aside from the rest of the Teko lexicon. This paper also finds that the "exotism" of ideophones is limited. Particular facts in that direction listed in the third column are often restricted to a few items, i.e. a small minority of the ideophone class. Beside the stress patterns that definitively mark some of the ideophones as categorically different from the rest of the lexicon, the other major particularities of ideophones are not categorical: their prosody is discrete, and their phonosemantics is difficult to evaluate. The one major characteristic of ideophones that is fundamental to them is their depictive power. Depiction in ideophones has generally been approached through multimodal studies (Kita 1997; Reiter 2011; Dingemanse & Akita 2017). Unfortunately, the dataset used for this particular study does not allow us to study gestures, due to the absence of video recording. The marking of depiction in Teko ideophones has been investigated in detail from two of Akita (2021)'s perspectives: the foregrounding strategy (phonological distribution, root structure, word-level prosody) and the framing strategy (syntactic construction, pauses).

Finally, and most importantly for this special issue, this paper has also shown that Teko ideophones show regularities that call for them to be considered a distinct word category. Most of these features are statistical rather than categorical, except the absence of bound morphology, which seems to be their most straightforward formal defining criterium. My personal ordered list of tests used in methodologically identifying ideophones is as follows:

i) identification of the word as a non-verb through absence of morphology
ii) identification of the word as a non-noun on the basis of translation (either absence of translation in the text translation or "translation" with a full sentence, or an example (in elicitation), rather than by a simple word)
iii) identification of the word as an ideophone if the item in question is found in constructions where ideophones are found (with their special position)
iv) decision confirmed by expressive prosody when present (or if present in a different token of the item)
v) confirmation by a consultant familiar with the metalinguistic terminology, if possible.

Returning to the central idea that ideophones depict rather than refer, this fact results from the accumulation of small or large differences with respect to the rest of the lexicon. This makes the ideophones in Teko an obvious category of the language, immediately accessible to both native and non-native speakers.

Acknowledgments

I would first like to warmly thanks students and trainees for their collaboration on the databases: Mao-Line Fillon, Kenza van den Heuvel, Yana Akvilina and Viviane Ribes. I address special thanks to Jennifer Krzonowski for precious help with Praat scripts and statistics. I would also like to thank Elsa Oréal and Jean-Luc Chevillard for coordinating a research project of the CNRS Fédération de Typologie et Universaux called *Vers une typologie des parties du discours mineures: onomatopées, idéophones, interjections* (2002-2005), as well as Aimée Lahaussois and Yvonne Treis for putting together a workshop on *Ideophones and interjections* at the Annual meeting of the SLE in 2019, later joined by Julie Marsault as editors of the current special issue. This paper has also benefited from the remarks and suggestions of two anonymous reviewers, which I sincerely thank here. Last but not least, I send my deepest gratitude to the Teko speakers who have allowed me to investigate their language two decades ago, and especially to Jammes Panapuy with his instant grasping of the concept of ideophones. I also want to thank Alexis Michaud for having shared his recordings with me long ago.

Abbreviations

1INCL = 1st inclusive
ASSERT = assertive
CAUS = causative
CL = classifier
CONCES = concessive
CONT = continuative
CONTR = contrast
DEM = demonstrative
DESID = desiderative
DIM = diminutive
EXCL = exclamative
FOC = focus
FUT = future
IDEO = ideophone
IMP = imperative
INTER = interrogative
INTENS = intensive
MID = middle
NEG = negation
PL = plural
PL.S = plural of subject
POSTP = postposition
PRO = pronoun
PURP = purpose
RECP = reciprocal
RED = reduplication
REF = referential
REL = relativizer
RELN = relational
SG = singular
TOP_SW = topic-switch

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