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Studies in Lexical Iconicity

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Introduction

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Introduction

The present volume (*Studies in Lexical Iconicity*) is a collection of selected papers on lexical iconicity presented at two thematic workshops – *Onomatopoeia and Sound Symbolism*, held at the *56th Annual Meeting of the Societas Linguistica Europaea* (SLE-2023), 29 Aug. – 1 Sept. 2023 at National and Kapodistrian University of Athens (convenors: Livia Körtvélyessy, Pius W. Akumbu, and Maria Flaksman) and *All Shades of Iconicity*, at the *21st International Congress of Linguistics* (ICL-2024) held at Adam Mickiewicz University of Poznań, 8-14 September 2024 (convenors: Maria Flaksman, Alexandra Ćwiek, and Kathryn Barnes).

This volume covers a diverse array of topics on lexical iconicity – research on ideophones, onomatopoeia, and sound symbolism in (Mandarin) Chinese (Thomas Van Hoey), Emai (Ronald P. Schaefer & Francis. O. Egbokhare), Gizey (Guillaume Guitang & Pius W. Akumbu), Nivkh (Ekaterina Gruzdeva), and Mankanya (Aurore Montebran), on animal-oriented interjections (Juan Carlos Moreno Cabrera), on the diachrony of onomatopoeic words (Maria Flaksman & Alexander Kilpatrick), and on the interplay between onomatopoeia and phonaesthemic sound symbolism (Valeria Malysheva). Iconicity-related issues discussed in this collection of papers vary from semantics of ideophones and their classification to the effect of language change on form-meaning similarity in imitative vocabulary. Special focus of the SLE56 workshop was on the relation between onomatopoeia and sound symbolism in language, which is reflected in this volume.

1. Lexical iconicity

Ideophones, onomatopoeic words, and animal-addressed interjections are all instances of *lexical iconicity*. Lexical iconicity is studied within the framework of (language) iconicity studies. Iconicity studies, in its turn, is an emerging interdisciplinary branch of linguistic research which focuses on the relationship of form-meaning similarity in languages. As an interdisciplinary branch of research, iconicity studies / phonosemantics draws its key concepts, terminology, and methods from different well-established branches of linguistics: lexicology, phonetics and phonology, etymology, (lexical) semantics, cognitive linguistics, historical-comparative linguistics, language typology, and psycholinguistics.

1.1 Iconicity

The term "iconicity" was borrowed to linguistics from the general theory of signs (which pertains to semiotics). Charles Peirce (quot. after Peirce 1940), who introduced the concept of iconicity, classified all signs into (1) *indexes* (the sign and its object are connected existentially, relationship between them is a relationship of contiguity – e.g., smoke is indicative of fire), (2) *icons* (the sign and its object have a relationship of similarity – e.g., a portrait 'takes after',

resembles a person), and (3) *symbols* (there is a conventional, arbitrary connection between the sign and its object – e.g., a dove is a symbol of peace, it 'stands for' what it denotes).

Iconic signs, in turn, are classified into icons-*images* (a realistic portrait), icons-*diagrams* (a scheme), and icons-*metaphors* (comparison of a certain feature to a certain feature) (quot. after Peirce 1940). Imitative words (onomatopoeias, ideophones, etc.) are linguistic icons; diagrammatic iconicity appears in the form of reduplication, vowel or consonant lengthening (iconicity of quantity) and in repetition of the natural sequences of events by word-order. In this volume, diagrammatic iconicity in Nivkh is discussed by Gruzdeva (termed "gestalt iconicity" (for reduplication) and "relative iconicity" (for expressive vowel lengthening) in her article).

Human language is a system of signs that are symbolic (that is, arbitrary) in their nature (after Saussure 1966 [1916]). However, human language is not entirely arbitrary: iconicity (a non-arbitrary relationship of similarity) penetrates language at different levels and is present in both spoken (Körtvélyessy & Štekauer 2024; Hinton et al. 1994; Voeltz et al. 2001, Dingemanse 2012, Nuckolls 2001, Akita 2009, Koleva-Zlateva 2008, Mikone 2001) and signed languages (Klima & Bellugi 1979; Grote & Linz 2003; Russo 2004; Perniss et al. 2010; Cormiera et al. 2012; Nyst 2016; Napoli 2017; Ortega 2017; Kimmelman et al. 2018). Iconicity is registered on the phonological level ('sound symbolism', or association of certain phonemes with certain colours or shapes, like the *bouba-kiki* effect, see Köhler 1929; Ramachandran & Hubbard 2001), on the lexical level (coinage of onomatopoeic words and ideophones – this volume), and in morphology and syntax (Haiman 1980, 1985; Landsberg 1995; Fischer 2001).

1.2 Lexical iconicity studies

On the lexical (word) level, iconicity manifests itself in the form of imitative coinage. Iconic words (variously termed 'imitative', 'onomatopoeic', 'echoic', 'mimetic', 'expressive' words, and 'ideophones' in the literature) are instances of lexical iconicity, as they imitate (depict, take after) what they denote: cf. such words as English *meow*, *mew*, Estonian *näu*, Russian *мяу* [ˈmʲau̯], Vietnamese *meo*, all of which are acoustically similar to their denotatum – a cat's cry.

Lexical iconicity studies go back as far as antiquity (Plato's *Cratylus*); imitative (iconic) words were discussed in relation to the origin and evolution of language (Paul 1891). Nowadays, words with iconic relation between form and meaning are reported in languages from all over the globe – Swedish (Abelin 1999), French (Pharies 1979), Greek (Joseph 1987), English (Wescott 1980), Turkish (Marchand 1952), Finnish (Austerlitz 1994), Japanese (Hamano 1986), Korean (Davis & Lee 1996), Nez Perce (Aoki 1977), Huastec (Kaufman 1994), Pastaza Quechua (Nuckolls 1996), to name but a few. A significant contribution to the study of iconicity in language was made by the researchers of ideophones, e.g., Alpher (1994); Fortune (1962); Childs (1988); Maduka (1983); Newman (1968); Samarin (1971).

Experimental research on iconicity also gained momentum in the second half of the 20th century – see Werner (1957); Markel & Hamp (1960); Miron (1961), Osgood (1975); Ramachandran & Hubbard (2001). A growing number of psycholinguistic experiments also suggests that iconicity is one of the most fundamental human cognitive abilities (e.g., Shinohara & Kawahara 2010; Revill et al. 2014; Kazanina et al. 2006; Winter et al. 2017). Thus, psycholinguistic research explored the role of iconicity in second language acquisition (Kantartzis et al. 2011; Imai et al. 2008; Imai et al. 2014; Nation 2001; Macedonia & von Kriegstein 2012), and in multimodal language (Thompson & Do 2019; Shinohara & Kawahara 2010; Perniss & Vigliocco 2014; Dingemanse 2014; Bergen 2004).

Iconicity by L1 acquisition – in child language and child-directed speech – has also become a broad field of research on its own (see, e.g., Asano et al. 2015; Tzeng et al. 2017; Smith & Yu 2008; Perry et al. 2018; Ozturk et al. 2013).

The 21st century brought new directions of research to lexical iconicity studies: iconic (imitative) words were studied in pidgins and creole languages (Bartens 2000), as well as in speech directed to foreigners in contact situations (Childs 1994).

Another new branch of research on lexical iconicity is *iconicity in invented languages* (Rausch 2014; Davydova 2022).

Such wealth and variety of iconicity-related phenomena give reason to suggest that iconicity (at least, by word-coinage) is a universal feature of human language.

1.3 Ideophones

The term 'ideophone' was introduced to describe "[a] vivid representation of an idea in sound; [a] word, often onomatopoeic, which describes a predicate, qualificative or adverb in respect to manner, colour, sound, smell, action, state, or intensity" (Doke 1935: 118). It was applied to non-integrated lexical items which exhibit a number of non-systemic traits: expressive vowel or consonant lengthening, unusual tone or stress patterns, expressive ablaut or consonant alternation, violations of phonotactic rules, and unusual syllable structure (ideophones in some languages may have special syllable structure otherwise not encountered in the general vocabulary). Often, ideophones contain non-inventory sounds or infrequently used or borrowed phonemes. Also, ideophones are often not integrated morphologically or syntactically, or even have their own set of expressive affixes (after Voeltz et al. 2001). Such traits make ideophones 'marked' in comparison to other words of a language. Unusual phonology, morphology, and grammar of ideophones motivated their inclusion into a grammatical class of their own. However, in modern linguistics, ideophones are more often considered to be a lexical category. Thus, the most recent definition of an ideophone is "a member of an open lexical class of marked words that depict sensory imagery" (Dingemanse 2019: 16).

Ideophones are classified semantically. Thus, Dingemanse (2012: 663) suggested the following hierarchy of ideophones in languages according to their meaning (the most frequently encountered ideophones are on the left, the least frequently encountered – on the right): SOUND < MOVEMENT < VISUAL PATTERNS < OTHER SENSORY PERCEPTIONS < INNER FEELINGS AND COGNITIVE STATES. Ideophones depicting 'sound' are, as Doke (1935) suggested, onomatopoeic.

Ideophones are very expressive because of their markedness, and, thus, stylistically restricted; therefore, most often, they are encountered in oral, informal speech (Samarin 2001). Kunene (2001: 184) claims that the ideophone is "the closest linguistic substitute for a non-verbal, physical act". Thus, ideophones are "performed" (Kilian-Hatz 2001: 156) in the course of interaction, and this performance is often accompanied with gesture.

In this volume, onomatopoeic and non-onomatopoeic ideophones are discussed by Aurore Montebran (*Sound symbolism in Mankanya*), by Ronald Schaefer and by Francis Egbokhare (*Asymmetry among vocal sounds for non-vocal sound experiences: An Edoid case*) as well as by Thomas Van Hoey (*Dynamic extensions of iconic form-meaning mappings in visual media, viewed through a prismatic lens*).

1.4 Onomatopoeic words

Onomatopoeia has multiple definitions in the literature. It can be viewed as a means of word-formation (Koziol 1937; McKnight 1969; Bauer et al. 2013; Ringe 2021), as a figure of speech (McArthur's 1992: 729), or as a lexical class (Benczes 2019: 102).

Onomatopoeic words (if viewed as lexical items) also have multiple definitions. Thus, the *Oxford English Dictionary* defines onomatopoeia as "formation of a word from a sound associated with the thing or action being named" [OED, s.v. *onomatopoeia*], and an onomatopoeic word, consequently – as "a word formed by onomatopoeia" (ibid.). Some authors limit onomatopoeic words to onomatopoeic ideophones (see above). For example, Körtvélyessy and Štekauer (2024: 3) define onomatopoeias as "simple, underived, uninflected, and conventionalized words based on the direct imitation of sounds of the extra-linguistic reality". To define the 'prosaic' onomatopoeic words (syntactically and morphologically integrated onomatopoeic verbs, nouns, etc.), Körtvélyessy and Štekauer (2024) introduce the concept of "secondary onomatopoeia". Others (e.g., Flaksman 2024) regard all words coined by direct acoustic means of imitation to be onomatopoeic, regardless of their grammatical class (onomatopoeic words are, thus, defined as "words with iconic correlation between form and meaning which depict natural sounds by means of acoustic imitation" (ibid.: 34)).

Classifications of onomatopoeic words in the literature also vary. Apart from being included into the lexical class of 'ideophones' (see above), onomatopoeic words (if taken as a separate group) can be classified (1) semantically, that is, according to their meaning – animal sounds, human sounds, etc. (Körtvélyessy & Štekauer 2024), (2) phono-semantically, that is, according to the type of iconic form-meaning correlation – words imitating abrupt sounds with plosives, words imitating with high-pitched vowels, etc. (Voronin 2006 [1982]), or (3) according to types of interpretation – phonetic, syllabic, or phrasal (the latter refers to linguistic expressions that sound similar to natural sounds – e.g., Costa Rican Spanish *dios-te-dé* ('God-you-give') (bird *Ramphastos swainsonii*) (Moreno-Cabrera 2016: 77).

Juan Carlos Moreno-Cabrera continues the discussion on the 'peripheral' types of onomatopoeia in this volume (*Animal-Oriented interjections in the languages of the Iberian Peninsula*). Onomatopoeia is also addressed by Guillaume Guitang and Pius W. Akumbu (*Gizey onomatopoeias*) and by Maria Flaksman and Alexander Kilpatrick (*Against the tide: How language-specificity of imitative words increases with time (as evidenced by Surprisal*). The latter explore it from a diachronic perspective and by statistical methods.

1.5 Mimetic words (*articulatory iconicity*)

Some authors (Hinton et al. 1994; Anderson 1998; Voronin 2006 [1982]; Flaksman 2024) differentiate words imitating various (in)voluntary physiological processes (sneezing, coughing, kissing, etc.) from onomatopoeic words. Such words are variously termed 'sound-symbolic' (Voronin 2006 [1982]: 70), 'kinesthetic' (Anderson 1998: 167), or 'mimetic' (Flaksman 2024: 50). Hinton et al. (1994: 2-6) refer to this type of imitation as "corporeal sound symbolism". In Flaksman (2024: 53) words-instances of articulatory iconicity are defined as "words with iconic correlation between form and meaning which depict (in)voluntary speech apparatus movements by means of articulatory imitation". Thus, the main criterion for differentiating words like *heck*, *mwah*, *achoo* from onomatopoeic words is the means of imitation (articulatory as opposed to acoustic). Gruzdeva (this volume) explores

articulatory iconicity in Nivkh which goes beyond imitation of speech apparatus movements – in Nivkh, there are documented articulatory imitations of form and shape of external objects.

1.6 Other iconic words (*phonaesthemic words and iconic interjections*)

Apart from ideophones and onomatopoeias, there are other categories of words considered iconic in the literature, some of which overlap depending on the linguistic tradition. For instance, some interjections are considered iconic (e.g., animal-oriented interjections – see Moreno-Cabrera, this volume). Note, however, that one should distinguish primary interjections (*Gee! Oho! Ooops!*) from the secondary ones (*Goddammit*! *Hell*! *Heavens*! *Bother! Christ*! (Ameka 1992: 105). Also note that non-integrated onomatopoeic ideophone-like words (like *bow-wow*! *ding-dong*!) are consistently classified as 'interjections' (grammatical category) in lexicographic sources (such as the *Oxford English Dictionary*).
Other categories of words sometimes associated with iconicity are nursery words (*mama, papa*) (Marchand 1960: 313), rhyming formations like *helter-skelter*, *hurry-scurry* (Benczes 2019: 135), and phonaesthemic words (Firth 1935, Marchand 1960). The latter are the most controversial group: phonaesthemes are clusters of phonemes systematically paired with certain meanings (e.g., *sw-* in ***sw****ing*, ***sw****ay*, ***sw****agger* is associated with movement). Malysheva (this volume) explores to what extent words of phonaesthemic groups can be considered iconic and to what extent – systematic (that is, formed by analogy).

Thus, imitative lexicons of different languages are very diverse. So are the approaches to their study and description. This volume gives an insight into lexical iconicity in Basque, Chinese, Emai, English, Gizey, Mankanya, Nivkh, and in Romance languages, and, in so doing, provides a wealth of iconicity-related discussions.

2. Contributions to this volume

This volume unites scholars from the different branches of research on linguistic iconicity who cover a wide array of iconicity-related topics – from semantics of ideophones (Van Hoey) to phonaesthemic sound symbolism (Malysheva).

Aurore Montebran studies iconic words in Mankanya, a minority language spoken in Guinea Bissau, Senegal, and Gambia. Three classes of Mankanya iconic words are analyzed: onomatopoeic words, ideophones, and depictive verbs. Montebran explores their morphological, phonological, semantic, and syntactical features. A special emphasis is put on iconicity of quantity – vowel lengthening and reduplication in Mankanya.

Ekaterina Gruzdeva explores iconicity in Nivkh, an endangered language of the Amuric language family, spoken in the Lower Amur basin and on the north-western coast of Sakhalin Island in Russia. Gruzdeva presents the results of the analysis of her fieldwork data on Nivkh imitative words. The author differentiates sound imitative iconicity (onomatopoeia) from articulatory iconicity. The article, thus, summarizes prominent morphological (reduplication) and phonological features (expressive vowel lengthening, iconic vowel raising, and consonant voicing) of Nivkh imitative vocabulary.

Guillaume Guitang and *Pius W. Akumbu* study onomatopoeic words in Gizey (which belongs to the Masa branch of Chadic (Afroasiatic) languages). Onomatopoeia in Gizey is encountered in nouns, interjections, and adverbs. The authors explore phonology (including syllable structure and tonal schemes), (derivational and inflectional) morphology, and syntactic

behaviour of Gizey onomatopoeic words. They reveal that many onomatopoeias in this language tend to have a similar root structure – CiC, and suggest that this dominant structural model is merely a morphological niche from which new onomatopoeic forms are created by means of analogy.

Juan Carlos Moreno Cabrera studies animal-oriented interjections in the languages of the Iberian Peninsula, in particular, those which contain trilled sounds. He argues that some of these interjections are based on onomatopoeias. Such interjections (English *tuck-tuck-tuck* – directed to chickens or Spanish *corr*, *curr* – directed to pigs) form a part of the lexical group 'animal commands'. However, unlike other animal commands, they are not formed from other lexical items (like *sit*! *dog*!, etc.) but coined anew. Moreno Cabrera compares animal-directed interjections in Spanish, Portuguese, Catalan, Basque, Galician, and other languages of the geographic area. Thus, he studies interjections directed to pigs, chickens, dogs, cats, horses, and sheep while distinguishing the interjections used to call these animals to oneself and those used to scare them away. Moreno Cabrera establishes recurrent iconic form-meaning correspondences in these words and explores word-formation from animal-directed interjections and their de-iconization.

Maria Flaksman and *Alexander Kilpatrick* study the effect of regular sound changes on English onomatopoeic and mimetic words. They compare several databases and corpora of the English language to reveal that regular sound changes have led to de-iconization (lessening of original form-meaning similarity) in English imitative words. In particular, they explore the potential of phonemic bigram Surprisal as a markedness feature of iconic words. The results of the study have confirmed that the de-iconization process makes words less phonologically marked, and that an accompanying increase in bigram transitional probability makes English imitative words more similar to non-imitative words of the English language, that is, more language-specific.

Ronald Schaefer and *Francis Egbokhare* study iconic words (ideophones and onomatopoeia) in Emai, an Edoid language of Nigeria. The authors provide a linguistic description of Emai sound-ideophones, explore their syntactic behaviour, morphological variation, and exceptional phonology (including the tonal properties of Emai ideophones). The study is based primarily on the authors' Emai fieldwork data comprised of over 30 hours of oral narrative texts from village storytellers.

Thomas Van Hoey studies form-meaning mappings in ideophones and onomatopoeias and questions how stable these mappings are. In particular, Van Hoey explores semantic shifts which imitative words undergo in advertisements and social media. The author applies a multimodal prismatic model of semantic change to Chinese ideophones from the collected database. The study of (Mandarin) Chinese ideophones on social media ("in the wild") reveals considerable semantic shifts already at the synchronic level. The main conclusion to which Van Hoey arrives is that iconic form-meaning mappings in iconic words are not necessarily stable (as has been suggested before) – they can easily be extended semantically, given the right context.

Valeria Malysheva explores to what extent English phonaesthemic words can be considered iconic (and, in particular, onomatopoeic). She conducts an etymological analysis of English words from *br-* and *cr-* phonaesthemic groups and analyses the pathways of their semantic development. Malysheva argues that the studied phonaesthemic groups have a core and a periphery, and that the core of these phonaesthemic groups is comprised of words onomatopoeic by origin. The author further explores which phonetic features of the sounds comprising these phonaesthemes could have affected the semantic development of the studied

lexical groups in general. The creation of a phonaesthemic group, thus, is viewed in this article as a (diachronically stretched) process of semantic organization of the lexicon based on synaesthesia (cross-modal shifting).

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Sound symbolism in Mankanya

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Abstract
This paper discusses the use of sound symbolism in Mankanya (Bak, Atlantic, Niger-Congo), a minority language originally spoken in Guinea Bissau, but now spread to Senegal and Gambia. It focusses on three different word classes (onomatopoeias, ideophones and depictive verbs), looking at their phonological, morphological, syntactic and semantic features. It also considers the ways of expressing or encoding iconicity and emphasis, as well as the use of typical strategies of sound symbolism such as vowel lengthening and reduplication.

Keywords*: sound symbolism, iconicity, ideophones, depictive verbs, Mankanya*

Introduction

This chapter deals with sound symbolism in Mankanya (Niger-Congo, Atlantic, Bak, Manjaku subgroup; *knf-mank1251*), a minority language from Guinea Bissau, also spoken in Senegal and Gambia. Following the definition of sound symbolism (iconicity) given by Nuckolls (1999: 228), – a phenomenon "when a sound unit such as a phoneme, syllable, feature, or tone is said to go beyond its linguistic function as a contrastive, nonmeaning-bearing unit, to directly express some kind of meaning" – one can identify altogether three sound symbolic word categories (onomatopoeias, ideophones, and depictive verbs) in Mankanya. Words from each of these three categories exhibit sound symbolic traits which explain their unique traits in phonology, morphology, and syntactical behavior. Firstly, there are onomatopoeias (imitations of natural sounds) which have a specific phonological constitution. Secondly, there are ideophones which constitute a closed word category (containing 8 items) and occur in a specific syntactic and semantic context. Morphological and phonological properties of Mankanya ideophones make them 'marked', and, therefore, expressive. Lastly, there are depictive verbs fully integrated in the lexicon which behave like all other verbs in the Mankanya language; however, they exhibit some morphological features (including reduplication) which signal their iconicity.

The article is based on the data from published works on Mankanya (Trifkovič 1969; Gaved 2020) and from the data from a dedicated questionnaire obtained during our fieldwork research (Montébran 2022: fieldnotes). The analysis focusses on the main variety of the Mankanya language called Hula. Hula is an agglutinative non-tonal language with a strict SVO word order. Noticeably, subject agreement is always marked on the verb by a prefix. Atlantic languages are known for their rich and complex verbal morphology. It shall be noted that verbal reduplication is used in the conjugation to encode verb focus. Regarding the Hula syllable structure, the most common pattern is CVC, followed by CVVC (Trifkovič 1969: 2).

The aim of this study is to provide a linguistic description of the system of sound symbolism in Mankanya. The research has two main objectives: (1) to determine the characteristic features of sound symbolism in the studied language (How does it occur? Which role does it play in the language? Are there any differences in how iconicity manifests itself in the three considered word categories and in other word categories?) and (2) to study the sound-meaning correspondences in iconic words in Hula (also, to identify phonaesthemes (if there are

such in the language) and to study whether they occur consistently in the three identified word categories).

Thus, this article provides a synchronic description of sound symbolism in the Hula variety of Mankanya, with examples from the closely related languages provided for comparative purposes.

This paper is divided into three main parts; the first part explores Mankanya onomatopoeias, the second part – ideophones, and at the third one – depictive verbs.

1. Onomatopoeic words in Mankanya

Onomatopoeia is defined in this article as "an imitation of natural sounds based on a specific phonological construction". In Mankanya, it occurs mostly in one-word utterances, clefted structures, or in quoted structures (mostly in reported speech).

There are very few data on the Mankanyan onomatopoeias in the literature, and even a dedicated questionnaire allowed us to collect only a handful. Two main reasons for sparsity of onomatopoeic words in Mankanya have been identified: (1) a lack of transmission and (2) the intensive use of words from local dominant languages (in particular, from Wolof, or from one of the Joòla languages). The latter were identified by the speakers as borrowings used instead of the Mankanyan onomatopoeias.

Following Körtvélyessy (2024), the sound events imitated by onomatopoeias can be categorized into two main groups according to their semantics. The first one unites onomatopoeic words imitating natural sounds, i.e. sounds produced by animals, humans, and elements of nature (for example, water sounds which include rain sounds, air sounds which includes the sound of the wind, etc.). The second group unites artificial sounds, i.e. sounds produced by or with inanimate crafted objects –for examples, sounds of signalling equipment (typically bells or gongs), sound of knocking on the door, sounds of destruction of objects (sounds broken glass, explosions, etc.) or sounds of electronic devices (typically phones). Table 1 shows the distribution of the Mankanya onomatopoeic words according to their semantics.

Table 1: Semantic classification of Mankanyan onomatopoeias

Natural sounds		**Artifact sounds**	
Sound source	**Number**	**Sound source**	**Number**
Elements of nature	1	Equipment	1
Human	3		
Animals	13		

Considering their morphology and syllable structure, Mankanyan onomatopoeias are mostly monosyllabic and invariable. Their single syllable generally exhibits the CVC / CVVC pattern; that is, typical Mankanyan onomatopoeias (as far as our data allow to judge) are words consisting of one closed syllable with either a short or a long vowel. As it will become evident in the examples discussed further in this section, reduplication and lengthening also play an important role by imitation – they either make the word more iconic or have a function of meaning intensification.

Thus, I distinguish the following semantic subgroups among Mankanya onomatopoeias:

(1) *Artifact sounds: knocking on the door*
Knocking on the door in Mankanya is encoded by the onomatopoeia *koŋ koŋ (koŋ)*. The word composed by reduplicating the syllable *koŋ*, which usually occurs twice ("frozen reduplication"). However, it also tends to occur three times (I suggest the influence of the French *toc-toc-toc* with the same meaning). Reduplication in the onomatopoeic word *koŋ koŋ* iconically renders sound repetition. Considering the phonemes comprising *koŋ koŋ*, it is worth noting the velar nasal [ŋ] at the end that renders the typical resonant sound of the metal door (made out of corrugated plates). The choice of the back vowel [o] might render the 'deepness' (low-pitch) of the imitated sound. This onomatopoeia is not used only by the Mankanyan people, but it is also frequent in other languages of Senegal. However, despite the wide distribution of *koŋ koŋ,* the speakers of Mankanya do not consider it to be a loanword.

(2) *Elements of nature: rain sounds*
The onomatopoeia encoding rain is *frrrrrrr*, which is obviously an exception to the CVC pattern discussed above. The use of the fricative and lengthened vibrant trill allows to render a prolonged sound event. The absence of a vowel is likely to be a way of encoding a lower volume of this sound, which is, however, not silent. The voiced vibrant [r] expresses the beating of the rain and its voiced quality emphasizes the strength of the rain.

(3) *Human sounds*
Three of the collected onomatopoeias have been categorized as human sounds. They are presented in Table 2.

Table 2: Onomatopoeias encoding human sounds

Onomatopoeia	**Meaning**	**Examples**
yoow	happiness	*Yoow ibani*! 'You arrived'; *yoow ibii*! 'You came' (welcoming somebody)
wooy	pain	*Nni wooy*! (*nni* 'my mother')
hiis!	sneeze	*Dte hiis*! 'I heard a sneezing sound'

These Mankanya onomatopoeias do not have any stop consonants, but contain fricatives, glides, and long vowels (all of which can be lengthened for the purpose of intensification). As for the meaning of these onomatopoeic words, two of them convey emotions, cf. the contrastive pair HAPPINESS and PAIN. It is noteworthy that this semantic opposition can be one of the reasons for keeping these two words in the language whereas other onomatopoeias have probably disappeared. In addition, there is a taboo restriction (modesty) on sounds of the human body, which might have created a bias in the data collection.

(4) *Animal sounds*
The Mankanya onomatopoeias conveying animal sounds are presented in Table 3. In the questionnaire we used in our field work, consultants were asked two questions regarding animal sounds – (1) they were asked to provide an animal cry itself and (2) to provide the corresponding verb conveying it (like the English verbs *bark* for a dog or *mew* for a cat).

Table 3 summarizes the obtained data. The data testify that very few denotations of animal cries have words for both categories – the majority only have a non-integrated onomatopoeic word for the animal sound while others have only a verb.

Table 3: Onomatopoeias encoding the sounds of animals

	Animal names (CLF2 *u-*)	**Depictions of their calls**	**Associated verbs (*p-* INF marker)**
BIRDS	*u-guk* 'rooster'	*koook o koook o koook o*	*p-haan*
	u-guk 'chicken'	*kok o kok*	*p-kaak*
	u-jëlu 'small bird'	*kik kik kik*	
	u-paata 'duck'	*kak kak kak*	
	u-ntomali 'crow'	*hooh! hooh!*	
	u-buş 'dog'	*wuuw wuuw*	*p-hañla*
	u-buuru 'donkey'	*uhuuu! uhuuu!*	
	u-wit 'cow'	*wuuh wuuh*	
	u-mpëlënt 'horse'	*hiiin hiiin*	
	u-nkuma 'pig'	*hëëmm hëëmm*	
	u-nkaneel 'sheep'	*mbee mbee*	
	u-pi 'goat'	*mbee mbee*	
	u-daalu 'cat'	*ñeew ñeew*	
	u-pula 'snake'		*p-funtëb**
	u-ñiiŋ 'hyena'		*p-wuuh*
	u-liihu 'lion'		*p-liih*

* 'whistle' (also in reference to humans)

At first sight, it may appear that the (non-integrated) onomatopoeias are monosyllabic or disyllabic with a typical structure CVC, CVVC, or VCVVV; however, the analysis reveals that there are cases of 'frozen' (historical) reduplication in the data. Reduplication is, undoubtedly, a marker of and a strong argument for iconicity.

Considering the typical patterns of form-meaning matching in these Mankanya words, one can observe the following: plosives are, overall, rare in animal cries (and the only one that occurs is voiceless). The most frequent consonants in these words are nasal or prenasalised consonants, sonorants, and fricatives. One also observes iconic vowel lengthening and use of long vowels to express prolonged sound or for an emphasis. As for recurring sound-meaning correspondences in these words, it appears that: (1) [k] is used for bird sounds (the only voiceless plosive in the data), (2) the [i]-[a] opposition is used for the 'small' vs. 'big' distinction (to be confirmed with more data)., and (3) [o] renders deep (low-pitched) sounds and [i] – the high-pitched ones.

With the exception of *p-kaak* verb for chicken sounds, there are no correspondences between the onomatopoeias depicting animal and bird cries and call and the verb naming the actions of producing these sounds. And with the exception of *p-liih* for the verb depicting a

lion sound, there are no correspondences between the verbs and the names of the animals/birds. Thus, it can be assumed that the changes in the lifestyle (urbanization) in the last few decades have influenced the vocabularies of the Mankanya speakers – animal sounds have gradually gone out of use.

2. Ideophones in Mankanya

Ideophones are defined in the literature as "marked words depictive of sensory imagery" (Dingemanse 2012: 655). This definition, however, has different applications in different languages. It includes several linguistic criteria the relevance of which differs from language to language. Thus, this section aims at answering the following questions: (1) Which are the relevant criteria for the definition of ideophones in Mankanya? and (2) What are the characteristic traits of ideophones in Mankanya? These questions lead us to the ensuing discussion on the homogeneity of ideophones, and on whether Mankanya ideophones are a word class on their own (or belong to another word class, i.e., nouns, verbs, adverbs, etc.).

2.1 Mankanyan ideophones: an overview

There are two main linguistic descriptions of the Mankanya language (Trifkovič 1969 and Gaved 2020). In her description, Trifkovič (1969) does not mention ideophones, neither in the study, nor in the lexicon attached to her work. Gaved (2020), on the other hand, dedicated a part of his work to ideophones. Thus, Gaved (2020: 114)[1] considers ideophones as a *closed* class of modifiers occurring with qualifiers following strict collocation rules, i.e. no new word can be added to the class, which is not typical for ideophones. The researcher (ibid.) also outlines some morpho-phonological features of ideophones: they are invariable sound symbolic words, monosyllabic (with an CVC-pattern), and possess no marginal or non-phonemic sounds. The intensifier always occurs at the end of the clause, and it is frequently followed by a pause. The expressivity of ideophones is marked by the volume of the voice (which is also reinforced by the pause following the ideophone), more than by lengthening of a short vowel.

During our data collection we noticed that younger speakers do not use or even know the words from Gaved (2020). Instead, they employ other words, i.e., the adverb *maakan* 'very', with a specific emphasis on the long vowel to reinforce the intensification. The intonation pattern on the adverb *maakan* 'very', which is stressed on the long vowel, thus, differs considerably from the Gaved (2020: 114) data. Mankanya is an endangered language, considered vulnerable, meaning that the transmission of the language still occurs inside the family, but that the language is not spoken in all domains and is mainly restricted to home use (Moseley 2010). Therefore, our hypothesis is that ideophones are becoming obsolete due to lack of transmission.

[1] Gaved (2020: 114): "There is a closed class of words that modify adjectives or verbs that are monosyllabic of the form CVC and are invariable. They have very strict collocation rules and normally each one can only be used with one or two different words. For example, *kafaatal feh* 'brilliant white' where *feh* 'brilliant' is a modifier that can only be used with *faatal* 'white'. These words are sound symbolic, and I will refer to them as ideophones. Different from what is found in many other languages, Mankanya ideophones do not contain marginal or non-phonemic sounds".

Tables 4 and 5 provide a list of Mankanyan ideophones (altogether 10 words)[2]. Among them, 8 have already been identified as ideophones by Gaved (2020: 115). Table 4 lists the ideophones used with a stative qualifier.

These qualifiers may be adjectives, defined as a noun modifier that agrees with the head noun and which can have a predicational use (Gaved 2020: 89). All the stems of these qualifiers are also used for forming stative verbs (the infinitive marker is the prefix *p-*). Since ideophones typically occur with verbs, the verbal citation form will be used to refer to the qualifier. The first eight ideophones of Table 4 are already listed in Gaved (2020: 115), the last one was recorded during my fieldwork (Montébran 2022: fieldnotes).

Table 4: Mankanyan ideophones from (Montébran 2022: fieldnotes)

Ideophone	Collocated with	Predicative meaning	Examples
baŋ	*p-kay*	'be very dry'	*D-ko da-kay baŋ* CLF9SG-place CLF9SG-be_dry ID The place is very dry.
	p-yiik	'be very hot'	*U-leef u-yiik baŋ* CLF2SG-body CLF2SG-be_hot ID The body is very hot.
feh	*p-faat*	'be very white'	*Ka-miṣa ka-faat feh* CLF3SG-shirt CLF3SG-be_white ID The shirt is very white.
jud	*p-jeenk*	'be very red/ripe'	*P-maŋa pa-jeenk jud* CLF6SG-mango CLF6SG-be_red/ripe ID The mango is very red/ripe.
juk	*p-joobëţ*	'be very cold'	*Meel man-joobëţ juk* water CLF8SG-be_cold ID The water is very cold.
	p-yomp	'be very quiet'	*Na-poţ a-yomp juk* CLF1SG-child CLF1SG-be_quiet ID The child is very quiet. *Ka-toh ka-yompandër juk* CLF3SG-house CLF3SG-be_quiet ID The house is very quiet.
lot	*p-ñow*	'be very wet'	*Mboṣ man-ñow lot* sand CLF8SG-be_wet ID The sand is very wet.
pëţ	*p-jën*	'be very black'	*U-pi u-jën pëţ* CLF2SG-goat CLF2SG-be_black ID The goat is very black.
piṣ	*p-jint*	'be very clean'	*I-hoţ i-jinţ piṣ* CLF3PL-foot CLF3PL-be_clean ID

[2] There are very few ideophones in the Mankanya language, however the same situation also takes place in the two closest related languages – Manjaku (*mfv-mand1419*) and Papel (*pbo-pape1239*). In Manjaku, Buis (1990: 24) and Mendès & Malherbe (2007: 18) consider ideophones as proper adverbs with strict collocation rules. Five ideophones are listed, all used with stative verbs and with an intensive meaning. In Papel, there are 10 ideophones, which are used as intensifiers of stative verbs (Ndao 2011: 119).

			The feet are very clean.
rad	*p-tam*	'be very hard'	*P-baloŋ pa-tam rad* CLF6SG-ball CLF6SG-be_hard ID The ball is very hard.
şuuy	*p-yiik*	'be very hot'	*U-leef u-yiik şuuy* CLF2SG-body CLF2SG-be_hot ID The body is very hot.

Among the eight ideophones listed by Gaved (2020: 115), two (*baŋ* and *juk*) co-occur with two different verbs. Table 5 shows the ideophone *kaŋ* co-occurring with a noun *p-nak* 'day, daytime'.

Table 5: *kaŋ* with a noun p-nak 'day, daytime', from (Montébran 2022: fieldnotes)

Ideophone	Collocated with	Predicative meaning	Example
kaŋ	*p-nak*	'(full) daylight'	*A-de na p-nak kaŋ* 3SG-eat with CLF4SG-daytime ID He is eating in broad day light.

In the subsections that follow, I discuss the semantics of ideophones (2.2), examine their collocation (2.3), phonological features (2.4), syntactic and morphological features (2.5), and elaborate on whether ideophones form a separate word class in Mankanya (2.6).

2.2 Semantics of Mankanyan ideophones

There are two aspects which shall be considered while defining the semantics of the Mankanya ideophones: (1) the meaning of the ideophone itself and (2) the meaning of the word modified by the ideophone. Semantically, the ideophones listed in Tables 4 and 5 are homogenous, occurring as intensifiers, which typically emphasize the notion encoded by the word that they modify. Thus, ideophones, as emphatic markers, are typically expressive words, which will be confirmed below by their use in the comparisons. Synchronically, ideophones do not have any meaning in isolation. They are only understood by their function as intensifier and, therefore, only in restricted collocation.

Apart from ideophones, the meaning of 'very' is conveyed by the adverb *maakan* in Mankanya. Concerning their adverbial properties, Gaved (2020: 111) claims that "adverbs modify verbs, and some can also modify nouns or a limited number of adjectives". As mentioned above (Section 2.1), younger speakers or Mankanya people who did not grow up in a core Mankanya speaking area frequently use *maakan* instead of one of the ideophones listed above.

Considering the notions intensified by the Mankanyan ideophones, some of them are pairs of notions (1a), but there are also isolated notions (1b); additionally, there are colour terms (1c) intensified by the ideophones from our data (Montébran 2022: fieldnotes)

(1) a. *p-yiik* ‘be hot’ / *p-joob* ‘be cold’
p-kay ‘be dry’ / *p-ñow* ‘be wet’

b. *p-yomp* ‘be quiet’
p-tam ‘be hard’
p-jinţ ‘be clean’

c. *p-jën* ‘be black’
p-faat ‘be white’
p-jeenk ‘be red/ripe’

All Mankanyan words that occur with ideophones refer to states and qualities, with the exception of *p-nak kaŋ*. Thus, Mankanyan ideophones can be classified as “modifying qualifiers”.

Regarding their use with colour terms, Segerer and Vanhove (2021: 24) note that “three ideophones intensifying these three colours [white, black and red] are recurrent in one region in West Africa, in four branches of Niger-Congo (Atlantic-North, Mande, Dogon and Adamawa), two branches of Afroasiatic (Chadic and Semitic), and one Songhay variety (Varia).” Moreover, they claim that “the three ‘basic’ colours, black, white and red, concentrate nearly all the ideophones. This might be due to the fact that these colour terms are typically verbs, and that ideophones typically modify verbs. Interestingly, each one of the 106 languages which have colour ideophones has, on average, 3 different ones for each of the three black, white, and red colors” (Segerer & Vanhove 2019: 315-316). Indeed, these three colours correspond to the stative verbs: *p-faat* ‘be white’, *p-jën* ‘be black’, *p-jeenk* ‘be red’, whereas other colours are nouns, that may be borrowed: *u-niilu* ‘blue’, *u-lel* ‘yellow’, *u-fëlu* ‘grey’ (with the nominal class prefix *u-*).

Lastly, Mankanya colexifies[3] the colour ‘red’ and the notion ‘be ripe’[4]. Both meanings are equally intensified by the ideophone *jud*. In example (2), the ideophone is typed in bold, and the square frame specifies its scope.

(2)

p-	*maŋa*	*pa-*	*jeenk*	***jud***
CLF6SG-	mango	CLF6SG-	be red/ripe	**ID**

‘The mango is very red/ripe.’

2.3 Collocation of Mankanyan ideophones

Ideophones only occur with one or two qualifiers, so the collocation rules are very strict. Two main points will be addressed here. The first concerns the part of speech that can be modified by an ideophone in the Mankanya language, the second concerns the cases of non-one-to-one pairing.

The first collocation rule is that Mankanya ideophones typically intensify qualifiers in a predicational use. Surprisingly, the inventory reveals a collocation with a noun *p-nak*

[3] Following François (2022: 95), “a language colexifies two distinct senses if it can express them using the same lexical form”.
[4] Mankanya also colexifies “green” and “unripe” with *umpank* (Gaved 2004: 29). This colour term cannot occur with an ideophone.

‘day/daytime’, as in example (3) where *p-* is a marker of nominal class (Montébran 2022: fieldnotes).

(3)	*a-*	*de*	*na*	*p-*	*nak*	***kaŋ***
	3SG-	eat	with	CLF4SG-	daytime	**ID**

‘He is eating in broad day light.’

Semantically, our language consultants interpret it as an intensifier[5]. If *kaŋ* is not analysed as an ideophone, then *p-nak-kaŋ* could be a compound. But “compound nouns are a combination of a noun and a noun” (Gaved 2020: 45), not a noun with a bound morpheme. Moreover, *kaŋ* never appears outside of this collocation. In addition, Nicolas Quint (p.c.) also mentions other occurrences of similar cases in different languages:

In Koalib (Kordofanian), the scope of the intensifying ideophone emphasizes the exactness of the middle, as in example (4).

(4)	*né*	*àaŋwòn*	*èrlé*	*kɛ́lkɛ́ny-ná*	***ʈíʈʈìr [ríʈʈìr]***
	and	sun	stand.IPF.CTF	middle	**ID**

‘and the sun was at its zenith’

In Casamançais (Portuguese-based creole from Casamance, Southern part of Senegal), the expression *didiya lɐm* ‘in (full) daylight’ shows the adverb *didiya* referring to the middle of the day (from 12 p.m to 2 p.m), which can occur with the ideophone *lɐm* emphasizing the exact middle of the period of time (Quint, p.c.).

In Mankanya, there is no exact one-to-one pairing between the ideophones and the modified qualifiers. Noticeably, these cases of multiple pairing both concern the same pair of notions: *hot-cold*.

Also, two ideophones can be used with two different qualifiers: *baŋ* with *p-yiik* ‘be hot’ and *p-kay* ‘be dry’; *juk* with *p-joobëʈ* ‘be cold’ and *p-yomp* ‘be quiet’. In this case, there are more qualifiers than ideophones. The use of the same intensifier with two different verbs brings the meaning that they convey closer; i.e., ‘hot and dry’ with *baŋ*, ‘cold and quiet’ with *juk*.

The ideophone, thus, is a concrete link between the two notions. However, the question is – Does it reflect a semantic proximity? This raises yet another question – Is it habitual to link these meanings in other languages as well?

Using the homonymy and polysemy tool of the *Reflex* database[6], we searched for colexifications of these notions in other African languages.

The results of our search have revealed the following:

(1) *‘Hot’ and ‘dry’*

‘Hot’ and ‘dry’ are colexified only in one single language, i.e. Avikam (a Kwa language from the Nyo branch, spoken in the South of Côte d’Ivoire) where the word *wru* means ‘hot/dry’.

In Tsuvadi (a Benue-Congo language from the Kainji branch, spoken in North-West Nigeria), there is no exact colexification, but the word *ulili* occurs as a noun with the meaning ‘dry season’ and as a qualifier with the meaning ‘hot’.

[5] The consultant was asked about the word’s meaning: “C’est là comme par exemple dire *pjën pët* [“be very black”]. Cela traduit l’insistance” [This is here like, for example, saying *pjën pët* [“be very black”]. It translates emphasis].

[6] Accessed through *Reflex* https://reflex.cnrs.fr/core/Outils/hompol.php?lg=en [accessed 18/12/2022]

In Mankanya, these two notions are not colexified but expressed by two different verbs: *p-yiik* ‘be hot’ and *p-kay* ‘be dry’.

(2) *‘Cold’ and ‘quiet’*
The results for the pair ‘cold’ and ‘quiet’ are a little more significant, as shown in Table 6. The synesthetic metaphor between ‘cold’ and ‘quiet’ is attested in several languages, including other Atlantic languages, one from the North branch (Basari) and one from the Bak branch (Bijogo). In Mankanya, the stem *joob* is used principally with the meaning of ‘cold’ but can also refer to ‘quietness’. The verb *p-joobëţ* has the following meanings in Gaved (2004: 16), ‘être frais, être froid’, ‘se calmer, se taire’, ‘être en bonne santé’[7] ; which brings it close to the meaning of the verb *p-yomp*: ‘se taire, garder le mutisme’[8] . The opposition hot-cold guilt also metaphorically: Gaved (2004: 25) defines the verb *p-yiik* as ‘faire chaud, brûler’ and add the expression *p-yiik p-ñak* ‘avoir le sang chaud, être impétueux’[9].

Table 6: Colexification of ‘cold’ and ‘quiet’ in African languages (obtained from the ***Reflex*** database)

Language	Word	Meaning in the source	Source[10]
Bijogo-Kagbaaga (Atlantic, Bak)	*jiroŋ*	***froid***, ***calme***, timide (être); manquer de	Segerer (2002)
Basari (Atlantic, North)	*a-fèm*	***être froid***, ***tranquille***	Ferry (1991)
Ewe (Kwa, Gbe)	*fáfe ́ ~ fáfɛ ́*	- ***froid***, frais, humide, glacial - ***calme***, doux, ***paisible***, ***quiet***, ***tranquille***, modeste, bénin, docile, facile, tranquillement	Rongier (2003)
Soninke (Mande, Western)	*mùllê* *mùra ́*	***froid***, ***calme***, lent ***être froid***, ***être calme***	Creissels (2016)
Cakali (Gur, Gurunsi)	*sʊɔnɪ*	1. ***to be cold*** 2. ***to be quiet***, soft, low-toned or hushed 3. to be happy 4. to be slow 5. to be wet	Brindle (2017)
Kwakum (Benue-Congo, Bantu A)	*fɔ̂láàwɛ ̀*	***froid; paisible***	Njantcho Kouagang (2018)
Saamia (Benue-Congo, Bantu J)	*óxùŋìta ́*	a. ***be cold*** b. ***be quiet***	Botne (2006)

[7] Translation by the author: (1) *be fresh, be cold*, (2) *calm down, hush*, (3) *be healthy*.
[8] Translation by the author: *Hush, keep silence*.
[9] Translation by the author: *Have warm blood, be impetuous*.

Gungu (Benue-Congo, Bantu J)	*kɨnamu*	1. ***cold*** 2. ***calm*** 3. wet; neither dry nor warm 4. Tasteless; neither sweet nor bitter	Robert and Diprose (2012)

(3) '*quiet' and 'wet'*

The semantic net built by the first two pairs raises the question of the semantic proximity between 'quiet' and 'wet' as well. The *Reflex* tool for homonymy and polysemy confirms this hypothesis to a certain extend in some languages: Cakali, Gungu and Mwan (Eastern Mande), and Ewe (see Table 6). In Mankanya, the verb *p-boy* has two meanings 'be wet' and 'be shy' (Gaved 2004: 12).

These three pairs are building up a semantic net summed up in Figure 1. Considering the small numbers of ideophones in the language, one can hypothesize that being in a semantic system (including colours) with other ideophones can become a motivation for these ideophones to become more stable in time.

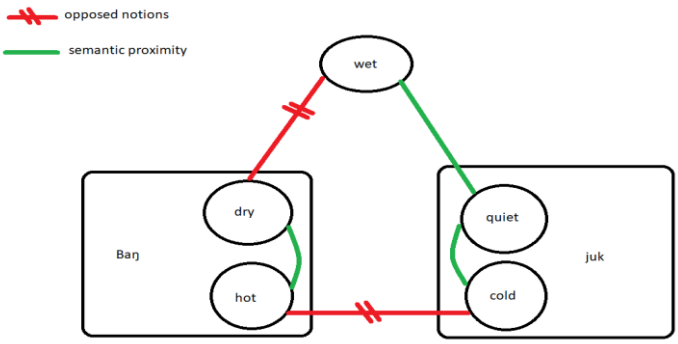

Figure 1: Semantic net of ideophones in Mankanya

There are other observations coming from the data analysis (Montébran 2022: fieldnotes). Thus, one verb *p-yiik* 'be hot' can occur with two different intensifiers: *baŋ* and *şuuy*. The verb *p-yiik* can be used with two different intensifiers *baŋ* (which is frequently used) and *şuuy* (more rarely used), as in examples (5) and (6).

(5) *u-* *leef* | *u-* *yiik* ***baŋ***
CLF2SG- body | CLF2SG- be_hot **ID**
'The body is very hot.'

(6) *u-* *leef* | *u-* *yiik* ***şuuy***
CLF2SG- body | CLF2SG- be_hot **ID**
'The body is very hot.'

As mentioned above, this verb is polysemic and has concrete as well as metaphorical uses. In this study, both ideophones have been used with the concrete meaning of the verb. One can suppose that *baŋ* replaced *şuuy* because of the notional net described above, but a specific study would be necessary to answer this question.

2.4 Phonological features of Mankanyan ideophones

This section deals with phonological characteristics of Mankanyan ideophones, on the one hand, and with sonorous consistency between the modified word and its intensifier, on the other hand. Cross-linguistically, ideophones generally show phonological particularities which make them sound differently than the other words of the language. However, this claim is not supported by the Mankanyan data. Considering the syllabic structure, Gaved (2020: 114) states that Mankanyan ideophones are monosyllabic and show a CVC-pattern. Trifkovič (1969: 2) claims that this pattern is the basic word structure, followed by CVVC (where VV stands for a long vowel)[11]. Doubts could arise considering the word *şuuy*, but /y/ is a semi-consonant and shows up in word final position quite frequently (*p-kay* 'be dry', *p-boy* 'be wet, be shy' etc.). All sounds occurring in ideophones are, thus, found in the language, and in all possible positions in a word. Gaved (2020: 114) also mentions that there are "no marginal or non-phonemic sounds" in ideophones. To sum up, Mankanyan ideophones have a common syllabic structure, and possess neither non-inventory nor marginal phonemes. In addition, Mankanyan ideophones never occur repeated or reduplicated in the analysed data (Montébran 2022: fieldnotes).

One can ask if the sound form of the ideophones is related to the form of the modified qualifier. Cross-linguistically, ideophones may involve, for example, the reduplication of a syllable of the modified word, or there may be vowel harmony. This is not the case in Mankanya, but there is some consistency, especially concerning vowels.

Indeed, in half of the collocations the qualifier and its ideophone have the same vowel: *p-kay baŋ*, *p-ñow lot*, *p-jën pëţ*, *p-jinţ piş, p-tam rad*, and *p-nak-kaŋ*. In the other half, there is a front/back consistency: *p-faat feh*, *p-joobëţ juk*, *p-yomp juk*, *p-yiik baŋ*. These two types of consistency do not apply to two pairs: *p-jeenk jud* 'be very red/ripe' and *p-yiik şuuy* 'be very hot'. These two pairs could be considered from the point of view of vowel height, but there are not enough data to conclude about it.

At the consonant level, consistency is not so obvious, aside from the three pairs in which the words share the same initial consonant: *p-faat feh* 'be very white', *p-jeenk jud* 'be very red' and *p-joobëţ juk* 'be very cold'. This sound consistency has been named by Nicolas Quint (p.c.) as 'phénomène d'écho dégradé'[12]. This phenomenon allows to consider ideophones as depictive words in that they reinforce the sound of the intensified or emphasized word.

2.5 Syntactic and morphological features of Mankanyan ideophones

Ideophones always occur after the modified qualifier. Thus, the structure of the clause is NP IPS-V-(TAM) ID. The ideophone is invariable, i.e. there is no agreement between the qualifier and its ideophone. It is almost impossible to add something between the qualifier and its ideophone. The only possibility is to compare the subject of the clause with another element on the basis of the quality conveyed by the modified qualifier. In examples (7) to (10) from Montébran (2022: fieldnotes), the qualifier and its ideophone are typed in bold, and the frame indicates the comparing element.

[11] "Ainsi les consonnes apparaissent le plus souvent aux limites du lexème qu'il s'agisse de la forme-canon CVC, suivie de CVVC, ou d'autres formes courantes (CVCVC, CVCC, CCVC, etc.). Par contre, les voyelles occupent de préférence la position interne" (Trifkovič 1969: 2)

[12] Translation by the author: eroded resonance phenomenon.

(7) *ka-* *toh* ***ka-*** ***yompandër*** | *ji* *p-* *nguran* | ***juk***
CLF3SG- house **CLF3SG-** **be_quiet** | like CLF4SG- cemetery | **ID**
'The house is very quiet like a cemetery.'

(8) *Nduba* *a-* ***jën*** | *ji* *p-* *hil* | ***pëţ***
PN 3SG- **be_black** | like CLF4SG- coal | **ID**
'Nduba is very black like coal.'

(9) *ka-* *misa* *ka-* ***faat*** | *ji* *ø-* *sukër* | ***feh***
CLF3SG- shirt CLF3SG- **be_white** | like CLF8SG- sugar | **ID**
'The shirt is very white like sugar.'

(10) *p-* *maŋa* *pa-* ***jeenk*** | *ji* *p-* *nkamatu* | ***jud***
CLF6SG- mango CLF6SG- **be_red/ripe** | like CLF6SG- tomato | **ID**
'The mango is very ripe like the tomato.'

Although this is not frequent, ideophones can also occur in negative clauses and questions, as shown by the examples (11) to (18) also from Montébran (2022: fieldnotes). Consider the following examples where the ideophones are typed in bold, and the frame specifies their scope.

(11) *u-* *pi* | *u-* *jën* ***pët*** |
CLF2SG- goat | CLF2SG- be_black **ID** |
'The goat is very black.'

In Mankanya, the negation marker is prefixed to the verb stem. Its scope is the predication binding the subject of the clause to the qualifier, i.e., the entire clause. Negation does not interfere between the qualifier and its ideophone, meaning that the ideophone is not negated, even if it occurs in negative sentences.

(12) *u-* *pi* | *u-* *-un-* *jën* ***pët*** |
CLF2SG- goat | CLF2SG- -NEG- be_black **ID** |
'The goat is not very black.'

Questions are marked by a question marker *i* occurring at the end of the clause.

(13) *u-* *pi* | *u-* *jën* ***pët*** | *i*
CLF2SG- goat | CLF2SG- be_black **ID** | QM
'Is the goat very black?'

The negation and question markers can co-occur in the same clause.

(14) *u-* *pi* | *u-* *-un-* *jën* ***pët*** | *i*
CLF2SG- goat | CLF2SG- -NEG- be_black **ID** | QM
'Is not the goat very black?'

The same goes also for the collocation *p-nak kaŋ*:

(15) *a-* *de* *na* *p-* *nak* ***kaŋ***
3SG- eat with CLF4SG- daytime **ID**
'He is eating in broad day light.'

With negation:

(16) *a-* *de* *na* *p-* *-an-* *nak* ***kaŋ***
3SG- eat with CLF4SG- -NEG- daytime **ID**
'He is not eating in broad day light.'

With a question marker:

(17) *a-* *de* *na* *p-* *nak* ***kaŋ*** *i*
3SG- eat with CLF4SG- daytime **ID** QM
'Is he eating in broad day light?'

With negation and a question marker co-occurring:

(18) *a-* *de* *na* *p-* *-an-* *nak* ***kaŋ*** *i*
3SG- eat with CLF4SG- -NEG- daytime **ID** QM
'Is not he eating in broad day light?'

2.6. Are Mankanyan ideophones a word class?

Mankanya has a limited number of ideophones, whereas in other Atlantic languages, and in particular, in the Bak branch, i.e. Joòla and Balante languages, ideophones are much more numerous[13]. During the field trip, we were faced with the difficulty of collecting ideophones, whereas other linguists usually report the ease of finding ideophones (notably, in texts). These two arguments confirm the idea of a non-productive small, closed group (Gaved 2020: 114), into which no new words could be included.

Apart from ideophones, the definition "closed list of modifiers occurring in very strict collocation rules" also defines the class of adverbs, as "adverbs modify verbs, and some can also modify nouns or a limited number of adjectives" (Gaved 2020: 111). Indeed, ideophones and adverbs share the same function and characteristics: they are modifiers and occur with verbs or adjectives; they are obligatory following the head word; are invariable (that is: there is no agreement between an ideophone or an adverb and the modified word); and occur in restricted collocation.

Based on these considerations, one can conclude that Mankanyan ideophones appear as a subgroup within the class of adverbs. The homogeneity of this subgroup comes from the phonological and semantic features shared by its members.

[13] Actually, this small number of ideophones is also characteristic of the two closest related languages – Manjanku and Pepel.

3. Depictive verbs in Mankanya

Depictive verbs are fully integrated in the lexicon and behave like all other verbs. Morphologically, they are characterized by the reduplication of their stem. The reduplication indicates that the action encoded by the stem is performed several times, which amplifies their iconicity. For example, *p-kobkob-an* 'to knock on the door' is derived from *p-kob* 'to hit'.

Thus, the collected verbs have been divided into two groups: the first group (19) contains depictive verbs built by the reduplication of a verbal stem which also exists as a lexical verb, while the second (20) unites depictive verbs built by the reduplication of a verbal stem which is not attested in the lexicon (one may suppose that the stem has been lost, which frequently occurs in languages having a strongly derivational verbal morphology, as shown by Quint (2010)).

(19) *p-kobkob-an* 'to knock on the door' < *p-kob* 'to hit'
p-lëklëk-an 'to shake something' < *p-lëk* 'to shake only once'
p-falfal-an 'to cut something in small pieces' < *p-fal* 'to cut'
p-fëlfël-an 'to spread, disseminate something' < *p-fël* 'to throw'
p-bambam-an 'to mend something' < *p-bam* 'to sew, patch'

(20) *p-ñalñal-an* 'to tickle someone'
p-tëktëk-an 'to tickle someone'
p-mapmap-an 'to grope something'
p-matmat-an 'to train, coach someone'
p-ʈëlaʈëla 'to be confused'
p-kikakika 'to grind'
p-rëbarëba 'to be rough'

The majority of the Mankanyan depictive verbs from (19) and (20) are causative verbs (marked by the causative suffix *-an*). In both groups, the verbs are characterized by reduplication which has depictive properties stressing iconicity (particularly visible in (19)).

These depictive verbs do not seem to exhibit any specific sound-meaning correspondences and are not restricted to certain verb classes (there are action verbs as well as stative or mental verbs in the data). It is not clear whether they all have a verbal origin, or whether they are derived from nominal stems. This point can constitute the subject of further research.

Conclusion

This chapter has explored sound symbolism in Mankanya looking at three different word classes: onomatopoeias, ideophones, and depictive verbs. The analysis of the obtained data sheds light on the two main functions of sound symbolism in the Mankanya language: the expressive and the emphatic ones. It also makes possible to define some recurring sound-meaning correspondences, even if these are still to be confirmed with more data. One can also confirm that reduplication is a marker of salience in Mankanya: it is used in standard verbal flexion for focus and has an important role in iconicity.

This paper also reveals that previously attested ideophones have been lost in Mankanya and in the closest related languages, indicating the need of a dedicated study in the diachrony of ideophones in the Manjaku subgroup of Mankanya.

Abbreviations

CLF	nominal classifier	O	object
CTF	centrifugal	Ø	zero marker
ID	ideophone	PL	plural
INF	infinitive marker	PN	proper noun
IPFV	imperfective	QM	question marker
IPS	indice personnel subject	SG	singular
NEG	negation	TAM	tense-aspect-mood
NP	noun phrase	V	verb

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Echoes of meaning: Exploring iconicity in Nivkh

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Abstract

This article examines different forms of iconicity in Nivkh (Amuric), categorizing them into gestalt, relative, and imitative types. Gestalt iconicity is reflected, first, in stem reduplication, which plays a key role in marking intensity, plurality and distribution, and second, in vocal gestures, which include repetition and specific consonant-vowel combinations that evoke sensory experiences related to sound and motion. Relative iconicity appears in systematic sound modifications, such as vowel lengthening and raising, as well as consonant voicing, which convey distinctions in size, duration, or distance. These patterns align with cross-linguistic tendencies, such as the association of high vowels with smallness and voiced obstruents with intensity. Imitative iconicity is particularly prominent in onomatopoeia, where phonetic features correspond to the acoustic properties of the sounds they represent. For example, palatal stops frequently occur in words for water-related sounds, while trills and velar stops are common in words describing creaking noises. These patterns illustrate how phonetic structures contribute to meaning in Nivkh, offering insights into broader typological and cross-linguistic perspectives on iconicity and sound symbolism.

Keywords*: iconicity, sound symbolism, structural iconicity, Nivkh, Amuric*

Introduction

Nivkh (also known as Gilyak) is one of the two closely related languages that constitute the Amuric language family, spoken in the Lower Amur basin and on the north-western coast of Sakhalin Island in Russia. Although the Amuric family is often classified as an isolate (Gruzdeva & Janhunen 2025), it has traditionally been grouped under the broad Paleosiberian or Paleoasiatic category, alongside several unrelated languages of Northeast Asia. Together with its sister language, Nighvng, spoken on Sakhalin Island, Nivkh forms a continuum of distinct varieties. Due to the almost complete language shift to Russian, Nivkh is now highly endangered, with no more than 25 speakers remaining by 2025.

Iconicity – understood in this article as "the perceived resemblance between linguistic form and meaning" – plays a significant role in Nivkh. It encompasses various types of similarity-based relationships, including both phonetic associations (sound symbolism) and structural patterns that reflect meaning. While iconicity is often associated with direct sound imitation, it extends beyond onomatopoeia "by recruiting other aspects of the speech signal (e.g. temporal unfolding, intensity, and articulatory dynamics) to depict aspects of meaning" (Dingemanse et al. 2015: 605).

This article explores different types of iconicity in Nivkh, highlighting how phonetic and structural features reflect meaning in a systematic way. Iconicity manifests itself in several types of phenomena, which, in Nivkh, fall under "gestalt", "relative", and "imitative" iconicity – these categories are presented under different terminology in (Dingemanse 2011; Sidhu & Pexman 2018; Johansson et al. 2020); and in other studies.

Various aspects of iconicity in Nivkh have been discussed in previous works, particularly in relation to ideophones, onomatopoeia, and sound symbolism in general. The most extensive analysis of Nivkh ideophones in terms of semantics and syntax was provided by Panfilov

(1965: 15, 197–205). Additional discussions on the properties of this category and its connections to other linguistic phenomena can be found in Jacobson (1971); Kreinovich (1973, 1979); Otaina (1978); Gruzdeva (1997, 2015); and Nedjalkov & Otaina (2013). The most detailed typological study of Nivkh onomatopoeia to date appears in Gruzdeva (2024a), while various aspects of Nivkh (and Nighvng) sound symbolism were explored by Austerlitz (1994). In the following discussion, I will refer to these studies and relevant examples from the literature and my own fieldwork data. A large number of examples comes from the recently published collection of Nivkh texts (Temina et al. 2024).

After presenting the basic features of Nivkh phonology and grammar (Section 1), the discussion begins with *gestalt iconicity*, which captures holistic structural correspondences in linguistic patterns (Section 2). Then it then moves on to *relative iconicity*, where phonetic contrasts evoke meaning through systematic relations (Section 3). The analysis concludes with *imitative iconicity* or "onomatopoeia", the most direct form of sound-meaning correspondence (Section 4). The conclusion summarizes the findings of the article. Through this examination, the article demonstrates how iconicity operates at multiple linguistic levels in Nivkh, from abstract structural principles to tangible phonetic phenomena.

1. Nivkh: An introduction

Nivkh is a (poly)synthetic language with a complex phonological system and predominant suffixation, see most recently (Gruzdeva 2024b).

The phonological system has a six-vowel inventory, shown in Table 1. In terms of tongue advancement, the vowels form a balanced paradigm, organized into three distinct classes: two front vowels (*i*, *e*), two central vowels (*ɨ, a*), and two back vowels (*u*, *o*). There are three high vowels (*i, ɨ, u*), two mid vowels (*e, o*), and one low vowel (*a*).

Historically, vowel length was not a phonemic feature within the language. In contemporary Nivkh, however, long vowels *i:*, *a:*, *u:*, *o:* have emerged as a result of the loss of fricatives, cf. **haʁs* > *ha:s* 'clothes', **ŋɨɣs* > *ŋɨ:s* 'teeth'. These long vowels are now contrasted with their short counterparts, although this distinction is restricted to a limited number of lexical items, cf. **ayri* > *a:ri* 'spittle' vs. *ari* 'northern wind'. Vowel lengthening can be used for emphasis (see Section 3). Long vowels are also attested in some onomatopoeic words, cf. *o:n o:n* 'wind whistling', *qa:χ qa:χ* 'dog squealing' (see Section 4).

Table 1: The basic vowel inventory of Nivkh

	front	**central**	**back**
high	i	ɨ	u
mid	e		o
low		a	

The consonant inventory of Nivkh contains the 32 phonemic segments shown in Table 2. The subsystem of obstruents is most elaborated and accounts for the richness of the entire consonant system. There are five distinct sets of obstruents: (basic=weak; aspirated=strong; voiced) and two for fricatives (voiced=weak; voiceless=strong).

The opposition within two original sets of stops and fricatives can be described in terms of single laryngeal contrast, which surfaces as aspiration in stops and as voicing in fricatives. Voiced

stops form a marginal group, having evolved in specific phonological contexts, particularly following nasal consonants, cf. **c^{h}armp* > *c^{h}armb* > *c^{h}arb* ‘silk’, **qomp* > *qomb* > *qob* ‘ladle’. Voiced stops occur word-initially in the citation forms of native words only in a limited number of cases, e.g., in the proper names *Beŋik, Dagi, Gudan,* in loanwords and in the case of intensification (see Section 3.3).

Table 2: Consonant inventory of Nivkh

			labial	**dental**	**palatal**	**velar**	**postvelar**
obstruents	***stops***	voiced	b	d	ɟ	g	ɢ
		basic (weak)	p	t	c	k	q
		aspirated (strong)	p^h	t^h	c^h	k^h	q^h
	fricatives	voiced (weak)	v	r	z	ɣ	ʁ
		voiceless (strong)	f	r̥	s	x	χ
sonorants	***nasals***		m	n	ɲ	ŋ	
	approximants			l	j		h

The nucleus of a syllable in Nivkh can only be formed by a vowel. Most nouns are monosyllabic and frequently feature rich initial and final consonant clusters, with a maximum structure of CCVCCC. Within a single morpheme, root-initial clusters can include up to two consonants, while medial and root-final clusters may contain as many as three.

With respect to vowel harmony, the vowels may be categorized into two harmonic sets: high (*i*, *ɨ, u*) and low (*e*, *a*, *o*). The original root-controlled pattern of vowel harmony has been only partially retained in the modern Nivkh. Remnants of this system remain most evident in pronominal prefixes, pronominal case forms, certain transitive verbs, and case suffixes. In these domains, vowel harmony operates regressively, meaning that the vowel of the first monosyllabic morpheme is influenced by the vowel of the initial syllable in the following morpheme, cf. *ŋi-řlɨ* ‘my sky’ vs. *ŋe-řla* ‘my harpoon’.

The most productive word-formation processes in Nivkh include suffixation and compounding.

Nominal morphology encodes number distinctions through an unmarked singular and a plural marked by the suffix *-Ku*, cf. *qan-* ‘dog’ > *qan-gu* ‘dogs’. Additionally, reduplication of nominal and verbal stems is used to express the plurality of events (see Section 2.2).

Table 3 presents the basic forms of Nivkh personal pronouns. These forms align with Traunmüller’s (1996) cross-linguistic observation on iconic nature of personal pronouns that first-person singular pronouns tend to include nasals, cf. *ŋi* ‘I’, while its second person counterpart tends to contain stops, cf. *c^{h}i* ‘you’.

Demonstratives form a complex deictic system, which in Nivkh comprises four basic distance categories (Gruzdeva 2020). The contrast is marked by the opposition of vowels and

consonants: *tɨŋ* ‘proximal one’, *hɨŋ* ‘close one’, *aŋ* / *ahɨŋ* ‘distal one’, *ae:hɨŋ* ‘remote one’. All demonstratives contain the same high vowel *ɨ*, but the more distal forms begin with the low vowel *a*. This partly confirms the findings of Utan (1978); Woodworth (1991); and Traunmüller (1996), who claim that deictic proximal words such as ‘this’ often contain high, front, unrounded vowels, while words meaning ‘that’ contain low, back, rounded vowels.

Table 3: Personal pronouns in Nivkh

1SG	1DU	1PL INCL	1PL EXCL	2SG	2PL	3SG	3PL
ɲi	*megi*	*mer*	*ɲiŋ*	*cʰi*	*cʰiŋ*	*if*	*imŋ*

Nivkh does not have a separate class of adjectives that would be morphosyntactically distinct from verbs. The majority of Nivkh verbal stems, regardless of their meaning, may function as adnominal modifiers (= participles) preceding the head nominal. There are about 400 verbs denoting qualities, many of which carry the suffix *-la-* indicating a permanent property, cf. *kɨ-la-* ‘be long’, *pi-la-* ‘be big’. Nominalized (participial) forms of verbs are represented in Nivkh by a bare stem. Synchronically, these forms can be seen as a case of zero-nominalization, but diachronically they also contain the nominalizer **-ŋ*, cf. *ur-la-* ‘be good’ > **ur-la-ŋ* > *ur-la* ‘good’.

At the level of the simple clause, Nivkh displays some features of isolating structure, especially with respect to core arguments, which are typically unmarked. The syntax follows a nominative-accusative pattern, with a basic word order of [(TOPIC) (SUBJECT) OBJECT PREDICATE] (SOV). All modifiers except numerals and quantifiers precede the head nominal.

At the level of the simple clause, basic syntactic relations can be described as follows. There are three core arguments: subject, primary object, and secondary object. Intransitive verbs occur with the unmarked subject. Monotransitive verbs synthesize with an unmarked primary object, which functions as either a patient or a theme. Ditransitive verbs, on the other hand, take a recipient, goal, or source as the primary object, but do not combine with a patient or theme. All three core arguments are unmarked.

A primary object combined with a head verb, as well as a determiner or a modifier combined with a head nominal, form a synthetic complex resembling incorporation (Mattissen 2003, 2017). cf. *ɻa-* ‘roast (sth)’: *cʰo+ɻa-* [fish+roast] ‘roast fish’, *ɻa+cʰo* [roast+fish] ‘roasted fish’. The synthetic complex functions as a single phonological word with a fixed, non-variable order. The complex exhibits regular morphophonological alternations, particularly at the boundaries between lexical and grammatical morphemes.

In a complex sentence, subordinate clauses are represented by complement, relative, or adverbial clauses. Adverbial clauses are formed by converbs of different origins and are arranged in chains that conclude with the main clause. The latter typically occurs at the end of the sentence and is composed around a clause-final finite form.

Converbs render various interclausal relations (temporal, conditional, concessive, cause, purpose, manner, etc.), with a particularly fine differentiation being made within the temporal converbs.

A large class of Nivkh *ideophones* include items that express auditory (*kudɻ kudɻ* ‘crunching snow under the sledge’), visual (*kiɲ kiɲ* ‘staggering with exhaustion’), tactile (*homk homk* ‘sticky, unpleasant to the touch’) or mental (*qʰorχ qʰorχ* ‘stupid’) images, as well as their various combinations (*laq laq* ‘smooth and shiny’). These words are typically monosyllabic,

and frequently occur in repetitive sequences, creating a sense of multiplicity. Like in many other languages, ideophones in Nivkh are loosely integrated into the sentence and are often emphasized through lengthening.

2. Gestalt iconicity

Gestalt iconicity refers to a "holistic resemblance between the structure of a word and the event or concept it represents". As noted by Johansson et al. (2020), this type of iconicity reflects structural similarities between words and the perceived events they evoke, often associated with iterated or intense actions.

In Nivkh, gestalt iconicity is often expressed through the reduplication of noun and verb stems, a key grammatical feature that creates a direct and perceptible link between form and meaning. Reduplication structurally mirrors cognitive categories such as repetition, plurality, intensity, duration, and distribution through the repetition of linguistic elements. Reduplication plays a central role in Nivkh grammar, particularly in marking intensity and various types of plurality (Section 3.1). However, unlike in many other languages, reduplication in Nivkh does not typically mark prolonged duration, continuity, or emphasis.

Another type of gestalt iconicity relates to the way in which speech sounds reflect perceptual and conceptual properties through their articulatory features, such as lip rounding, constriction, or repetition. This creates a structured mapping between sound and meaning, reinforcing the idea that phonetic forms are grounded in human perceptual and motoric processes. In Nivkh, this phenomenon is particularly evident in vocal gestures typical of ideophones (Section 2.2)

2.1. Reduplication

Reduplication often conveys heightened intensity, especially in emotional or exaggerated contexts. By repeating a base form, the language imitates the reinforcement of a property or event, making it perceptually salient. In Nivkh, reduplication typically involves a single copy.

Reduplication is often applied to adverbials of various origins, intensifying their meaning, cf. *eɣgut~eɣgut* <quickly:1SG~RED> 'very quickly', *ɨɣrɨkon~ɨɣrɨkon* <old_times~RED> 'in very old times', and examples (1-3).

(1) *ɲi* *qalm-ux* ***cɨk~cɨk*** *hum-ɟ.*
1SG Kal'ma-ABL long~RED live-IND
'I lived in Kal'ma for a very long time.' (Temina et al. 2024: 88)

(2) *tʰɨr+kʰnɨk* *vi-ŋan* ***maŋgut~maŋgut*** *mɣe-ni-ɟ.*
Tyr+cliff go-CVB.ANT/SIM strongly:2PL~RED row-FUT-IND
'When [you] go to the Tyr Cliff [you] will row very hard.' (Temina et al. 2024: 140)

(3) *tʰɨr-ɟ* ***tʰil-f-toχ~tʰil-f-toχ*** *j-ama-ɟ.*
look-IND be_far_away-NMLZ.LOC-DAT~RED 3SG-look-IND
'Look [around], look far and far away.' (Temina et al. 2024: 140)

Reduplication of a verb stem is another frequent process employed for intensification. In Nivkh, it applies to at least fifty qualitative verbs acting as adnominal modifiers (Otaina 1978: 56; Gruzdeva 2015: 281), cf. *ŋarla-* ‘be fat’ > *ŋarla~ŋarla-* ‘very fat’, *pʰŋaʁ-* ‘be young’ > *pʰŋaχ~pʰŋaʁ-* ‘be very young’, and examples (4-5).

(4) ***kiŋnu-la~kiŋnu-la****+paχ-ku* *malʁo-ʁar.*
be_beautiful-PERM~RED+stone-PL be_many-CATEG
‘stones, [there] are a lot of very beautiful stones.’ (Temina et al. 2024: 134)

(5) ***pil-kar~pil-kar****+pʰirk-ɣo* *hiɟ-ɣo* *irti~irti* *viɲir-ɟ.*
be_big-AUG~RED+carp-COM.PL that_one-COM.PL always~RED cook-IND
‘[As to] large carp, [she] always boiled them.’ (Temina et al. 2024: 50)

If a verb root begins with a voiceless stop, the latter may undergo voicing in the process of reduplication, which is caused by the historical nominalizer **-ŋ*: **pila-ŋ* ‘big’ > **pila-ŋ~bila-ŋ* > *pila~bila* ‘very big’, **tuzla-ŋ* ‘cold’ > **tuzla-ŋ~duzla-ŋ* > *tuzla~duzla* ‘very cold’, **kɨla-ŋ* ‘long’ > **kɨla-ŋ~gɨla-ŋ* > *kɨla~gɨla* ‘very long’.

Many languages use reduplication to indicate plural forms, repeated actions, or distributed events. The repetition of a word segment iconically represents the recurrence or increase of its referents, as can be seen in Nivkh, where reduplication signals multiple entities or actions.

As noted above, synchronically Nivkh plural forms are formed by suffixation. However, Panfilov (1962: 96) hypothesizes that reduplication is the original and predominant strategy for marking plural number in Nivkh. Evidence for this claim can be found in examples from folklore texts, such as *ciɣř~ciɣř* ‘trees’ in (6). However, the distributive meaning cannot be excluded in this case (see discussion below).

(6) *ivŋ+tɨf+tul-ɣu=paᵍrk* *pal-ux* *hum-ta* ***ciɣř~ciɣř***
3PL+house+hole-PL=only forest-ABL be-COORD.3PL tree~RED
pant-ɣɨr-ta ... *vax* *pant-ɣɨt-ra.*
grow-COMPL-COORD.3PL moss grow-COMPL-COORD.3SG

‘There are only holes of their houses in the forest, trees have grown up, moss has grown up.’ (Panfilov 1965: 242)

There are also some rare examples like *ɲivɣ~ɲivɣ-gu* ‘people’ in (7), where both reduplication and suffixation are used together as markers of plurality, but again the distributive interpretation is also possible here.

(7) *if* ***ɲivɣ~ɲivɣ-gu****+kʰez-ɟ.*
3SG man~RED-PL+tell-IND
‘He told [various] people.’ (Panfilov 1962: 97)

Multiplicative plurality, defined as the repetition of actions within a given period of time by the same participant or participants[14], is expressed in Nivkh primarily through the process of reduplication of the verbal stem. Two derivational paths are possible in this case.

Firstly, multiplicatives can be derived from a simple verbal stem with a semelfactive (momentary) meaning, cf. *za-* 'knock' > *za~za-* 'knock (repeatedly)', *xici-* 'raise' > *xici~xici-* 'wave', *varqo-* 'lay (sth) on (its) side' > *varqo~varqo-* 'swing (on the waves)', cf. *carq-* 'jump (once)' > *carq~zarq-* 'jump' in (8):

(8) *ŗag* *laqr* ***carq~zarq-c=hata?***
where squirrel jump-IND=Q
'Where was the squirrel jumping? (Gruzdeva & Bugaeva 2022: 183)

Secondly, multiplicatives can be derived from ideophones, which contain two repeated segments. One of the derivation paths involves the simple merging of two ideophone segments into a single stem, which is then converted into a verb form without any additional morphological marking (though with the occasional addition of a stem-final vowel), cf. *t^{h}uŋ t^{h}uŋ* 'knocking on the wooden object' > *t^{h}uŋ~t^{h}uŋa-* 'knock on the wooden object', *k^{h}af k^{h}af* 'clanging' > *k^{h}af~k^{h}af-* 'clang', *ŋaw ŋaw* 'mewing' > *ŋaw~ŋaw-* 'mew'.

Distributive plurality refers to repeated actions that are performed at the same period of time by non-identical participants. Noun reduplication typically marks the distribution of instrument and locative participants, cf. *eri* 'river' > *eri~eri-jn* <river~RED-LOC> 'in rivers' in (9), and *naχ* 'bunk' > *p^h-naχ~p^h-naχ* <REFL-bunk~RED> 'on their own bunks' in (10):

(9) *tolvɨt-ŋan* *q^{h}otr* ***eri~eri-in***
be_summer-CVB.ANT/SIM bear river~RED-LOC
c^{h}o+ŋɨŋ-r *i-jn-ra…*
fish+look_for-CVB.NAR.3SG 3SG-eat-COORD.3SG
'In summer, looking for fish in [different] rivers, a bear eats…' (Panfilov 1962: 97)

(10) *i-jn-tot* *erk* *oz-ta*
3SG-eat-CVB.DIST.3PL already get_up-COORD.3PL
p^h-naχ~p^h-naχ+*t^{h}iv-ta.*
REFL-bunk~RED+sit-COORD.3PL
'Having eaten, [they] already stood up, sat down on their bunks…' (= 'each one sat down on his/her own bunk') (Nedjalkov and Otaina 2013: 50)

The distribution of the other participants is marked by the reduplication of a verbal stem. In (11) and (12), actions are performed successively by each of multiple participants, whereas in (13), actions are performed successively with each of multiple participants. In (14), an object *oxt* is represented by a mass noun. This means that an action is distributed over different portions of the substance in question:

[14] The definitions used here for different types of plurality (multiplicative, distributive, and iterative) are based on those in (Xrakovskij 1997). Various categories of plurality are discussed in detail in (Gruzdeva 1997, 2022).

(11) *umguo:la* *pʰŋafqŋafq*[15]+***ama~ama-t*** *haʁa-ɟ-ɣu.*
girl REFL+look~RED-CVB.NAR.3PL laugh-IND-PL
'Casting glances (lit. looking) at each other, the girls laughed.' (Nedjalkov & Otaina 2013: 362)

(12) *kɨl-kar* *hagut* ***j-up~j-up-t*** *jnɨŋ*
be_long-AUG so:3PL 3SG-tie_up~RED-CVB.NAR.3PL 1PL.EXCL
vi-tʰa-ɟ.
go-ITER.3PL-IND
'[We] tied up in a long [line] and we rode that way.' (Temina et al. 2024: 55)

(13) *hoʁat* *vi-t* *hɨ+ciɣr-ku* *maŋgut~maŋgut*
like_that:3PL go-CVB.NAR.3PL that+tree-PL strongly:3PL~RED
nɨ-tʰa-ɟ ***e-mq~e-mq-c-ɣu.***
do-ITER.3PL-IND 3SG-cut~RED-IND-PL
'Then [they] go and do a lot to these trees, break them off.' (Temina et al. 2014: 12)

(14) *cʰaχ-uin* *oxt+**vɨzɣ~vɨzɣ-ɟ**.*
water-LOC powder+knead~RED -IND
'[She] stirred the powder in water.' (Saveljeva & Taksami 1970: 61)

Iterative (habitual) plurality refers to repeated actions that are performed at different periods of time by the same participant(s). In the case of nouns with temporal semantics, plain reduplication of noun stems in a nominative, cf. *urk* 'night' > *urk~urk* 'every night' in (15), or ablative, cf. *aŋ* 'year' > 'every year' in *aŋ~aŋ-ux* in (16), case form or reduplication in combination with the clitic *=ŋara* is used to derive iterative adverbs denoting regularly repeated time intervals, cf. *mu:f* 'day' > *mu:v~mu:f* 'every day', *parf* 'evening' > *parf~parf* 'every evening', *loŋ* 'month' > *loŋ~loŋ=ŋara* 'every month' (see the discussion on the reduplicated adverbs above).

(15) ***urk~urk*** *to-ɟ.*
night~RED cry-IND
'Every night [he] cries.' (Temina et al. 2024: 123)

(16) *if* ***aŋ~aŋ-ux*** *cɨk~cɨk* *mu-jnɨ-do* *qʰaw-rot…*
3SG year~RED-ABL long~RED die-DES-DAT NEG-CVB.DIST.3SG
'she didn't get sick for a long time from year to year…' (Temina et al. 2024: 79).

The most common verbal marker of iterative plurality is the suffix *-ɣa-* : *-tʰa-*. However, in certain instances[16], this type of plurality can also be marked by reduplication of the verb stem, cf. (17) and (18). In the example (19), which comprises two subsequent sentences with the meaning of iterative plurality, the verb *e-v-tʰa-ɟ* 'held/took' is used with the iterative suffix,

[15] *pʰ-ŋafq~ŋafq* is a lexicalized reflexive pronoun which can be glossed as <REFL-friend~RED> and is itself formed by reduplication.
[16] The rules for choosing between suffixed and reduplicated forms are not clear and seem to be based on the speaker's preferences.

whereas the verb *i-di~di-ɟ* ‘saw’ has a reduplicated form. It is possible that the latter form has a distributive rather than an iterative meaning.

(17) *imŋ* *manɟu-ɣu-doχ* ***vi~vi-ɟ.***
3PL Chinese-PL-DAT go~RED-IND
‘They [usually] went to [visit] the Chinese.’ (Nedjalkov & Otaina 2013: 820)

(18) *cʰi* *ja:r* *ɲiŋ* *pal-roχ* *mir-ŋan*
2SG why:2SG 1PL.EXCL forest-DAT ascend-CVB.ANT/SIM
to~ro-ɟ=ŋa*?*
cry-RED-IND=Q
‘Why do you cry many times when we climb the forest hill?’ (Nedjalkov & Otaina 2013: 369)

(19) *ɲiŋ* *irti~irti* *aŋ-ujn* *butilk* *ɻajn*
1PL.EXCL always~RED who-LOC bottle where
i-di~di-ɟ *sik* ***e-v-tʰa-ɟ****.*
3SG-see~RED-IND all 3SG-hold-ITER.1PL-IND
‘If we saw anyone with bottles, [we] always took all of them away.’ (Temina et al. 2024:50)

2.2. Vocal gestures

Vocal gestures exemplify gestalt iconicity by aligning phonetic features with the sensory and conceptual properties of the events they describe. A common pattern is the association of certain vocal gestures with shape-related meanings, where articulatory features like rounded vowels or repeated consonants evoke concepts such as roundness or continuity, see, e.g., (Sidhu et al. 2021). These phonosemantic mappings can be explained, at least in part, by perceptual-motoric analogies, as suggested by Thompson and Do (2019).

Examples of this type of iconicity can be found in Nivkh ideophones, which due to their material properties – such as articulatory gestures and phonetic structure – enable iconic mappings between sound and meaning (Dingemanse 2011). Thus, ideophones associated with round shapes tend to share similar phonetic patterns, particularly rounded vowels combined with labial or uvular stops. Examples include *qol qol*, *qor qor*, and *pulx pulx* for the sound of boiling water, *poj voj* for the image of swirling smoke, and *pol vol* for the movement of a rolling object.

These cases illustrate two key links between articulation and perception. The articulatory-motoric link arises from the way rounded vowels and labial/uvular stops require lip rounding and constriction at the back of the mouth, physically mimicking the rounded or swirling movement of the referents. The auditory-perceptual link is seen in their repetitive structure, which enhances the sense of continuity or multiplicity, mirroring the ongoing nature of boiling water or rolling objects. In addition, uvular and labial sounds tend to produce deep, resonant, and rounded auditory impressions, reinforcing the perception of roundness in motion.

3. Relative iconicity

Relative iconicity refers to a meaning that arises from contrasts between sounds, often through systematic relationships rather than direct imitation. Unlike more salient forms of sound symbolism, such as onomatopoeia, relative iconicity operates through comparisons between phonetic elements, creating schematic structured correspondences between form and meaning, which function as "diagrams" (Dingemanse et al. 2015). This principle is evident in various languages, including Nivkh, where phonetic contrasts – such as vowel lengthening, vowel raising, and consonant voicing – are systematically linked to meaning.

One of the best-documented examples of relative iconicity is synesthetic sound symbolism, in which particular phonetic features evoke sensory properties of objects, including shape, size, or texture (Hinton et al. 1994). For instance, expressive intonation patterns, such as deep voice and vowel lengthening, frequently correlate with perceptions of largeness. Similarly, Ohala's (1994) frequency code demonstrates how high-frequency sounds tend to be associated with small size, while low-frequency sounds correlate with large size. This phenomenon illustrates how iconic relations are not necessarily based on one-to-one imitation but emerge through systematic sound-meaning mappings.

In Nivkh, several phonetic phenomena exemplify this type of sound-meaning association. Expressive vowel lengthening (Section 3.1), raising of the vowel *a* to *ɨ* or *i* (Section 3.2), and voicing of initial stops (Section 3.3) all play a role in encoding semantic distinctions in a non-arbitrary manner.

3.1 Expressive vowel lengthening

Expressive lengthening can be seen as form of quantitative iconicity, "which implies that there is a motivated connection between meaning and quantitative aspects of linguistic form, e.g. word-length" (Carling & Johansson 2014: 204). It is a pervasive sound-symbolic feature that enhances meaning through phonetic exaggeration, thereby reflecting intensity, duration, or emotion. This phenomenon is particularly prominent in Nivkh, where expressive or iconic vowel lengthening – often accompanied by an updrift tone – can basically occur in any lexical or grammatical morpheme with an appropriate meaning. While this process can take place in word-initial or word-medial positions, it is most commonly found at the end of a word. The following examples illustrate this feature in more detail.

Vowel lengthening can indicate greater intensity or a higher degree of a property, expressed by a qualitative stem (Gruzdeva 2015: 282). In Nivkh, speakers may lengthen a vowel in the root of a qualitative verb which occurs in a nominalized form, cf. *pilkar* 'big' > *pi:lkar* 'very big', *tolkar* 'fat' > *to:lkar* 'very fat', or in a form of an adverb, cf. *patikur* > *pa:tikur* 'very slowly' (Shiraishi 2006: 21–22). Intensification can also be achieved by lengthening the vowel *a* in the qualitative suffix *-la-*, as in *vaqla+als* 'sour berry' > *vaqla:+als* 'very sour berry' (Panfilov 1962: 22), cf. also *ŋarla* 'fat' > *ŋarla:* 'very fat' in (20). Additionally, vowel lengthening can occur in the augmentative suffix *-kar*, as in *pilkar* 'big' > *pilka:r* 'very big'.

(20) ***ŋarla:****+ɬɨɣi* *cilvɨt-ŋan* *pʰɻ̥ɨ-ɻ̥a-d.*
very_fat+salmon be_autumn-CVB.ANT/SIM come-ITER.3SG-IND
'The fattest salmon comes exactly in autumn.' (Panfilov 1962: 13)

The temporal duration of an action can be emphasized by lengthening the vowel of the verb form, which is typically the last vowel. In (21), it is a lexical root vowel of a corresponding verb form, cf. *razru:-ɻ* ‘taking aim (for a long time)’. Vowel lengthening can also occur in a converbal suffix, such as the final vowel *e* of the converb in *-ke*, which indicates a durative action, cf. *mɨr-ke* ‘while going up’ > *mɨr-ke:* ‘while going up and up’ and *vi-ke:* ‘going (for a long time)’ in (22), cf. similar examples in (Austerlitz 1994). Spatial duration is also marked by vowel lengthening in demonstratives, as seen in *a:ɻ* ‘very distant one’, *a:in* ‘in that (distant) place far away’ (Panfilov 1962: 13).

(21) *hake* ***razru:-ɻ*** *hɨ+pʰoqo+xici-r* ***razru:-ɻ…***
then aim-CVB.NAR.3SG that+bladder+rise-CONV.NAR.3SG aim-CVB.NAR.3SG
‘Then [he] taking aim (for a long time), rising that bladder, taking aim (for a long time)…’ (Shiraishi & Lok 2002: 9)

(22) ***vi-ke:*** *kʰnɨk* *ɲaqr-toχ* *vi-ŋan* *eɲ+cʰeu-ra*
go-CVB.UBSIM cape one-DAT go-CVB.ANT/SIM ski+take_off-COORD.3SG
mɨɣ-r *hurciv-ra.*
come_down-CVB.NAR.3SG sit_down-COORD.3SG
‘Going [for a long time], coming to a cape, [he] took off skis, [and] coming down, sat down.’ (Panfilov 1965: 222)

Vowel lengthening is also typical of the expressive suffix *-a*, which can be attached to the predicate of the sentence, cf. (23) and (24). It is also common in vocatives marked by the formally similar suffix *-a*, cf. (25), and in exclamations, as seen in *ai:* ‘ah’, *askaska: ~ askaskɨ:j* ‘oh (expressing pain)’, *hai:* ‘oh (expressing fright)’, *ɨŋa:j* ‘oh (expressing pain)’, *ɨ:nɨja* ‘it is awful!’ (Panfilov 1965: 208, Otaina 1978: 125). Vowel lengthening is also a prominent feature of ideophones, as in *o:n o:n* ‘hissing of wind’, *hi:n* ‘shouting and crying’, *kulkrɨ:* ‘with eyes wide open’, *tuli:ɻ* ‘hiding and showing oneself’ (Panfilov 1965: 200, 205, 201, 223).

(23) *pila+qʰotr-a:!*
big+bear-EXPR
‘What a big bear!’ (Panfilov 1962: 22)

(24) *kʰinŋu-ɻ-a:* *nama-ɻ-a:!*
be_beautiful-IND-EXPR be_good-IND-EXPR
‘[It] is beautiful, [it] is good.’ (Panfilov 1965: 224)

(25) *tɨ+mur-a:!*
this+horse-VOC
‘This horse!’ (Panfilov 1965: 227)

3.2 Vowel raising

In Nivkh, raising of the vowel *a* to *e*, *ɨ*, or *i* along with their subsequent lengthening into *e:*, *ɨ:*, or *i:* can illustrate iconicity in size (sound-size or sound-magnitude symbolism) and affect (emotional and expressive symbolism). Carling and Johansson (2014: 203–204) define this

type as a *qualitative iconicity*, "which implies that there is a motivated connection between meaning and qualitative aspects of linguistic form, e.g., phonematic or phonotactic structure".

Following Sapir's (1929) seminal work, research on the link between sound and perceived size has expanded significantly, demonstrating that lower vowels (such as *a*) are typically associated with largeness, while higher vowels (such as *e* or *i*) tend to signal smallness. Ultan (1978) found that in almost 90% of the languages he sampled that had diminutive marking, the diminutive was symbolized by high front vowels. Several articulatory and acoustic explanations for this size-related symbolism have been proposed, including those discussed in (Shinohara & Kawahara 2010; Feist 2013; Sidhu & Pexman 2018; Vainio 2021).

One articulatory explanation suggests that lower vowels involve a wider mouth aperture, which may create a perceptual link to larger size. The acoustic explanation, based on Ohala's (1983, 1994) frequency code hypothesis, argues that lower frequencies correspond to larger resonance cavities or resonators, as resonance frequency is inversely correlated with size. Supporting this, the second resonance frequency (F2) has been found to inversely correlate with size judgments in speakers of Chinese, English, Japanese, and Korean (Shinohara & Kawahara 2010).

These observations find confirmation in Nivkh, where the raising of the vowel *a* to *ɨ* or *i* in the suffix *-la-* of qualitative verbs results in a shift of a verb's perceived meaning towards diminutive (Gruzdeva 2015: 280), cf. *pi-la-* 'be big' > *pi-lɨ-r* '[becoming] biggish' in (26), and *ɨki-la-* 'be bad / weak' > *ɨki-li-durŋur hum-ɟ* 'be a little bit weak' in (27).

(26) *v-o:la* *pand-r* ***pi-li-r***
3SG-child grow_up-CVB.NAR.3SG be_big-PERM-CVB.NAR.3SG
nan *u:mu+ŋivx-doχ* *vi-ɟ.*
only fight+man-DAT go-IND
'Only growing up, [becoming] biggish, his son went to the enemy (lit. the fighting man).' (Otaina 1978, 64)

(27) *if* *napa* ***ɨki-li-durŋur*** *hum-ɟ.*
3SG still be_bad-PERM-CVB.BSIM be-IND
'He is still a little bit weak (lit. bad).' (Otaina 1978: 64)

However, in the case of the vowel *a* of the same suffix *-la* being raised, lengthened and stressed, it signifies that the feature denoted by the verb is intensified: *ŋɨz-la+du* 'shallow lake' > *ŋɨz-li:+du* 'very shallow lake' (Panfilov 1962: 24), cf. also *kʰe-la-* 'be thin' > *kʰe-li:-ɟ* '[he] is very thin' in (28). In these examples, lengthening overrides vowel raising and blocks diminutive meaning. The rising of *a* with or without lengthening results in intensification also in qualitative verb roots, cf. *macka* 'small' > *mɨcka* > *mɨ:cka* 'very small', or in the augmentative suffix *-kar-*, cf. *pil-kar* 'big' > *pil-kɨr* > *pil-kɨ:r* 'very big' (Panfilov 1965: 228).

(28) *if* *mu-ini-ke* ***kʰe-li:-ɟ.***
3SG die-DES-CVB.BSIM be_thin-PERM-IND
'Because he is ill (lit. is going to die), he is very thin' (Otaina 1978: 66)

The process of vowel raising can also be employed for emphasis and expressive effect. In Nivkh, the raising of *a* and its subsequent lengthening are very frequently observed in coordinated forms with the suffix *-ra* : *-ta*, cf. *ca-ra* > *ca-re* '[he] beats' and *lu-ra* > *lu-re* '[he]

sings' in (29) and *xu-ra* > *xu-ri* '[he] killed' and *ŋiŋ-ra* > *ŋiŋ-ri* '[he] caught' in (30). These forms create a certain rhythmic structure to the sentence and are very common in narratives.

(29) *hoŋke* *uṛk+huti-ŋan* *cʰam* *qʰas+ca-re*
then night+middle-CVB.ANT/SIM shaman drum+beat-COORD.3SG
lu-re *if* *mi-ɟ.*
sing-COORD.3SG 3SG hear-IND
'Then, at the middle of the night, he hears how the shaman beats the drum and sings.' (Panfilov 1965:223)

(30) *ŋa+xu-ri* *cʰo+ŋiŋ-ri.*
seal+kill-COORD.3SG fish+look_for-COORD.3SG
'[He] killed seals, caught fish.' (Shiraishi and Lok 2002: 11)

3.3 Consonant voicing

Research on size-related sound symbolism has identified an additional pattern of relative iconicity: speakers of many languages tend to associate voiced obstruents with larger objects or images compared to those associated with voiceless obstruents. This phenomenon may stem from phonetic factors such as oral cavity expansion, which creates a perception of larger size (Ohala 1983), and lowering of fundamental frequency (F0), which suggests larger resonating bodies (Shinohara & Kawahara 2010). The relevant examples are attested for instance in Chinese, English, and Japanese.

In Nivkh, size symbolism is linked to a related process where voicing an initial stop in qualitative verbs intensifies the described quality (Gruzdeva 2015: 281). This voicing alternation, which applies to about twenty verbs in their attributive function, reflects a broader pattern where voiced sounds convey greater intensity (Otaina 1978: 57). For example, cf. *pila* 'big' > *bila* 'very big', *kɨla* 'long' > *gɨla* 'very long', and *tuzla* 'cold' > *duzla-* 'very cold' in (31):

(31) ***duz-la****+cʰaχ+ŋa-da.*
very_cold-PERM+water+go_for-HORT.1PL
'Let's go for very cold water.' (Panfilov 1962:7)

4. Imitative iconicity (onomatopoeia)

The first and most fundamental form of iconicity is imitative or "imagic" iconicity (Johansson et al. 2020), also known as "absolute iconicity" (Dingemanse et al. 2015) or "imitative sound symbolism" (Hinton et al. 1994). This type of iconicity, commonly found in the words classified as onomatopoeia, occurs when linguistic sounds mimic real-world environmental or natural sounds, creating a direct representational link between sound and meaning. As Nygaard, Cook & Namy (2009: 181) describe, onomatopoeia is "one of the most obvious examples" of sound symbolism. This phenomenon, where specific phonetic patterns consistently correspond to particular meanings in onomatopoeic words, is widely attested across languages, see Körtvélyessy & Štekauer (2024).

Nivkh onomatopoeic words vary across dialects and individual pronunciation. They are often repetitive, conveying plurality, cf. *keŋ keŋ* ‘mosquito squeaking’, *qʰar qʰar* ‘light scratching’. Most start with a stop and end in a fricative, cf. *qox qox* ‘eagle scream’, *cʰaf cʰaf* ‘clapping’, though other patterns exist, cf. *fas fas* ‘sharp steps’, *uŋ uŋ* ‘mosquito squeaking’. Some end in rare final long consonants, cf. *xurr xurr* ‘fire buzzing’, *cʰall* ‘water splashing’.

Onomatopoeic words follow general Nivkh syllable structures: vowel-only: *a a a* ‘loon crying’, CV: *re re* ‘toad croaking’, VC: *oŋ oŋ* ‘kitten squeaking’, or CVC: *ŋox ŋox* ‘pig grunting’. Initial clusters are limited, typically strong stop + strong fricative, cf. *pʰr̥ɨx* ‘skiing on snow’, or strong stop + labial fricative, cf. *qʰva qʰva* ‘seething water’. Final clusters vary widely, cf. *ŋutr ŋutr* ‘bear growling’, *kʰulx kʰulx* ‘falling objects’. Biphonemic vowel clusters are rare, cf. *ke.ar ke.ar* ‘wood creaking’. Polysyllabic forms exist but are uncommon, cf. *kiɟre kiɟre* ‘snake hissing’, *qalʁalχ qalʁalχ* ‘goose crying’.

Nivkh onomatopoeia primarily depict natural sounds, with water-related noises forming the largest category, cf. *pulx pulx* ‘boiling water’, *kʰudr kʰudr* ‘snow creaking’. Animal and bird calls are also well represented, cf. *keχ keχ* ‘squealing’, *ŋudr ŋudr* ‘dog growling’. Human sounds are divided into vocalizations, cf. *pʰe pʰe* ‘sniffling’, *peax peax* ‘whistling’, and bodily noises, cf. *kavr kavr* ‘chewing’, *tʰarf tʰarf* ‘stomping’. Another major class imitates sounds from objects like wood, metal, and fabric, cf. *kʰalaŋ kʰalaŋ* ‘rattling buckets’, *cʰeχ cʰeχ* ‘clanging metal’, *keɟre keɟre* ‘fabric tearing’. More examples and further description of Nivkh onomatopoeia can be found in (Panfilov 1965; Gruzdeva 2024a).

From a cross-linguistic perspective, Nivkh onomatopoeia follows recurrent patterns of imitative iconicity, particularly in three distinct semantic domains.

The first group of onomatopoeic expressions consists of words that imitate the sounds of water. These words typically begin with a strong palatal stop and contain a low vowel and a lateral liquid – features that are cross-linguistically common in water-related onomatopoeia. Examples include *cʰval cʰvalχ, cʰall cʰall* ‘splashing of water’, *cʰal cʰal, cʰalf cʰalvs* ‘falling of water drops’, *cʰoplχ cʰoplχ* ‘sound of fish caught in the net’, and *cʰalf cʰalf* ‘sound of bear walking in shallow water’. Some imitative words do not contain a liquid, but only a low vowel, cf. *cʰapaχ cʰapaχ* ‘catching fish’, or a lateral, cf. *cʰelf* ‘water sloshing underfoot’, *pulx pulx, qol qol* ‘boiling water’, *ful ful* ‘bubbling water’.

The association of low vowels and lateral liquids with fluidity and liquidity aligns with sound symbolism theory (Hinton et al. 1994), which posits that certain phonemes evoke sensory experiences across languages. Similar patterns are observed in Japanese mimetics (Hamano 1998). Lateral sounds, which may occur as fricatives, approximants, or vibrants, have been grouped under the feature [lat]eral due to their distinctive articulation – where the airstream flows along the sides of the tongue rather than through the center of the mouth. Previous research (Blasi et al. 2016; Thompson & Do 2019) has linked lateral consonants to notions of smoothness, liquidness, and even the tongue itself, further supporting their role in water-related sound symbolism.

The second group of relevant onomatopoeic expressions in Nivkh consists of words that imitate creaking and crunching sounds. These words typically contain a trill and often begin with a velar or post-velar stop. Examples include *kaur kaur* ‘creaking of snow underfoot’, cf. *kʰudr kʰudr* ‘creaking of snow under the sled’, *kear kear* ‘creaking of wood’, *keɣre keɣre* ‘door creaking’, *kavr kavr* ‘crunching when chewing food’, *qawr qawr* ‘crunching of snow’, *odr odr* ‘creaking of a swaying tree’.

The presence of trills and velar/post-velar stops in words describing creaking and crunching is naturally not unique to Nivkh. Dingemanse (2011) notes that trills frequently

mimic rough or vibrating textures in ideophones, while Ohala (1994) argues that trills and fricatives are well-suited for representing rough, irregular, and creaky sounds. Additionally, velars are often linked to meanings such as 'hard' and 'bent' (Wichmann et al. 2010), reinforcing their association with resistance and friction. More broadly, vibrants are commonly perceived as symbolizing roughness, instability, and rolling movements across languages (Fónagy 1963). Similar patterns can be observed in German, Spanish, and Basque, where trills and velars frequently appear in words that evoke rough, resonant, or creaking sounds.

The third group is formed by onomatopoeias referring to the sounds of signalling equipment, which begin with the voiced stops, cf. *durin durin* 'dinging', *goŋ goŋ* 'bell ringing'. As has been noted in Section 1, in Nivkh voiced stops are phonologically a very marginal group, and onomatopoeic words represent a rare case of their use in the initial position of a word.

Voiced stops are often associated with largeness, following a cross-linguistic tendency to associate this meaning with phonetic segments of low acoustic frequency (Ohala 1994: 335). They give a sense of intensity (see Section 3.3), resonance and impact, making them suited to describing mechanical or metallic sounds. Examples can be found from English, Chinese, and Russian.

Many words in Nivkh basic vocabulary also reflect iconic relationships between form and meaning, cf. the discussion of primarily onomatopoeic mappings in (Johansson et al. 2020: 289-290) and sound-meaning associations in the basic vocabulary in (Blasi et al. 2016). These words include the semantically related nouns *tʰuɣr* 'fire' and *tʰuf* 'smoke' and the corresponding verbs *fu-* < **i-pʰu-* 'make a fire', *tʰum-* 'heat up', and *fuv-* < **i-pʰuv-* 'blow', coming back to the onomatopoeia *pʰu pʰu* 'blowing the fire'. All these words contain the vowel *u* and some of them (historically) begin with a labial stop.

A cross-linguistically broader pattern emerges when considering concepts related to 'blow', all involving the movement of air or fine particles. Phonetically, these words frequently feature the rounded back vowel *u* and voiceless labial consonants, particularly *p*. This suggests that airflow-related words may be onomatopoeically grounded in the articulatory properties of labial sounds, where lip rounding regulates airflow, enhancing both acoustic and tactile friction (Johansson et al. 2020: 289).

The nouns *qorqr* 'throat' and *qʰos* 'neck' illustrate iconicity in pharyngeal-related words. In many languages, concepts like 'throat' are linked to round and back phonetic features, with *o* as the dominant vowel. Additionally, it is associated with voiceless velar/post-velar stop such as *k*. This suggests that pharyngeal-related words are characterized by sounds produced at the back of the oral cavity, possibly with a more open mouth than in airflow-related terms (Johansson et al. 2020: 289).

Other possibly iconic words in the Nivkh basic vocabulary include *cʰaχ* 'water' (see the water-related onomatopoeia discussed above), *hilx* 'tongue', *lɨx* 'rain', *la* 'wave, wind' (all three containing the lateral liquid cross-linguistically associated with liquids), *pʰeŋr̥* 'fly' (from *pʰeŋ pʰeŋ* 'fly squawking'), *pol-* 'fall' (from *pol vol* 'movement of a rolling object), *momo-* 'suck', *ɲeɲe-* 'be sweet', *mama-* 'crush' (all three derived from the ideophones with the corresponding meanings).

A large group of verbs are derived from onomatopoeic words by suffixation and / or by synthesis and conversion, cf. *qʰadr qʰadr* 'heavy scratching' > *qʰadr-ju-* 'scratch on sth.', *qʰadr~qʰadr-* 'scratch'; *qʰaf qʰaf* 'chattering' > *qʰaf~qʰav-jo-* 'chatter'.

Conclusion

The study of iconicity in Nivkh reveals the extensive role of sound-meaning correspondences in the language's phonological and morphological systems. Nivkh demonstrates all basic types of iconic associations found across languages. Each type of iconicity – gestalt, relative, and imitative – contributes uniquely to the structure and expressiveness of Nivkh vocabulary.

Gestalt iconicity manifests primarily through reduplication, which structurally mirrors real-world concepts such as repetition, plurality, and intensity. This feature plays a central role in Nivkh grammar, highlighting how linguistic structures can reflect perceptual and conceptual properties of events. The linking of speech sounds with sensory and conceptual properties through motoric gestures is particularly evident in Nivkh ideophones, where different phonetic features create mappings between articulation and meaning.

Relative iconicity operates through systematic phonetic contrasts, such as vowel lengthening, vowel raising, and consonant voicing, encoding nuanced semantic distinctions in a non-arbitrary manner. This demonstrates how iconicity functions beyond direct imitation, establishing structured relationships between phonetic form and meaning.

Finally, imitative iconicity, exemplified by onomatopoeia, provides the most direct form of sound-symbolic correspondence, with words mimicking natural sounds establishing a tangible link between linguistic form and environmental stimuli.

Taken together, these layers of iconicity demonstrate that Nivkh is a language where phonetic structure is deeply intertwined with meaning, reinforcing the idea that iconicity is not an isolated phenomenon but an integral part of linguistic organization. By examining the various types of iconicity in Nivkh, this study contributes to a broader understanding of how languages use phonetic features to encode meaning in systematic and perceptually motivated ways. This highlights the essential role of iconicity in human language while emphasizing the distinct ways in which different languages employ it.

Abbreviations

ABL	ablative	EXPR	expressive
AUG	augmentative	FUT	future
CATEG	categorical	HORT	hortative
COM	comitative	IND	indicative
COMPL	completive	ITER	iterative
COORD	coordinated	LOC	locative
CVB	converb	NEG	negative
CVB.ANT/SIM	converb: anterior/simultaneous	NMLZ	nominalizer
CVB.BSIM	converb: bounded simultaneous	PERM	permanent
CVB.DIST	converb: distal	PL	plural
CVB.NAR	converb: narrative	Q	question
CVB.UBSIM	converb: unbounded simultaneous	RED	reduplication
DAT	dative	REFL	reflexive
DES	desiderative	SG	singular
EXCL	exclusive	VOC	vocative

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Gizey onomatopoeias

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This paper offers a first overview of onomatopoeias in Gizey, a languoid of the Masa branch of Chadic (Afroasiatic). Onomatopoeias are classified as a subset of ideophones, which include words, irrespective of word class (nouns, interjections, and adverbs), that depict sensory experiences. Like other ideophones, onomatopoeias show very little "deviant" phonology, and do not take part in any inflectional or derivational morphological operations. A remarkable feature of Gizey onomatopoeias is the prevalence of the CiC (Consonant-vowel /i/-Consonant) root structure. However, there does not appear to be any transparent CiC-meaning association. Tentatively, we argue that the CiC pattern is merely a morphological niche from which new onomatopoeias are modelled. Finally, we highlight other more potentially serious instances of sound symbolism in Gizey onomatopoeias.

***Keywords**: onomatopoeia*, *ideophone*, *sound symbolism*, *morphological niche*

Introduction

This paper offers the first overview of onomatopoeias in Gizey. Gizey is a Masa languoid (Glottocode: *gize1234*) spoken in Cameroon and Chad by 12,000-19,000 speakers (see, e.g., Gaffuri, Melis & Petrarca 2014; Seignobos & Iyebi-Mandjek 2000). Onomatopoeias and sound symbolism, the main topics of this special issue, are both very marginal topics in the study of Masa languages. Generally, onomatopoeias are mentioned only in passing when discussing ideophones (e.g., Guitang, in preparation).

In the relevant literature, onomatopoeias are traditionally viewed as a subclass of ideophones (see, e.g., the classification of sound imitations as "ideophones" in Ajello & Melis 2008), whereas ideophones are considered a distinct part of speech in some research.[17]

As for sound symbolism, it is even less researched in Gizey. Despite this, a few examples of different kinds of sound-meaning mappings can be found in the relevant literature (on ideophones). For example, Guitang (in preparation) discusses the diagrammatic mapping ("*gestalt*" iconicity) between initial glottal stops and activities that normally require a contraction of the abdomen in Gizey verbs like *ʔɔ́ɬ* 'cough', *ʔɔ́k* 'excrete', and *ʔɛ́ɬ* 'lay (eggs)'. Also, Roberts & Soulokadi (2019) point to a probable instantiation of relative iconicity in forms like those listed in Table 1.

The term "*relative iconicity*" captures those cases "where related forms are associated with related meanings, as when a contrast between the vowels [i:]/[a] depicts an analogous contrast in magnitude" (Lockwood & Dingemanse 2015: 3).

Apart from these few registered cases, we know very little about iconicity and sound symbolism in the Masa languages. This contribution is also unlikely to revolutionize our understanding of iconicity in Gizey. This paper mainly documents some of the observations we have made on a very limited dataset. The discussion which follows is mainly based on (a)

[17] In the Masa literature, ideophones are generally assumed to form a distinct word class (part of speech) (see, e.g., Ajello & Melis 2008; Roberts & Soulokadi 2019). In Gizey, Guitang (in preparation) has argued that ideophones do not form a distinct word class.

secondary lexical data retrieved from Ajello & Melis (2008), (b) folktales collected in 2019 by the first author, and (c) on lexical data collected via *WhatsApp* in 2023.

Table 1: Relative iconicity in Musey[18]

fēērēērēē	describes the smallness of a hole	#	*fūūrūūrūū*	describes the thickness of a hole
bìlìgdìg	describes a swollen state	#	*bòlògdòg*	describes something tick or big
mbàgàggàg	describes the whiteness of flour	#	*mbìgìggìg*	describes the whiteness of color

The dataset includes 105 onomatopoeias that distribute across four semantic categories defined according to the sources of sound: 'elements', 'animals', 'human', and 'artifacts'. The majority of the studied Gizey onomatopoeias fall into the semantic categories 'elements' and 'animals'. The first group (sound source – 'elements') contains 33 onomatopoeias, 16 of which describe water-related sounds, seven are related to 'air', six concern 'fire', while only four are about 'earth'. The second group ('animal sounds') contains 33 onomatopoeias for the sounds of birds, animals, insects, reptiles/amphibians, and fish. In fact, as many as 19 descriptions of bird sounds are attested in contrast to 7 mammal sounds, 3 sounds of reptiles/amphibians, 3 insect sounds, and only 1 fish sound. There are 27 imitations of 'human' sounds (21 depicting 'bodily' sounds and 6 sounds for various types of voice). The group 'artifact sounds' is the one with the fewest number of onomatopoeias. There are 6 words depicting sounds of musical instruments and another 6 – instruments of war and destruction.

The article is organised in the following way: Section 1 gives a phonological background of Gizey, including consonant, vowel and tone inventories. Section 3 discusses the place of onomatopoeias in the grammar of Gizey and highlights the main features of onomatopoeias. Section 3 discusses the *CiC* onomatopoeia model. We suggest that *CiC* is a preferred model for the formation of new onomatopoeias. Section 5 presents a few cases of sound symbolic patterns, and exceptions to the observations made, and Section 6 concludes the paper.

1. Phonology of Gizey

Given the focus of this volume on sound symbolism, a presentation of the phonology of the studied languoid language is necessary.

1.1 Consonants and vowels

The consonant and vowel inventories of Gizey are provided in Tables 2 and 3. Segments in bold (ʧ and ʤ) in the consonant chart are those absent from our onomatopoeia dataset. The sound /i/ tends to be overrepresented in onomatopoeias. We will return to this specific point later in Section 3.

[18] Musey is also a Masa language (like Gizey) with Glottocode: *muse1242* (see classifications by Melis 2019; Newman 2013).

Table 2: Gizey consonants

	Bilabials		Labio-dentals		Alveolars		Post-alveolars		Velars		Glottals	
Plosives	p	b			t	d			k	g	ʔ	
Affricates							**ʧ**	**ʤ**				
Implosives	ɓ					ɗ						
Nasals		m				n				ŋ		
Trills						r						
Fricatives			f	v	s	z					h	ɦ
Lateral fricatives					ɬ	ɮ						
Approximants								j		w		
Lateral approximants						l						

Table 3 represents Gizey vowels.

Table 3: Gizey vowels

	front		back
close	i		u
open-mid	ɛ		ɔ
open		a	

Additionally, one can find extremely marginal consonants, e.g., /ɲ/ and /ɾ/ and vowels, e.g., /œ/ shown in the onomatopoeias in (1).

(1) *ɲìgí* ‘guinea fowl call’
pɾɛ́k ‘lightning sound’
ʔœ́ːk ‘frog call’

Gizey provides some support for the claim that “languages typically exploit sounds not part of the regular phonemic inventory for expressive purposes” (Childs 1988: 170). The occurrence of such sounds seems to be predicted by the fact that the imitation of new auditory experiences may involve hitherto unused sound production mechanisms. The resulting sound segment may then be integrated or not in the phonological inventory. At this stage, the segments /ɲ/, /ɾ/, and /œ/ remain marginal elsewhere too and they are not included in the phonological inventory of Gizey (see De Dominicis’ (2008) phonological sketch).

Contiguous vowels are attested in Gizey, e.g., *bùú* ‘bag’. However, these are ambiguous between being inherently long (*bŭː*) or involving two nuclei (*bù.ú*) (see De Dominicis 2008: 3–5). Guitang (2024) has tentatively suggested that contiguous vowels shall be considered to possess two vocalic nuclei.

Ideophonic (and, therefore, onomatopoeic) word-forms with long vowels tend to exhibit iconic properties. For example, the bleating of sheep and goats is imitated by onomatopoeic words having long vowels: *màà* ‘baa’ (sheep) and *méé* ‘baa’ goat; and the VV sequence imitates

the bleat, which is inherently long. Generally, forms like *màà* ‘baa’ (sheep) and *méé* ‘baa’ goat are produced with extra lengthening (as long as the speaker can sustain) to mirror the duration of the depicted natural sound.

2.2 Tones in Gizey

In Gizey, words tend to be lexically specified with different tonal schemes. For example, nouns generally select between Low-Low, Low-High, High-Low, and Low-High-Low tonal schemes (Guitang 2024). Onomatopoeias generally select between High, e.g., *ɓát* ‘sound when wood breaks’, *ɓétɓét* ‘sound when someone walks’, *ʧíŋʧíŋʧíŋ* ‘southern red bishop call’ and Low, e.g., *dìm* ‘sound of a big and heavy object thrown in water’, *gìndìm* ‘sound of a loud gun’. A Low-High scheme is found on a few onomatopoeias, e.g., *ɲìgí* ‘guinea fowl call’.

2.3 Syllable structure

The dominant syllable structure in Gizey is CVC. This is also the case in onomatopoeias. Roots tend to be maximally disyllabic, and there is a remarkable propensity for monovocalicity. The syllable pattern *CiC*, to be discussed in detail in Section 3, is the dominant model in onomatopoeias. Onomatopoeias with more than two syllables generally involve reduplication.

2. Onomatopoeia in Gizey grammar

In descriptions of Gizey, onomatopoeias tend to be classified as a subset of ideophones. And Guitang (in preparation) has argued that ideophones do not constitute a distinct word class (part of speech) in Gizey. A prediction to be made from Guitang’s analysis (in preparation) is that onomatopoeias can belong to different parts of speech, like other kinds of ideophones, i.e., *psychomimes* and *phenomimes*. *Psychomimes* and *phenomimes* depict psychological states and perceptions of the external world (non-auditory), respectively (see e.g., Croft 2022; Kanero et al. 2014). At this stage, however, we find that onomatopoeias belong to either of the the word classes of nouns, interjections, or adverbs. Onomatopoeias that belong to nouns include the forms in (2).

(2) *méé* ‘goat’
bùtùktúk ‘senegal coucal’
ʧɛ́r ‘yellow-billed oxpecker’
gùlɔ́k ‘cock’

Generally, onomatopoeic nouns refer to animals, and their forms are to be interpreted as derived from imitations of the sounds made by these animals. Gizey onomatopoeic nouns are derived from interjections (Guitang 2024), as testified in Table 4 which shows the nouns in (2) together with the interjections from which they are converted.

Table 4: Animal cries (interjections) and related nouns in Gizey

Animal cries (interjections)	**Related nouns**
méé 'baa'	*méé* 'goat' (also *ɦù méé* 'caprine baa')
bùdùdù 'call of the Senegal coucal'	*bùtùktúk* 'senegal coucal'
ʧér 'call of the yellow-billed oxpecker'	*ʧér* 'yellow-billed oxpecker'
kógɔ̀lɔ̀k 'cock crow'	*gùlɔ́k* 'cock'

In Gizey, interjections are defined as a class of words that are autonomous and lack inflectional or derivational morphology. Members of this class "express a speaker's mental state, action or attitude or reaction to a situation" (Ameka 1992: 106). Not all animal related interjections have associated nouns. For example, the interjections in (3) do not have corresponding nouns in Gizey.

(3)	*mɔ́ɔ́*	'moo' (cow mooing)	> *pút* 'cow'
	màà	'baa' (sheep bleat)	> *dìmìj* 'sheep'
	híígím híík	'hee-haw' (donkey braying)	> *bèlhè* 'donkey'
	hèhèhè	'neigh' (horse whinny)	> *kūlūm* 'horse'

Examples below show the onomatopoeic interjections (4) *màà* 'baa' (sheep bleat) and (5) *méé* 'baa' (goat bleat) in actual use. Example (5) also includes the onomatopoeic noun *méé* 'goat' to be contrasted with the interjection. The nominal form functions as the subject and can host an enclitic determiner in that function just like other nouns.

(4)

dìmìì=d	màà	gɔ̀r	màndá	kàl=ɛ̀j	t=àj	hàt	ɦùn=ìjá
sheep=DET	baa	child	mine	leave=1PINCL	eat=1PINCL	hay	mouth=1PINCL

'sheep went: "baa. My child, let's go eat some hay"'.

(5)

méɛ́=t	méé	ʤùv=ún	ʧùk=ŋà	méɛ́	ʤùv=ún	ʧùk=ŋà
goat=DET	baa	husband=1S	dressing=DET	baa	husband=1S	dressing=DET

'Goat went: "baa. My husband the dressing. My husband the dressing."'
(who dresses elegantly)

In (4) and (5), the onomatopoeic interjections *màà* and *méé* occur in quotational constructions that lack a clear matrix clause and a quotative marker. Such constructions are commonplace in Gizey. In quotational constructions, the animal cries above (onomatopoeic interjections) are to be regarded as demonstrations. Demonstrations are iconic communication acts that enable an addressee to experience aspects of the speech of the reported speaker (see Clark & Gerrig 1990). Example (6) shows the onomatopoeic adverb *típ*, which describes sounds produced by two bodies coming into sudden contact.

(6)

kūlūm=bī	ʧī	gìj=àʔ	típ
horse=DET	hit.PST	foot=3SF	ONOM

'Horse hit her foot *tip*.'

Onomatopoeic adverbs are integrated syntactically as evidenced in (6) where the phonological word *gìjàʔ* 'her foot' that precedes the onomatopoeic adverb *típ* does not host a final vowel. Like other Chadic languages, Gizey has parsing morphology, *viz*. morphological marking that shows how speakers parse syntactic structures (see Shay 2020; Frajzyngier 2016). Specifically, certain constituents bear a final vowel when they occur at the right edge of sentences. For example, in (7) below, the generic noun phrase *nìj* 'water' hosts a suffixal final vowel -ɔ. Compare (7) with (8) in which *nìj* 'water' is not the final element of the sentence.

(7) ʔàn ɣĩ nìj-ɔ́
1S drink.IPFV water-FV
'I (will) drink water'.

(8) ʔàn ɣĩ *nìj-ɔ́/nìj dĩ
1S drink.IPFV water-FV NEG
'I (will not) don't drink water'.

Thus, the presence or absence of a final vowel on the preceding word is a test we use to decide whether a target word is integrated syntactically or not. Generally, onomatopoeic ideophones (phonomimes) [19] are more integrated than other subsets (phenomimes and psychomimes).

Regarding semantics, the data assembled so far does not provide sufficient evidence to illustrate clear semantic relationships between onomatopoeias. However, the possibility to use more than one form for a sound from a single source is observed, e.g., *bìkbìk / bìŋ / vìkvìkvìk* which all describe the sound made when someone is running. It is possible that subtle differences between the three forms might relate to the manner or intensity of the running, a separate form, *fágá* is used specifically if the running is quite fast. Another group of onomatopoeias that describe sound(s) from a single source is *gúkgùlìj / gúúkgúú / krúkúdúk / ɦùgī ɦù* 'pigeon call' although it remains unclear what semantic details, if any, are encoded by each form.

Other onomatopoeias that appear to be synonymous signal differences in manner or intensity of the sound. Thus, three different forms describe the sound from guns, namely, *búm* used for the sound of guns generally, *gìndìm* for the sound of a loud gun, and *gùrùm* for the sound of a particular kind of gun (gurlum). The same can be said about the sound produced by drops which is *títtílí* from a heavy 3-leg drum but *dìldìl* from a double-skin drum.

Onomatopoeias do not seem to exhibit polysemy. One onomatopoeia with two slightly different meanings is *dìm* which depicts the sound of something big and heavy thrown into water or the sound of someone diving in water'. Another onomatopoeia *wííwíí* describes both the sound of mosquitoes and that of wasps.[20] Since both onomatopoeias describe the same sound resulting from different source objects, we do not consider them to be polysemous (see Akumbu 2024: 113 for a similar relationship in Babanki, a Grassfields language of Cameroon).

[19] The term *phonomimes*, mostly used in the study of mimetics in Japanese, is another term for words that imitate actual sounds (see, e.g., Akita 2009; Kanero et al. 2014)

[20] Interestingly, the sound of flies is described by a different form *wìwìwì* with L tone, indicating that insects do not have a single lexeme for their sounds.

3. The *CiC* root model of Gizey onomatopoeias

As indicated above, the dominant structural model in Gizey onomatopoeia is *CiC*, i.e., a sequence of a Consonant, the vowel /i/, and another Consonant, illustrated by the following examples (9).

(9) dìm ‘sound of heavy object thrown in water’
dǐt ‘sound of violent hit’
dìt ‘final sound of noisy process’

The suggestion that the *CiC* model is dominant could be explained by the fact that *CVC* is the preferred syllable structure in Gizey (see Guitang 2024). However, the question why /i/ is the preferred vowel, is the one we do not have a clear answer to yet. It is possible that the acoustic nature of the imitated sound could be responsible. Nevertheless, the existence of forms which describe similar sounds but contain different vowels suggests that the vowel of an onomatopoeia does not depend entirely on the imitated sound, e.g., *dìm* ‘sound of heavy object thrown in water’ and *brùm* ‘sound of something big and heavy that falls in water’.

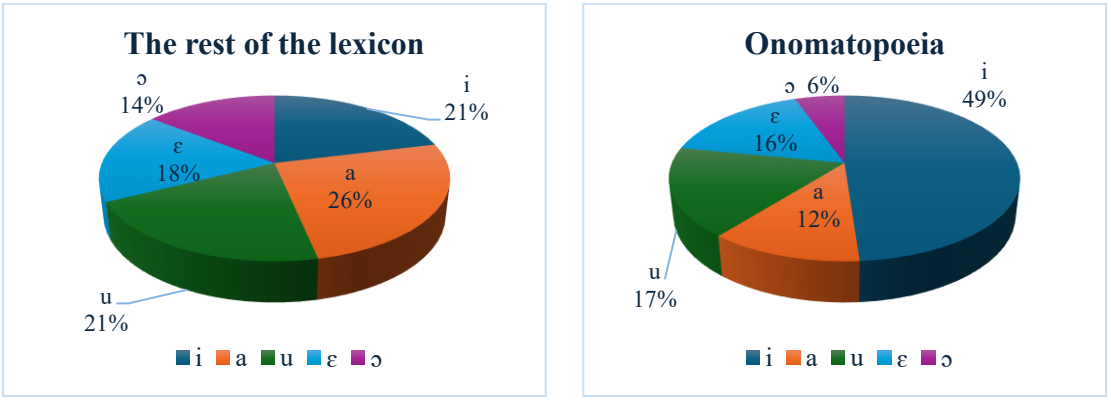

Figure 1: Distribution of Gizey vowels in the lexicon (left) and in onomatopoeias (right)

In the Gizey lexicon, /i/ also stands as one of the most utilized vowels as shown by the comparative data in Figure 1. While these distributional data could explain why /i/ is overrepresented in onomatopoeias, they do not explain why, for example, /a/ or /u/ are not selected as the preferred vowels. Our best guess at this stage is that *CiC* is merely a morphological niche from which new onomatopoeic forms are modelled, under analogy. This could explain why we do not find any transparent *CiC*-meaning association.

4. Sound symbolism in onomatopoeia

The question to be addressed in this section is whether in addition to their being instantiations of direct iconicity (imitating sounds in the real world), Gizey onomatopoeias include sounds or sound sequences that are associated with specific (non-acoustic) meanings. We found only few and probably disputable cases of sound symbolism which are discussed below. The reader,

however, is guarded against drawing any final conclusions about Gizey onomatopoeia based on the data presented in this section as our dataset is but limited. Below, we present our preliminary observations and provide counterexamples.

The first case to be discussed is the connection between /w/ and FLYING or AIR, as can be seen in the following examples.

(10) *vìw* ‘sound of fire in windy situation’
wíí wíí ‘sound of flying mosquito or wasp’
wì wì wì ‘sound of flying fly’
kíwíwwíw ‘sound of a thrown knife’

However, /w/ is also attested in other onomatopoeias that have no connection with FLYING or AIR, the following examples illustrate.

(11) *néw néw néw* ‘cry of the white-faced whistling duck’
kírìw ‘sound of a knife being sharpened’

Note that in (10) we have a potentially meaningful tonal contrast between *wíí wíí* ‘sound of flying mosquito or wasp’ and *wì wì wì* ‘sound of flying fly’, i.e., between H and L depending on the insect whose flying is depicted. Such tonal contrasts can be seen also in forms like *búm* ‘gunshot sound’ and *bùm* ‘sound when burning a wet object’. Again, the data are insufficient and the minimal pairs quite few to all us to draw any meaningful conclusions.

The second case concerns coda trills. They generally describe extended or prolonged sound events, such as the following.

(12) *ʤèr* ‘sound of oil while frying’
ʧɛ̀r ‘cry of the yellow-billed oxpecker’

However, we also find forms like *tír* ‘sound of a yank’, not depicting an extended or prolonged sound-event.

It is worth noting that final /r/ is frequently lengthened iconically to mirror intensity or duration of a sound-event. For example, the final /r/ of *ʧɛ̀rrr* ‘cry of the yellow-billed oxpecker’ could be lengthened (as long as the speaker can sustain) to mirror the length of the depicted event. Note also that the sounds produced by animals often come repeated in discourse, e.g., *kèkèrék kèkèrék* ‘guinea fowl cry’, for the same expressive reasons as final /r/ lengthening.

The third case relates to final /m/ and its connection to LOUD sound, illustrated by the following examples.

(13) *dìm* ‘sound of something big and heavy thrown in water’
brùm ‘sound of something big and heavy that falls in water’
ʤùm ‘sound when someone dives in water’
búm ‘gunshot sound’
gùrùm ‘sound of the gurlum’ (a kind of a gun)

Finally, some onomatopoeic forms include final syllable reduplication. This reduplication process is frozen, *viz*. reduplication is part of the lexical form (see, e.g., Newman 2000).

(14) *dìgìŋ-gìŋ* ‘landing sound’
bìgìm-gìm ‘loud water sound’

Elsewhere in Gizey and in other Masa languages, final syllable doubling is generally associated with length, straightness, and large quantity (Guitang 2022). Examples of nouns with this pattern are given in (15). Note, however, that it is not entirely clear how onomatopoeic forms like *dìgìŋ-gìŋ* and *bìgìm-gìm* fit into this picture.

(15) *dùmúl-múl* ‘kind of snake’
ʤùkúl-kúl ‘hoopoe’
ʧîkíl-kíl ‘*Elapsoidea guntheri*’
tùgùl-gúl ‘variable cat snake’
dùwér-wér ‘part of the intestine’

Conclusion

This study has examined the properties of Gizey onomatopoeias, i.e., words that specifically imitate the sound associated with a certain source. It first presented the information about the morpho-phonology of the language relevant to the understanding of onomatopoeia. Later, the discussion proceeded to the major characteristics of onomatopoeia in the grammar of Gizey. We suggested that the *CiC* root structure, the dominant structural model in Gizey onomatopoeia, is merely a morphological niche from which new onomatopoeic forms are modelled analogically. Finally, we examined sounds and sound sequences that appear in Gizey onomatopoeic words and concluded that they can associated with specific meanings.

However, the limited amount of the analysed data is not sufficient enough to reveal complex sound symbolic relations in Gizey. This study is the first to focus on onomatopoeia in Gizey and we hope that that it will encourage research on this set of words both in Gizey and in Masa languages more generally.

Abbreviations

1PINCL	first person plural inclusive	IPFV	imperfective
1S	first person singular	NEG	negation
3SF	third person singular feminine	ONOM	onomatopoeia
DET	determiner	PST	past
FV	final vowel		

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Appendix: Gizey onomatopoeias

	SOUND TYPES		ONOMATOPOEIA	MEANING
NATURAL SOUNDS	4 ELEMENTS	WATER	*ʤùm*	when someone dives in water
			píw	water dripping
			brùm	big and heavy object that falls into water
			ʧilʧil	when the african arowana jumps in water
			bìgímgím	loud water sound
			fìì	when rain just begins to fall
			fɨ̀ɨ	heavy rain with very wet soil
			vìkvìk/víŋvíŋ	river flowing
			bìdìt	loud rain sound
			béŋ	light rain sound
			tìt	liquid dripping
			dìm	big and heavy object thrown into water, or someone diving
			rìʧít	heavy rain
			kɔ̀ɔ̀t	water flowing
			bítítbítít	when swallowing water
		AIR	*bìk*	strong and dusty wind
			sèŋ	slow wind
			gìbìwbìwbìw	sound of thunder
			dìt	final sound of noisy process
			ɮìk	regular and continuous sound
			kìjt/fijt	tearing sound
		EARTH	*ɓát*	breaking wood
			blúk	stone crashing
			drìk	object bouncing
			dìgìŋgìŋ	object landing
		FIRE	*bùm*	wet object burning
			prékprék	lightening
			vìw	fire in windy situation
			vìk	vapor sound
			ʤèr	frying in oil
			rìʧítʧít	grass burning
	ANIMALS	MAMMALS	*ʔáwʔáw*	dog bark
			hájn hájn	dog cry
			màà	baa (sheep)
			mɔ́ɔ́	cow moo
			méé	baa (goat)
			hììgímhììk	donkey call
			hèhèhè	horse neigh
		BIRDS	*ʧíŋʧíŋʧíŋ*	southern red bishop call
			gɔ̀kgɔ̀lɔ̀k	cock crow
			krúkrúk	hen cackle
			kjúrrkjúrr	chestnut-bellied starling call

			kyúkyúk/ɲìgī	guinea fowl call
			ʧér	yellow-billed oxpecker call
			ʤɔ̀ɔ̀ʤɔ̀ɔ̀	baya weaver call
			bùdùdù	senegal coucal call
			néwnéwnéw	white-faced whistling duck call
			krέwkrέw	sparrowhawk call
			kílíkílí	rose-ringed parakeet call
			kákáráw	francolin call
			gáákgáák	heron call
			gúkgùlìj, gúúkgúú, krúkúdúk, ɦùgī ɦù	pigeon call
		REPTILES AND AMPHIBIAS	*kέkέkέ*	rufous beaked snake
			ʔœœk	frog cry
			ʔɔ́ɔ́kŋ́	toad cry
		INSECTS	*wìwìwì*	fly hiss
			wííwíí	wasp hiss
			wííwíí	mosquito
		FISH / SEA CREATURES	*ʧûkʧûk*	catfish sound
	human	VOICE	*jé/jájóó/wū*	crying sound
			ʔɨhèʔ	laughter sound
			ʔùhɔ̀ʔ	coughing sound
			kùj	sound of loud shout
		BODY	*ɓέtɓέt*	walking sound
			táltál	hand clapping sound
			sáát	walking on dry ground sound
			mìrmìr	walking on wet ground sound
			brít/ʧídìt	pooing sound
			tàl	sound made by the toasting tongue
			kàmʧà	chewing sound
			hìlīk	wet vagina sound
			gìf gìf	heart beating
			ʔááʔáá	breathing heavily
			kíwíɬ	bone cracking sound
			tír	sound of a yank
			dít/dì/gìm/típ	sound of a blow
			fágá	rapid running sound
			bìkbìk/bìŋ/vìkvìkvìk	running sound
artifacts	MUSICAL INSTRUMENTS		*kìʧέ*	rattle
			títtílí	heavy 3-leg drum
			képlέʔèm	calabash
			télét	flute
	INSTRUMENTS OF WAR AND DESTRUCTION		*kírìw*	sharpening knife
			búm/tíl	sound of a gun
			gùrùm	sound of the gurlum (gun)
			gìndìm	sound of a loud gun
			kíwíwwíw	thrown knife sound

	MECHANICAL EQUIPMENT AND DEVICES	*tùdùttùdùt*	kind of aerophone

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Animal-oriented interjections in the languages of the Iberian Peninsula

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In different languages we find special words used to call, scare away or direct animals. For example, in English, Whoa!, Ho! are used to stop horses, in Spanish ¡Sooo! is used in the same way. Some of these words are derived from onomatopoeias and can be subjected to a sound symbolic analysis. In this paper, they will be referred to as Animal-Oriented Interjections (AOI). I will propose a typology of AOIs in the languages of the Iberian Peninsula (IP) based on two factors: the animal species addressed and the type of action commanded. In addition, I will discuss AOIs having a trilled consonant in the IP languages. Some of the acoustic and articulatory features of trills can be interpreted iconically in different languages, and I will show that this is precisely the case in some of the AOIs of the IP languages. Moreover, it will be shown that the most general words denoting dog in both Spanish and Catalan come from two different AOIs directed to dogs. I will offer a description of the necessary steps leading to this result in the last section of this paper.

Keywords*: onomatopoeia, iconicity, interjections, phonosymbolism, semiotics*

1. Animal-oriented interjections

In many languages there are special words used to call, scare away or direct domestic animals, often heard in both rural and urban areas. For instance, in English, *Ho!,* or *Whoa!* are employed to stop horses, in Spanish *¡Sooo!* is used in the same way. In English, *gee* is uttered as a command to a horse or other draft animal directing it to turn right and *Gee up!* is an expression of command to a horse or other draft animal directing it to go faster; in Spanish, the corresponding word is *Arre!* Some of these words are based on onomatopoeias and can show sound symbolism. They are called *huchements* in French (Enckell & Rézeau 2003: 14) and these animal calls are usually considered to be interjections. Meinard (2015: 153) claims that animal calls cannot be classified as interjections for two reasons: they are addressed to animals, and they are almost equivalent to vocatives. Both objections are based on the pragmatic use of these expressions, but not on their intrinsic nature. But animal calls, like interjections, are not random sounds produced by human vocal organs nor are they mere imitations[21], since they use speech sounds, are based on linguistic conventions, and, as in the case of interjections, can be transformed into regular words, as we will see in this paper.

These expressions are categorized by Enfield (2007) as animal-oriented interjections (AOIs). To adopt this terminology, Ameka's distinction between primary and secondary interjections must be taken into account:

> For a proper understanding of the phenomenon of interjections in the languages of the world, it seems useful to distinguish between those words that are primary interjections, that is, they are not used otherwise; and other words which come to be used as interjections by virtue of their notional semantics. These may be considered secondary

[21] Bynon (1976: 41) says that interactions with wild animals involve non-linguistic imitations of naturally occurring animal sounds. In contrast, animal calls use only speech sounds.

> interjections. The implication of this view is that secondary interjections are forms that belong to other word classes based on their semantics and are interjections only because they can occur by themselves non-elliptically as one-word utterances and in this usage refer to mental acts.
>
> (Ameka 1992: 105)

Primary interjections are defined by Ameka as follows:

> […] little words or non-words which in terms of their distribution can constitute an utterance by themselves and do not normally enter into construction with other word classes, for example, *Ouch!*, *Wow!*, *Gee!, Oho*!, *Oops*!, etc.
>
> (Ameka 1992: 105)

Expressions such as *Whoa!* or *Gee!* can be considered primary interjections because they are used exclusively to command animals and are not ordinary nouns or verbs. With regard to their function, Ameka (1992) proposes the following types of interjections on the basis of their communicative function[22]:

(1) Types of interjections in Ameka (1992)
   a. *Expressive* (symptoms of the speaker's mental, emotional states):
      (i) Emotive, e.g., *Yuk*! (Disgust), *Wow*! (Surprise), *Ouch*! (Pain)
      (ii) Cognitive, e.g., *Aha*! (Understanding)
   b. *Conative* (directed at the listener, expression of a speaker's wish):
      (i) Getting someone's attention, e.g., German *Pst*!
      (ii) Demanding action or response, e.g., *Sh*! 'Be quiet!'
   c. *Phatic* (establishment and maintenance of contact), e.g., *Uh-huh* (backchanneling)

I define animal-oriented interjections (AOIs) as conative interjections of the primary type that require action. As noted by Bynon (1976: 41), some may be based on imitations of naturally occurring cries and, therefore, have an onomatopoeic origin. AOIs are not the only way to command animals. Other linguistic means can also be used:

(2) Some animal command strategies
   a. Onomatopoeic expressions: English *tuck-tuck-tuck* (directed to chickens)
   b. Nouns: *dog, doggy* (directed to dogs)
   c. Animal names: *Max, Bella* (directed to dogs)
   d. Verbs in the imperative mood: *sit, down, stay, come* (directed to dogs)

All of these expressions can be used to give commands to domestic animals and can be analysed as conative expressions, directives, or calls. Different ways of referring to these expressions can be found in the linguistic literature, e.g., "domestic animal calling" (Bynon 1976), *huchements* (Enckell & Rézeau 2003: 14; Dor 2003; Ferret 2013), "animal-oriented interjections" (Enfield 2007: 314-315; Smith 2012), "directives to domestic animals" (Amha 2013), "conative animal calls" (CACs) (Andrason 2022; 2023; 2024; Andrason & Karani 2021), "animal directives" (Heine 2023: 28).

[22] Examples taken from Treis 2023, slide 9.

Since I will be discussing conative interjections of the primary type in this paper, I think the phrase "*animal-oriented interjections*" (AOIs) is appropriate to refer to this type of words. Terminologically, the expressions "domestic animal calling", "directives to domestic animals", "conative animal calls", and "animal directives" are much more general.

AOIs can be classified based on two factors: (i) the animal species they target, and (ii) the type of action they command. As we will see in the following section, in the languages of the Iberian Peninsula, each type of domestic animal has its own set of AOIs which may contain different interjections for different actions. This has also been observed in other language families (Andrason & Karani 2021; Heine 2023: 251-254).

2. Animal-oriented interjections in the languages of the Iberian Peninsula

In the Iberian Peninsula, six Romance languages are spoken: Spanish, Catalan, Galician, Portuguese Asturian, Aragonese, and Basque. Five of them are spoken in Spain (Spanish, Catalan, Galician, Asturian, Aragonese, and Basque), and Portuguese is the official language of Portugal. Galician and Portuguese can be considered as varieties of the same language called Galician-Portuguese, although there are notable differences between the two varieties. Basque is a language with no known linguistic relatives, which is also spoken in the south of France (as well as Catalan). Its phonological, morphological, and syntactic structure is very different from that of the Romance languages (Trask 1997) with which it coexists (Spanish and French). Spanish has exerted a notable influence on Basque, especially in the vocabulary.

The main source for animal-oriented interjections in the languages of the Iberian Peninsula is García de Diego's dictionary (1968: 61-104)[23]. García de Diego offers us a wide sample according to the animals to which these interjections are addressed.

Based on the data in this dictionary, a classification of AOIs in the IP languages can be worked out. Two main factors are relevant for such a taxonomy: (1) the animal species addressed and (2) the type of action required[24]. The following table is a preliminary proposal for this classification. Examples are in Spanish[25], those in other IP languages are given with the initial letter of the corresponding language in parentheses.

Table 1: Proposed classification of AOIs in the IP languages

ACTIONS / ANIMALS	CALLING	SCARING OFF	STOPPING	GOING BACK	TURNING RIGHT	TURNING LEFT	SPEEDING UP
Horses	*¡Che!*		*¡So!*	*¡Zajatrás!*	*¡Hullao!*	*¡Huesque!*	*¡Arre!*
Donkeys	*¡Ru!*		*¡So!*				*¡Ei!*
Goats	*¡Be!*	*¡Eja!*	*¡Agó!*				*¡Prrrr!*
Pigs	*¡Karr!*	*¡Achi!*					*As!* (B) *Piu!* (P)
Chickens	*¡Pita!*	*¡Ox!*					
Dogs	*¡Cus!*	*¡Tuso!*					

[23] See Moreno Cabrera (2020: 91-96) for a summary of this important dictionary.
[24] This contradicts the claim that AOIs are devoid of semantic content (Meinard 2015: 153), as pointed out by Heine (2023: 249).
[25] Some of these examples are from different dialects of Iberian Spanish.

Cats	*¡Mis!*	*¡Zap!*			*Hua!* (C) [26] *Soba!* (P) *Haxi!* (B)
Sheep	*¡Brrr!*		*¡Orbeti!*		*¡Brrriá!*
Ducks	*¡Birí!*	*¡Ox!*			
Cattle	*¡Urri!*	*¡Oojó!*	*¡Oooh!*	*¡Ticha!*	*¡Rri!*

B= Basque; C= Catalan; P = Portuguese

I will now discuss some examples of these AOI types in the different IP languages. The following list contains some of the AOIs used for calling pigs (García de Diego 1968: 73-78):

(3) Pig calling AOIs:

a. KARR: Spanish *corr*, *curr*, *quirrín*; Portuguese *curri curri*, *corricho*, *curú curú, kier, kirr, corr, cur, curr, gurri, guto; coch*
b. GERR: Spanish *guiro*, *gurri*, *gurín gurín*; Portuguese *guri guri*
c. COCH: Spanish *cuch coch*, *coche*, *cochi cochi*, *cocho*, *cochó*; Catalan *cutxo, cutx*; Portuguese *coche, reco, quia, chua, bicá, bico;* Galician *cuch*
d. CH/SH: Spanish *chiku chiku*, *chin chin*, *chino*; Portuguese *cho cho*, *chua chua*; Basque: *atx*, *txiki txiki*, txuku, ttipri, *ti ti*, *tilin tilin* (piglet), *tu*, *tturri tturri*

These interjections seem to be based on an imitation of the pig's grunt and, therefore, show onomatopoeic features. The velar consonants of the interjectional roots *karr* and *gerr* may have originated as imitations of pig grunt (a low short guttural sound).

In Portuguese, the articulation point of the rhotic consonant is also velar. The root *coch* also has a velar consonant plus a palatal affricate. From this AOI two nouns for pig are derived in Spanish: *cocho* and *cochino; cochino* is also used in Spanish as an adjective meaning 'filthy'. The trill (*r*) appears frequently in calling AOs related to pigs. It can be associated to an imitation of pig grunting but, at the same time, the trill sound, with its multiple vibrations is used to call the animal's attention. As a result, this phoneme seems to have both an onomatopoeic and an appellative import.

To scare away pigs, the following AOIs are used (4):

(4) AOIs to scare away pigs:

a. Basque: *brrrtxo*, *atxo*, *txo*
b. Spanish: *asque*, *ush*, *uch*
c. Portuguese: *coche coche lá*, *coche coche pra lá*
d. Galician: *cuch*
e. Catalan: *uix*

These AOIs show the palatal affricate (Basque *tx*, Spanish *ch*) or fricative (Portuguese *ch,* Catalan *ix*) seen in the preceding AOIs. In addition, the Portuguese examples include an adverb of place (*lá*, *pra lá*). In Basque, a long version of the trill is used to scare away pigs

[26] These interjections are used to set a dog on someone.

(*brrrtxo*). In García de Diego's opinion this trill is used to provoke movement (García de Diego 1968: 89). These AOIs are uttered with a special intonation in order to achieve the desired effect.

Concerning chickens, García de Diego (1968) lists the following AOIs to call and scare away chickens:

(5) AOIs to call chickens:
   a. Spanish: *pita pita*
   b. Portuguese: *pila pila*, *pilocas*, *piloquinhas*, *chi-chu*, *chichu*, *chari*
   c. Basque: *titi*, *tita*, *irra, urra*, *turra tturra*
   d. Catalan: *titi*, *tiu*

(6) AOIs to scare away chickens:
   a. Spanish: *os*, *ox, oxe, jos*, *jospa*, *jospe*, *jospo*, *hospo*, *of*, *oxaquí*, *xoba*
   b. Portuguese: *xo, xo xo-qui, cho, chote*
   c. Catalan: *uix*
   d. Basque*: ux*

Concerning the 'calling' AOIs, the high front vowel /i/ dominates in Spanish, Portuguese and Catalan, with a few occurrences in Basque. This vowel occurs in *pío pío* 'cheep', the Spanish standard onomatopoeia for chickens and small birds. This phoneme is normally associated with high pitched sounds made by small animals, so these AOIs have a clear onomatopoeic nature. As for Basque, in the AOIs *irra, urra*, *turra tturra* the rhotic trill is used to provoke movement. As I will suggest in Section 3, the trill could naturally be associated with movement. The AOIs to scare away chickens share a back vowel (/o/, /u/) and a fricative (Portuguese and Catalan *x,* Spanish *j*) or affricate (Spanish *x)*. The combination of a back vowel plus a palatal consonant could be designed to make a sound that chickens supposedly don't like. The Spanish AOI *oxaquí* comes from the phrase *ox de aquí* '*ox* from here', and has been heard in Hornillayuso, a small village in the province of Burgos, Spain (García de Diego 1968: 90). The AOI *of* has been documented in Andalusia (García de Diego 1968: 90). The Spanish verb *oxear* 'to scare away chickens' is derived from *ox*.

There are various AOIs to call dogs in Iberian Peninsula languages. García de Diego (1968: 85) mentions the roots c*as, kis, cos, cus,* and *chuch,* illustrated in the following examples:

(7) Dog calling AOIs:
   a. Spanish: *quis quis, quisu, cus, cusco, cuz* (to feed them), *cuzo*, *cuch, cucho, oiche, picho, pocho, chichi, chus, chuch*, tuso, *tuba*
   b. Catalan: *cos, gos, hua*
   c. Portuguese: *pucho, bocho, chinho*

Some of these AOIs include the high back vowel /u/ which appears as a labio-velar approximant /w/ in the standard *guau* 'woof' onomatopoeia for dog barking. In fact, in languages of different linguistic families, the onomatopoeia for dog has these sounds: Finnish: *vuhvuh*, Japanese *wangwang,* Chinese *wewewe*, Persian *howhow*, Kurdish *wowwow*, Polish *hauhau*, Icelandic *vufvuf*, Hungarian *vauvau* (Abelin 1999: 202). The phonemes /u/ and /w/ have also been proposed in the reconstruction of the word for dog/wolf in different language families: Indo-European **kwon∼*kun*, Proto-Yenisean **kun/*gun* 'wolverine', Proto-Tibeto-

Burman **kwyi*, Proto-Oceanic **nkaun* (Ruhlen 2023: 214). I consider these data to be dismissed as mere coincidences, otherwise they are influenced by certain sound-meaning correspondences of an onomatopoeic nature, an issue that should be investigated further.

The following list contains some of the AOIs used to set a dog on someone (García de Diego 1986: 96-98):

(8) AOIs to set a dog on someone:
   a. Spanish: *uch*, *uis*, *eisa, isca, sus, zuzo*
   b. Catalan: *hua*
   c. Portuguese: *boca, aboca, ceba, cega, soba*
   d Basque: *haxi*

Some of these AOIs contain the back vowels /u/ and /o/, which can be associated with dog barking. The Catalan *hua* is similar to the Spanish *guau*, which corresponds to the Catalan *bub* (Riera & San Jaume 2011: 59). Also, the onomatopoeias *uh*, and *uuuu* are used in Catalan to imitate the howling of a wolf or a dog (Riera & San Jaume 2011: 244-245). The Spanish interjection *¡Sus!* is used to give sudden courage by stimulating to do something with vigour or speed, and comes from the Latin word *sursum* 'upward'. The *zuzo* interjection could be related to *¡Sus!*; in addition, the verb *azuzar,* derived from it, is the standard word for setting a dog on someone in Spanish.

Turning to the interjections to call and scare cats away, the following examples can be given:

(9) AOIs to call cats:
   a. Spanish: *mini, mino, minini, minino* 'cat'*, mi, misino, mizo, micho*
   b. Catalan: *mix mix*
   c. Portuguese: *bich, bichinho*
   d. Basque: *miziñaa*, *mizintxo* (García Diego 1968: 81), *miz*, *mix*, *mis*, *itx*

(Santisteban 2007: 144)

In most of these words there is the syllable /mi/. The onomatopoeia for the cat sound is *miau* or a variant thereof in these languages. Therefore, it is safe to say that this interjection is derived from an onomatopoeia. Interjections to scare away cats include the following:

(10) AOIs to scare away cats:
   a. Spanish: *zape, zapo, chape, chapi, sip*
   b. Catalan: *zap*
   c. Portuguese: *sape*
   d. Basque: *zapi*

None of these interjections contains a nasal stop. In addition, these interjections are usually pronounced with a sharp, startling sound that frightens the animal.

The AOIs to horses, mules and donkeys are of different kinds. There are interjections to speed up (11), to stop (12), to direct back (13) or to change direction (14-15).

(11) AOIs to speed up horses:

a. Spanish: *ei*, *au*, *arre, rrria*
b. Portuguese: *ari*, *arre*, *arri*
c. Basque: *arre*, *arri*, *aida, aira, aiba*

The most common AOI to speed up horses in the languages of the IP is *arre*, which is usually reduplicated and followed by the noun for the corresponding animal: *burro* 'donkey', *caballo* 'horse', *yegua* 'mare'. The interjection *rria* has been documented in Castile and Valencia (García de Diego 1968: 94). Both AOIs contain a trilled /r/. A different set of AOIs are used to stop horses:

(12) AOIs for horses to stop:
a. Spanish: *so, sooh, ele*
b. Portuguese: *cho*
c. Catalan: *rosto, xap, bo, sio*
d. Basque: *itxo*

So is the most used interjection to stop horses in Spain. The corresponding Portuguese interjection has a palatalized sibilant. The back vowel is usually lengthened and accompanied by low intonation. AOIs used to direct horses to go back are mostly derived from adverbs or verbs.

(13) AOIs for horses to go back:

a. Spanish: *tras, ceja, zajatrás, sajatrás*
b. Catalan: *aixa*

The Spanish AOIs are derived from the adverb *atrás* 'back', and from the verb *cejar* 'to move back, to give way' (García de Diego 1968: 100). Specific AOIs are used to direct horses to make a right turn (14), or to make a left turn (15).

(14) AOIs for horses to turn right:

a. Spanish: *hue, huellao*, *ollao*, *hullao*
b. Catalan: *ooo*

(15) AOIs for horses to turn left:

a. Aragonese: *uésique, huechiqué, güesque, huesque, boeisque, boisque, ueisque, uesque, vinesí, bienisí, hullao, huellao*
b. Catalan: *ooo*, *vina ací, huaixque, oixca, oixque, ollao, vitiollá*

These interjections are used by cart drivers when riding alongside or on the cart. The wagoner usually goes to the left, either walking alongside the horses or riding on the wagon, so the interjections to turn left are derived from the adverb of place, which indicates the location of the speaker (*aquí* 'here'). The Aragonese AOIs are derived from the sentence *ueis aquí* 'come here' and from the French *vien ici* 'come here'. The Catalan AOIs have a similar origin.

Concerning sheep, Garcia de Diego (1968: 95-96) mentions the following AOIs to call sheep:

(16) Sheep calling AOIs:

a. Spanish: *brrrr*, *brrriá*, *prrr*, *rrrr*, *ria*, *irra*, *rrrt*, *rrrite*, *rrita*, *rritacá*, *trrr*, *turria*, *quira*, *quirín* (for lambs)
b. Galician: x*arré*
c. Basque: *brrrra* (Santisteban 2007: 69), *prrra* (directed to cows; Santisteban 2007: 169)
d. Catalán: *arruix*

All these AOIs have a lengthened trilled rhotic and are used primarily to gather a flock of sheep. In dialectal Spanish, the verb *arritar* 'to gather the scattered flock, to drive the dog to the stray sheep to bring them back to the flock' is derived from the AOI *rrita* (García e Diego 1968: 95, 593). These observations will be particularly relevant for the proposals put forward in the following section.

3. Trilled animal-oriented interjections in Iberian languages

In this section I will discuss the possible sound symbolic interpretation of AOIs including a trill in Iberian languages. A brief explanation of the articulatory characteristics of trills will be useful. The trill sound has been characterised by Ladefoged & Maddieson (1996: 217) as follows:

> The primary characteristic of a trill is that it is the vibration of one speech organ against another, driven by the aerodynamic conditions. One of the soft moveable parts of the vocal tract is placed close enough to another surface, so that when a current of air of the right strength passes through the aperture created by this configuration, a repeating pattern of closing and opening of the flow channel occurs.

As an example, Standard Spanish *r*, as in *perro* 'dog', is an alveolar trill and contrasts with the rhotic tap of *pero* 'but'. The articulatory and acoustic properties of trills can be subjected to a sound symbolic interpretation.

One of the earliest sound symbolic interpretations of trills is that given by Plato. As noted by Ademollo (2011: 306-307), in sections 426c-427c of the *Cratylus*[27], Socrates discusses several letters in the Greek alphabet and interprets them as imitations of certain properties:

> Socrates starts with ρ (i.e. the sound /r/, as he should rather say). ρ seems to him 'to be an instrument, as it were, [expressive] of every sort of motion' […] At the end of the digression Socrates resumes what he was saying about the power of ρ, which is used by the namegiver to *imitate movements* […] Then he gives several examples of words which contain ρ and whose meaning is related to movement (d6-e4): ῥεῖν 'to flow'; ῥοή 'stream'; τρόμος 'trembling'; τρέχειν 'to run'; κρούειν 'to strike'; θραύειν 'to fracture'; ἐρείκειν 'to rend'; θρύπτειν 'to break'; κερματίζειν 'to crumble'; ῥυμβεῖν 'to whirl'. Socrates also explains why the name-giver employed precisely this letter to imitate movement: 'He saw, I think, that the tongue in pronouncing this letter is least at rest and most agitated' (e4-5).

[27]Plato's *Cratylus* is considered by the specialists as the first major work on sound-symbolic research (Genette 1994: 7-28; Joseph 2000: 13-92; De Cuypere 2008: 11-15).

The idea that trilled consonants can be used to mimic movement has been around since Plato. In the history of the study of sound symbolism, it appears in authors such as Leibniz, De Brosses, Hervás y Panduro or Nodier, among others[28]. The intermittent movements of the tip of the tongue to produce a trill open up the possibility of using the trill to mimic movement in general, so the use of trilled sounds to imitate movement should not be ruled out.

In English, the rhotic consonant appears in many of the words that denote or imply some kind of movement: *race*, *radiate*, *raid*, *rain*, *raise*, *rally*, *ram*, *ramble*, *rapid*, *rap*, *rash*, *rattle*, *reach*, *react*, *reap*, *receive*, *regress*, *remit*, *remove*, *repeat*, *replace*, *rerun*, *restore*, *retreat*, *return*, *revert*, *revolve*, *ride*, *rinse*, *riot*, *ripple*, *rise*, *rivet*, *rock*, *roll*, *romp*, *rouse*, *rove*, *row*, *rub*, *ruffle*, *run, rush*. Some of these words have a fossilized, non-compositional prefix *re-*[29].

In Arabic, many of the roots that denote some kind of movement have a rhotic consonant. Here are some examples of roots that indicate some kind of displacement[30]: *jarra* 'to draw, to pull, to tow', *darra* 'to flow', *farra* 'to flee, run away', *karra* 'to turn around, to return, to come back', *marra* 'to pass, go, walk', *rabaʕa* 'to gallop (horse)', *rajaḥa* 'to incline (scale of a balance), *rajaʕa* 'to come back, return, come again', *rajila* 'to go on foot, walk', *raḥada* 'to depart, leave, *radda* 'to send back, go bring back', *radafa* 'to come next, follow, to ride behind', *rasaba* 'to sink to the bottom', *rasila* 'to send out, to dispatch', *rafaʕa* 'to lift up, raise aloft, heave up', *raqiya* 'to ascend, climb', *rakaḍa* 'to race, run, rush', *ramā* 'to throw, cast, toss aside', *rāha* 'to go away', *rāda* 'to walk about, move about', *rāma* 'to go away', *daraja* 'to go, walk', *kharaja* 'to go out, walk out'. All of these roots have two things in common: they denote movement, and they contain a rhotic consonant.

The trill is often used in onomatopoeia. For example, in Iraqw, a Cushitic language, the rhotic trill is used as an onomatopoeia for a spider making a web or for the sound of a sewing machine (Mous 2024: 70). Tswana, a Bantu language, also has trilled onomatopoeia: *porr porr-porr* 'noise of a horn or hooter', *tsirr*, *trerr* 'sound of an insect such as a cicada', *brruu* 'sound of an engine, compressor' (Chebanne 2024: 175-176).

Similar examples can be found in Beria, a Saharan language (Elnur & Jakobi 2024: 241), Anindilyakwa, an Australian language (Bednall 2024: 254-255) and Ngarla, another Australian language (Westerlund 2024: 299). In the Awtuw language of New Guinea Feldman (1986: 196) notes that trills are used to mimic certain animal sounds:

> In the Awtuw language of Papua New Guinea, dogs and pigs each have their individual names, and different sets of names are employed for male and female animals. Pigs are called by interspersing their name with a prenasalized, lax, voiced, protracted bilateral trill followed by a nasalized low front vowel. Chickens are called with a protracted voiced, apical-alveolar trill uttered with a high pitch followed by a series of very tense bilabial fricatives with expressive velar air. In Basque, rhotic trills may exceptionally occur in the onset position of some onomatopoeic expressions: *rauraurrau, rapataplau* 'rattling (drum), *fra-fra* 'sound of machinery'' (Ibarretxe-Antuñano 2024: 492). In all these cases, the trill imitates certain types of sounds.[31]

[28] See Moreno Cabrera (2020: 97, 234, 247, 356).

[29] The Latin prefix *re-* means 'again; back; anew, against'. Some of the English words beginning with *re-* come from the French language. This prefix is used productively in many derived words to indicate the repetition of an action: *realign*, *reapply, rearm*, *rearrange*, *reassemble...*

[30] Examples taken from Wehr (1980).

[31] In addition to sounds and movement, the acoustic properties of trilled consonants can also suggest roughness (Winter, Sóskuthy, Perlman & Dingemanse 2022).

The trill appears in a significant number of AOIs in the Iberian languages. As we have seen in the previous section, the trill (*r*) occurs in Spanish in AOIs addressed to pigs, sheep and horses.

Concerning pig summonses, we have seen the following examples repeated from (3):

(17) Pig calling AOIs:

a. KARR: Spanish *corr*, *curr*, *quirrín*; Portuguese *curri curri*, *corricho*, *curú curú*, *kier*, *kirr*, *corr*, *cur*, *curr*, *gurri*, *guto*, *coch*
b. GERR: Spanish *guiro*, *gurri*, *gurín gurín*; Portuguese *guri guri*

The above interjections are usually reduplicated and can be subjected to a sound symbolic analysis. For example, the rhotic trill (*r*) in these AOIs can be viewed as an imitation of pig grunting and the low back vowels (*o*, *u*) can also be associated with the low pitch of pig grunting. In addition, the trill sound, with its multiple vibrations is used to call the animal's attention; this can also be seen in the Spanish *arre* AOI employed to urge horses.

In (16), I listed several sheep calls containing a trill, including the following:

(18) Sheep calling AOIs:

a. Spanish: *brrrr*, *brrriá*, *prrr*
b. Basque: *brrrra*[32], *prrra* (directed to cows[33])

In these examples, we see a complex syllable onset consisting of a bilabial stop (/p/, /b/) and a trill. The bilabial stop can be seen as an imitation of sheep bleating.

The onomatopoeia for bleating in Spanish and Basque is *beee*, so this AOI could be derived from an onomatopoeia.

With regard to the trill, the following observation by García de Diego is relevant here:

> The more or less reduplicated *rr* arouses a sensory effect of movement, and in animals the voices with *rr* of the person who directs them make them activate the step. Corominas is right to say that 'the consonant *rr* is understood by horses as a marching order.' […] It is not only the *rr* of arre that is especially addressed to the horses, but the rr is the fundamental of the groups in which *rr* has a consonant at the beginning or end.
>
> (García de Diego 1968: 66, my translation)

The trill is particularly common in Basque AOIs, as can be seen in the following examples (examples from Santisteban 2007; Mitxelena & Sarasola 2024):

(19) The trill in Basque AOIs:

a. *biri-biri* 'calling AOI addressed to ducks'
b. *brrra* 'calling AOI addressed to sheep'
c. *brrrtxo* 'used to scare away pigs'

[32]Santisteban 2007: 69.
[33]Santisteban 2007: 169.

d. *ttarro ttarro, ttipirrin ttipirrin*, *tturrin tturrin*, *tturru tturru*, *txo-marro-txo-txo* ‘pig calling AOIs’
e. *txokirrin-txo-txo* ‘sparrow calling AOI’
f. *kuurra*, *pirra* (*ta purra)*, *furra*, *purra* ‘hen calling AOIs’
g. *purri-purri*, *urre* ‘dove calling AOIs’
h. *pra, prrra* ‘cow calling AOIs’
i. *hurri* ‘AOI used to urge the dogs to attack someone’

All these examples show that the trill can be interpreted in a sound symbolic way, suggesting an incitement to animal movement. An interesting case of this type of sound symbolic interpretation of the trill is reported in the Aymara language, where the AOI *urro* is used to start resistant donkeys (Smith 2012: 317). This AOI probably comes from the Spanish word for donkey, *burro*, as it is only used for donkeys (Smith 2012: 318). Apparently, the Aymara people reanalysed the Spanish word *burro,* used as a vocative, into an interjection, *¡Urro!* to get the donkeys moving. The presence of the trill could be one of the factors causing this lexicalization.

4. From AOIs to regular nouns: The case of Spanish *perro* ‘dog’ and Catalan *gos* ‘dog’

In his monograph on interactives, Heine (2023) discusses the grammaticalization processes in which they are involved. Concerning animal directives, he mentions the fact that they can also be grammaticalized:

> For good reasons, animal directives are described by Andrason and Karani (2021) as a prototype, and in fact these directives do not form a discrete category clearly set off from sentence grammar, and the boundary between the two is generally fluid. Less prototypical instances of animal directives show various kinds and degrees of integration in sentence grammar via grammaticalization or lexicalization.
>
> (Heine 2023: 259).

Some cases of grammaticalization of AOIs have been noted in the relevant literature. The following examples from Ayt Hadiddu (Berber, Afroasiatic) are given by Bynon (1976: 61) and are cited by Heine (2023: 261): *h(zi)n!* ‘to make a goat kid come’ (> *zizi*, *hzizi* ‘goat’); *khullu!* ‘to make a chicken come’ (> *khullu* ‘chicken’), *rra!* ‘to make a donkey advance’ (> *rrarra)* ‘donkey’; *sipsil!* ‘to make a cat come’ (> *sibsi*, *sipsi* ‘cat’); *Sht(a*) ‘to make a mule or donkey stop’ (> *štašta* ‘mule’); *zaw!* ‘to make a cow advance’ (> *zawa* ‘cow’). These verbs are derived for nursery words related to the corresponding animal (given in parentheses).

The Spanish common noun *arriero*, meaning ‘muleteer’, is derived from *arre.* As a driver of mules, the muleteer must use frequently this interjection. The Spanish verb *arrear* ‘to drive horses, mules or donkeys’ is also derived from *arre.* Some lexical items derived from AOIs are listed in (20).

(20) Spanish lexical items derived from AOIs:
a. *arre* > *arrear* ‘to drive horses, mules or donkeys’
b. *are* > *arriero* ‘muleteer’

c. *ox* > *oxear* ‘to scare away chickens’

d. *rrita* > *arritar* ‘to gather the scattered flock together, to drive the dog to the stray sheep to bring them back to the flock’

e. *zuzo* > *azuzar* ‘to set a dog to someone’

f. *chis*, *chist* > *chistar* ‘to say *chist* to have human attention’ > *chiste* ‘joke’

Chis, *chist* are not AOIs, since they are addressed to humans. They are interjections to get someone’s attention. The derived noun *chiste*, ‘joke’, could be explained by the fact that a joke can be used to get and keep someone’s attention.

In the languages of the Iberian Peninsula, there are two notable cases of AOI lexicalization. Both of them concern the nouns for *dog*.

The standard Spanish word for ‘dog’ is *perro*, the etymology of which is disputed. The following is a translation of the entry for *perro* in the Spanish etymological dictionary by Corominas (1973: 453; my translation):

> **PERRO**, 1136. A word exclusive to Castilian that in the Middle Ages was only used as a pejorative and popular term as opposed to *can*, a noble and traditional word. Its origin is uncertain, probably a word of expressive creation, perhaps founded on the expression *prr*, *brr* with which the shepherds incite the dog by using it to make it move the cattle and to make the cattle obey the dog. [...] the Iberian and Celtic etymologies that have been proposed are impossible.

In Section 2 of this article, we saw the Spanish AOIs *prrr* and *brrr* used to call sheep. Shepherds also use these AOIs for the dogs to gather the sheep. Hearing the AOI, the dogs head towards the sheep and gather them. Dogs are often used to help herd sheep. In fact, there are sheepdogs: dogs specially trained to herd sheep. In this way, the interjection used to call the sheep can also set off the herding dog. This makes it possible to shift the addressee: the interjection *prrr* is now used to make the dog herd the sheep. This is the first step in the grammaticalization of *prr;* I will call it *addressee shift*. Once the displacement of the addressee has taken place, *prr* can also be used to simply call a dog. This is a *generalization* of the use of the interjection.

The next step is pragmatic: a directive speech act becomes assertive. So *prr* is no longer used to call dogs, but to refer to them, perhaps in the variant *perr.* I will call this change *assertivization*. As a result, we can assume the following stages in the process:

(21) Lexicalization stages of AOIs:

a. Directive stage (DS):
   i. DS1: *prr* as a shepherding interjection
   ii. DS2: *prr* as a dog shepherding interjection (addressee shift)
   iii. DS3: *prr* as a dog calling interjection (generalization)

b. Referential stage (RS): RS: *prr* used as a reference to a dog (assertion)

c. Lexical stage (LS):
   i. LS1: phonological adaptation: /pe/ + /rro/
   ii. LS2: morphological adaptation: /perr-/ + /o/

Once *prr* is used to refer to a dog, it must be integrated into the noun class. To achieve this, it is necessary to give the interjection an appropriate phonological and morphological form.

In terms of phonological form, [prr] is analysed as two syllables (/pe/ + /rro/) to match the syllable structure of the Spanish language. The phonological form is then submitted to the morphological component and analysed as the stem /perr-/ and the noun suffix /-o/. This makes it possible to have both *perro* / *perros* 'dog' / 'dogs' and *perra* / *perras* 'bitch' / 'bitches'.

The DS1, DS2, and DS3 steps are not necessarily sequential; they can coexist as different uses of this interjection. The real transformation of the interjection occurs in the RS and LS stages. This process is similar to the grammaticalization of ideophones (see Heine 2023: 309-319; Andrason & Heine 2023: 245-256). These authors give the following table summarizing the main changes of this process (Andrason & Heine 2023: 247):

Table 2: Grammaticalization of ideophones

	Initial stage	**Final stage**
General	The ideophone forms a distinct unit of discourse	The ideophone is integrated within word classes of sentence grammar
Function	Expressive	Non-expressive
Meaning	Does not change the clausal meaning	Contributes to the meaning of a clause
Syntax	Unattached	Constituent of a clause
Morphology	Invariable	May take inflectional and/or derivational morphology
Prosody	Prosodically distinct, forms an intonation unit of its own	Integrated in the intonation contour of the clause
Placement	Free, can form an utterance of its own	Restricted to slots provided by its morphosyntactic status as a noun, verb, adjective, or adverb
Discourse functions	Resistance to being negated or interrogated	Can freely be negated and interrogated

The proposed way of analysing the grammaticalization of the Spanish AOI *prrr* is consistent with the characteristics pointed out by Heine and Andrason for the grammaticalization of ideophones. As an AOI, *prrr* is a distinct unit of discourse, does not change the meaning of the clause, is unattached, cannot take morphological affixes, is prosodically distinct, has a holophrastic character, and cannot be negated or questioned. As a regular noun, *perro* 'dog' has all the properties listed in the right column of the Table 2.

The word for 'dog' in Catalan is *gos*. The origin of this word is said to be an animal-oriented interjection to call dogs (Corominas & Pascual 1984: 186). The following list includes all the relevant examples from the dog calling interjections given in (7):

(22) Dog calling AOIs in Spanish and Catalan:

a. Spanish: *quis*, *quisu*, *cus*, *cusco*, *cuz*, *cuzo*, *cuzco*, *gus*, *guz*, *guzco*

b. Catalan: *cos*, *cus*, *caus*, *gos*

All these interjections have a guttural plosive (/k/-/g/) and a back vowel (/o/ or /u/), which are also present in the Spanish onomatopoeia for dog *guau* [gwaw]. In Catalan, there are some onomatopoeic words for dog barking that have a back vowel: *ahú*, *aú*, *bub*, *gu*, *hu* (Riera & Sanjaume 2011: 288). Thus, it can be said that these AOIs are to some extent related to the onomatopoeia of dog barking and show a certain degree of iconicity. The regular Catalan word for 'dog' is *gos,* clearly derived from *gos*, one of the interjections used to call dogs. Note that, as an interjection, this word cannot be pluralized nor used to refer to a dog. But the Catalan common noun *gos* can be inflected for number and gender: *gossos* 'dogs', is masculine, and there is a feminine version of it: *gossa* 'bitch' and *gosses* 'bitches'. These data show that it has been grammaticalized as a noun. Therefore, this AOI has gone through all of the stages listed above: DS (*gos*) → RS (*gos*)> LS (*gos*-(*sos*), *goss-a*- ((*goss*)*es*)).

The grammaticalization of interjections is also similar to the process of *de-iconization*, which is explained by Flaksman (2015; 2020: 95) as follows:

(23) Stages of de-iconization (also see Flaksman & Kilpatrick, this volume):

SD-1: highly iconic (non-integrated) interjections (*boom*! *bzzz*! *crash*!)

SD-2: integrated iconic verbs, nouns, etc., which haven't undergone any phonosemantically significant sound changes and retain their original meaning (*buzz*, *peep*)

SD-3: words which either have lost their original meaning (*clock*) (SD-3b) or have changed significantly in their original form (*laugh*) (SD-3a)

SD-4: words, iconic origin of which could be established only by etymological analysis (*cloak*)

Flaksman's SD-1 and SD-2 correspond more or less to the DS, SD-3a to the LS1 and LS2, and SD-3b to the RS. My proposal could then be seen as a special adaptation of Flaksman's de-iconization scheme to the examples I am discussing here, assuming that they have an iconic nature. Native Spanish and Catalan speakers no longer associate the nouns *perro* and *gos* with a dog-calling interjection. This means that these interjections lost their original directive and iconic meaning, and are, therefore, are at Flaksman's SD-4 stage.

To conclude this section, let me examine some other cases of AOI grammaticalization in Spanish in the light of the previous discussion. There is an additional Spanish word for 'dog' that comes from the AOIs listed above. The word is *gozque* 'small yapping dog', an old-fashioned word no longer in use (it appears in the famous novel *Don Quijote de la Mancha*). Following Corominas & Pascual (1984: 186), this noun is a grammaticalization of the interjections *cuzo*, *cuzco*, or *guzco*. They argue convincingly against the *canis gothicus* etymology proposal*,* since "it has no historical basis and is phonetically impossible." This results in the following evolution: DS (*kus(k), gus(k))* → RS (*guzk*-) > LS (*gozqu-e*/ *gozque-s*).

There is another Spanish word *chucho* 'dog (despective), stray dog, mongrel'. Its origin is *chuch*, a dog-calling interjection, seen in Section 2 above. Following Corominas & Pascual (1984: 400) it must have evolved as follows: DS (*chuch* → RS (*chuch*-) > LS (*chucho*).

There is a clear relationship between *chucho* and *zuzo*, which is used to set a dog on someone (see Section 2). From *zuzo* the verb *azuzar* 'to set a dog on someone (by saying *zuzo*)' is derived as follows: DS (*zuzo)* → RS (*zuzo*) > LS (*a-zuza-r*).

From *chuch*, used as an interjection to set a dog on someone, the verb *achuchar* 'to set a dog on someone' is derived, and this meaning is generalized to 'to push, to jostle' in reference to people: DS (*chuch* → RS (*chucho*) > LS (*a-chucha-r*).

The noun *achuchón* 'a squeeze, shove, push' is a nominalization of *achuchar*. The etymology of *arrechucho* 'sudden impulse, fit, outburst, sudden indisposition' and *arrechuchar* 'to push' has not been clarified (Corominas & Pascual 1984: 351-252). Corominas (1973: 64) suggests the word *arrecho* 'stiff, rigid, upright' (from the Latin *erectus*). However, the possible influence of *chuch* and *arre* should not be excluded.

Conclusion

Animal-Oriented Interjections are used to give orders to domestic animals in both rural and urban areas. In this paper, I have discussed the sound symbolic and onomatopoeic aspects of some notable AOIs in the Iberian Peninsula languages. The Iberian languages have AOIs used to call, chase away or direct animals, and which differ depending on the animals addressed. Some of them seem to be derived from onomatopoeic expressions. This paper has given examples of all these types. Of these, those with a trill were discussed in Section 3. From a sound symbolic point of view, the rhotic trill can suggest some animal sounds as well as movement. It has been suggested that the trill in the AOIs, which are intended to provoke the animals to move, helps them to do so in a natural way. Many Basque calling AOIs have this sound. In the last section of the paper, some cases of AOI grammaticalization have been discussed. The most striking cases are the regular words for 'dog' in Spanish and Catalan. They do not come from the corresponding Latin word *canis*, but from dog-calling interjections. In order to describe this phenomenon, a series of grammaticalization steps have been proposed: the original interjections are transformed into referential words and then integrated into the lexicon as regular nouns through phonological and morphological adaptations.

Abbreviations

AOI	Animal-oriented interjections	LS	Lexical stage
B	Basque	P	Portuguese
C	Catalan	RS	Referential stage
DS	Directive stage	SD	Stage of de-iconization
IP	Iberian Peninsula		

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Against the tide: How language-specificity of imitative words increases with time (as evidenced by Surprisal)

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The article aims to illustrate how language-overarching iconic traits which make onomatopoeic words more or less similar cross-linguistically tend to diminish under the influence of the mechanisms of language change. The first part of the paper deals with the systemic arbitrary restrictions imposed on onomatopoeic words at the moment of their coinage and on how iconic words violate them. The second part focuses on the aspects of language evolution which lead to the loss of the primary iconic form-meaning correlation which is crucial for imitation. In particular, we explore the potential of phonemic bigram Surprisal as a markedness feature in iconic words and examine how it decreases with time. The research is based on 1317 English words which are iconic by origin. Examples from other languages are also provided.

Keywords: *iconicity, onomatopoeia, de-iconization, language universals, Surprisal*

Introduction: Imitative words, iconicity, research data and methods

Imitative words exhibit an iconic correlation between form and meaning. Iconicity is a relationship of similarity (after Peirce 1940). The most prominent subclass of imitative words are onomatopoeic words (see Section 1). Onomatopoeic words are lexical items that imitate sounds; therefore, they exhibit *acoustic similarity*, e.g., *cuckoo*, *meow*, *ding-dong* resemble a cry of a bird, that of a cat, and the sound of a bell respectively. In these examples, people use their voice to *copy* the natural sounds they hear, for instance, by matching high-pitched sounds with high pitch, low-pitched sounds with low pitch, and abrupt sounds with plosive consonants, as explained in Section 1.

Denotata of imitative words are more or less similar across languages (see Section 1.2): for onomatopoeic words, such denotata are sound sequences with certain acoustic characteristics. For example, the vocalizations made by cats are consistent across the globe, which leads to similarities in the onomatopoeic words used to represent them. In English, for instance, this sound is expressed as *meow*, which is similar to *mjau* in Russian and *miau* in Spanish, and *nyan* in Japanese. All these words have (i) nasal consonant(s) (C^{nas}) and (ii) (long) (open) vowel(s) or a diphthong ($\overline{V}^{open}$). However, there are some limitations imposed on iconic coinage, and, moreover, the differences between imitative words increase with time (see Section 2).

In this article, we consider the restrictions imposed on imitative words at the moment of their coinage and illustrate how the mechanisms of language change widen the gap between (1) the imitated phenomena and (2) the words imitating them. We will achieve this by demonstrating how uniqueness of acoustic patterns of imitative words decreases with their *de-iconization* and how de-iconization can be additionally measured by calculating phonemic bigram Surprisal. In other words, we will trace how and why imitative words which have 'marked' phonological traits when they are coined lose markedness over time, becoming less like their cross-linguistic counterparts (see the *meow*-example above) and more like non-imitative words in their host language.

We argue that imitative words lose their markedness with the increase of the *transitional probability* of speech sounds. Transitional probability indicates how phonemes are combined in words of a language, how they align with speaker's anticipations, leading to faster reading times and shorter fixation durations, as the brain prepares for what is likely to come next (e.g., DeLong, Urbach & Kutas 2005). This study expands this research by examining the influence of iconicity loss through sound changes on the transitional probability of phonemes in words at different de-iconization stages. The difference in de-iconization stages, in turn, reflects diachronic gradation from iconic to arbitrary in the lexicon.

The study is conducted on the data from Flaksman (2024) which was mainly based on the 3rd edition of the *Oxford English Dictionary* (OED). The OED search was done by keywords 'onomatopoeic', 'echoic', 'imitative', or 'expressive' in the *Etymology* section of the dictionary. Altogether 1317 words imitative by origin were included in the study. These data included both non-lexicalized (e.g., *bow-wow*) as well as lexicalized (e.g., *bark*) imitative words, evidently iconic words (e.g., *atchoo*) as well as words which have lost much of their iconic associations (e.g., *kiwi*).

In the first part of this study (Flaksman 2024), etymologies of the investigated 1317 words were analysed with an emphasis on the effects of regular sound changes of the English language on iconicity. All words were classified according to their *de-iconization stage* (hereafter: SD). The procedure is described in Section 2. SD-ratings differentiate English imitative words by their degree of iconicity in present-day English. Before this, Section 1 discusses the way similarity between form and meaning is achieved at the moment of coinage, and what restrictions are imposed on iconic imitation.

In the second part of the study (Section 3), the phonemic bigram Surprisal is measured. Before calculating the Surprisal, a preliminary study was conducted. Firstly, a substantial corpus (N = over 44 million lexemes) of spoken American English (Brysbaert & New 2009) was matched with an American English pronouncing dictionary (Weide 1999) to obtain phonemic transcriptions. Secondly, the obtained dataset was used to compute Shannon's Surprisal (Shannon 1948) on the probability of one phoneme following another. The number of phonemes in each word was totalled and used to calculate average Surprisal within words. Finally, the obtained information was cross-referenced with the SD-ratings obtained in Section 2.

1. Preliminary remarks: Iconicity by imitative coinage, language-specificity and markedness of imitative words

Two contradicting forces clash in the creation of iconic words: (1) a desire to imitate the sound (or other sensory-perceived phenomena) as precisely as one can and (2) a necessity to create a *word*, that is, a unit of language (which is an *arbitrary* system of signs (Saussure 1966 [1916])). Therefore, we observe a battle between iconicity and arbitrariness already at the moment of the creation of an imitative word. In this section, we will describe the mechanisms of imitation in spoken languages which make imitative words iconic and highlight the main restrictions on iconic word-coinage.

1.1 How we imitate: imitative function of phonotypes and segment-by-segment imitation

Newly coined imitative words have a very diffuse (that is, variable) form and a broad meaning related to sensory imagery (Voronin 2006 [1982]; Dingemanse 2017). In some languages (e.g., Japanese, Finno-Ugric languages), such non-integrated (non-lexicalized) iconic words are described as a distinct category and labelled "ideophones" (Voeltz et al. 2001; Dingemanse 2017; Ivanov 2022) (discussed below). In other languages, such as English, Russian, and German, where such words are fewer in number and mostly lexicalized, non-lexicalized imitative words (*ding-dong*) are often ascribed either to the grammatical category of "interjections" (OED) or to "onomatopes" (Shliakhova 2004), as imitation of sound is the most frequent type of imitation in such languages. The lexicalized imitative words (*crash*, *ring*) are considered to be nouns, verbs, adverbs, and other parts of speech.

There are some terminological overlaps in iconicity studies originating from different linguistic traditions; however, regardless of the differences in terminology, there is a consensus that iconic imitation is not only restricted to onomatopoeia. In Table 1, we set the different sub-groups of imitative words apart while highlighting the main criterion for their differentiation – *means of imitation*.

Table 1: Direct and indirect acoustic and articulatory means of imitation in spoken languages (from Flaksman *forthcoming*)

	A. ACOUSTIC	**B. ARTICULATORY**
1. DIRECT (modalities coincide)	Onomatopoeia (1A) onomatopoeic words: *hiss*, *buzz*, *crackle*, *ding-dong*	Mimesis (1B) mimetic words: *gulp*, *pout*, *lick*, *cough*, *hiccup*
2. INDIRECT (modality shift)	Indirect acoustic imitation (2A) synaesthetic imitative words (acoustic): *zig-zag*, *flip-flop*	Indirect articulatory imitation (2B) synaesthetic imitative words (articulatory): *bump*, *bubble*

In Flaksman (2024), two types of iconicity by coinage in spoken languages are distinguished – (1) direct and (2) indirect ones (see Table 1). This distinction is based not on the semantics of imitative words ('sounds of nature', 'artificial sounds', etc.) but on differentiating the *means* of iconic imitation (what is imitated with what).

By *direct imitation*, modalities of perception of (non-linguistic) information from the external world and of production of the (linguistic) information coincide. On the other hand, by *indirect* means of imitation – these two modalities do not coincide; thus, by indirect imitation, a 'switch' from one modality to another (a modality shift) is unavoidable. As speech production (in all spoken languages) simultaneously requires (A) production of a sound wave (acoustics; auditory modality) and also (B) movement of speech apparatus (articulation; movement, kinaesthetic modality), means of imitation are additionally subdivided into (A) acoustic and (B) articulatory (see Table 1).

Onomatopoeic words are, thus, *direct acoustic imitations* (***1A***) – as by onomatopoeia, sound (acoustic modality) is imitated with speech sounds (acoustic modality). Therefore, *acoustic features* of speech sounds are most relevant for imitation by onomatopoeia (in Flaksman (2024), it is argued that the *manner* of articulation of consonants is most significant for onomatopoeia). For example, natural 'hissing' or 'rustling' sounds (of vapour, of leaves,

snake's hissing, etc.) which can be collectively classified as 'noises' are imitated with fricatives (C^{fric}) (***zzz***, ***hiss***, ***sizz***, ***zizz***), as the airflow created by pronunciation of fricatives has a similar acoustic quality. Fricative consonants are acoustically opposed to plosives (C^{plos}), which are acoustically the shortest consonants; thus, the latter are employed for imitation of abrupt sounds (cf. ***p**op*, ***t**ap*, ***c**lap*, ***b**op*). For further examples and correlations – see Flaksman (2024: 58).

Mimetic words (***1B***) imitate (in)voluntary speech apparatus movements used for non-speech production purposes (SAMs) (kinaesthetic modality) by means of articulation (movement of speech apparatus, kinaesthetic modality). These SAMs are, for example, hiccupping, smacking the lips, coughing, chewing, blowing, puffing one's cheeks, etc. Thus, mimesis is a *direct articulatory imitation*. In Flaksman (2024), it is argued that the *place of articulation* of consonants and vowels is most significant for mimesis. For example, lip movements in SAMs are depicted by rounded vowels and labial (bilabial and labio-dental) consonants, cf. English ***mumb**le*, ***b**abb**l**e*, ***pou**t*, ***mw**ah*, and ***bu**ss.*

Simultaneous articulatory and acoustic imitation (1A + 1B) is also possible (it is termed "*iconic interference*" in the literature, see Davydova 2022). Thus, many SAMs have an acoustic component (e.g., imitations of laughter typically imitate the 'place' of laughter ('throat') by means of velar / glottal / pharyngeal consonants, and the pitch of the accompanying sound – by vowels of different pitch; additionally, repetitive nature of laughter is diagrammatically rendered by reduplication (full or partial) and/or by iterative RL-formatives: cf. English *ha-ha*, *he-he*, *ho-ho*, *giggle*, *cackle*; Old English *hliehhan* / *hlehhan* (> *laugh*), Gothic *hlahjan*). In Flaksman (2024), such words are classified as "mimetic" with an "acoustic component".

Indirect imitation requires a modality shift from any modality (visual, tactile, etc.) either to acoustic (2A words) or to kinaesthetic (articulation) (2B words).

Examples of *synaesthetic imitative words* of type ***2A*** are English ***zig-zag*** and ***flip-flop*** – visual impressions (multidirectional movement perceived visually; visual modality, dynamic) are rendered by speech sounds (vowels with diagrammatically contrasted acoustic characteristics and with fricative and stop consonants; audial modality). Thus, there is a modality transfer 'a rushing movement' → 'a rushing sound' / 'an abruptly ending movement' → 'an abrupt sound'.

Examples of synaesthetic imitative words of type ***2B*** are English ***bubb**le*, ***bump***, ***pom-pom***, and ***boob***. A round or bulky shape of an object (visual modality, static) is depicted by rounding of lips (an articulatory gesture, kinaesthetic modality). This rounding of lips is conveyed by labial consonants and rounded vowels (cf. Nivkh imitative words in Gruzdeva, this volume).

In different languages, 1A, 1B, 2A, and 2B imitative words can be *different parts of speech*. Onomatopoeic and mimetic words (1A, 1B) seem to be most frequent in languages across the globe (as their coinage does not require a modality shift). They can be both interjections/ideophones (*boom*! *achoo*!) and 'prosaic' imitative words – nouns, verbs, adverbs, etc. (*crash*, *mumble*). For further discussion – see Flaksman (forthcoming).

Synaesthetic imitative words (2A, 2B) are less frequent, and their distribution is language-specific. In some languages, they can be what is termed an "interjection" in European linguistic tradition (cf. *OED*) – a part of speech which lacks morphological markers and any syntactic functions. In languages with numerous non-integrated synaesthetic (as well as onomatopoeic and mimetic) imitative words (see Montebran; Guitang & Akumbu; Schaefer & Egbokhare, this volume), these words are specifically termed "*ideophones*".

As English lacks interjection-like imitative words which depict size, gait, movement, brightness, weight, intensity, etc., all the examples of synaesthetic imitative words in Table 1

are examples of integrated imitative words (verbs and/or nouns). In Indo-European languages (English, Russian), interjections are formed from such words either by conversion or by back-formation. English compensates for the absence of non-integrated synaesthetic imitative words ("ideophones") with large groups of words (mostly) non-imitative by origin which, nevertheless, convey sensory impressions; these words are termed "*phonaesthemic*" in literature (see Malysheva, this volume). Cf. ***gl****immer*, ***gl****itter*, ***gl****isten*, ***gl****ow* (visual impressions, static – light from a source or light reflected by a polished surface); ***sl****imy*, ***sl****ippery*, ***sl****eek*, ***sl****eazy* (tactile impressions); ***tw****itch*, ***tw****erk*, ***tw****irl* (movement; visual impressions, dynamic). In phonaesthemic words, only a part of the base (phonaestheme) is iconic; therefore, they are only partially imitative. Phonaesthemic iconicity (as well as synaesthetic ideophones) is also language-specific.

Phonaesthemic words bridge *performative iconicity* (imitation, iconicity by coinage, creation of a word 'from scratch') and *perceptual iconicity* (iconicity 'in the eye of the beholder', something the form of which is perceived to be similar to its meaning). Perceptual iconicity includes *sound symbolism* – iconicity of singular phonemes, always synaesthetic, e.g., the perceived 'likeness' of front vowels and small size (see Ohala 1994).

The distinction between *performative* iconicity and perceptual iconicity implies that *not all imitative words are iconic*, *and not all iconic words are imitative*. Thus, relatively recently coined words like *ha-ha*, *giggle*, or *pop* are both imitative (coined as iconic) and iconic (that is, perceived as such – see the ratings in Winter et al. 2023). Older and/or borrowed onomatopoeic words (*laugh* /lɑ:f/, *kiwi*, *cloak*) are imitative but not iconic anymore (to be discussed further in Section 2). On the other hand, some words from Winter et al. 2023 – like *gore*, *dung*, or *woolly* – rate very high in (perceived) iconicity, just as *giggle* does (it means that they are iconic by perception) although they are not imitative (that is, they were not iconic *by origin*). For further discussion – see Flaksman (forthcoming).

The majority of words from phonaesthemic groups are iconic (score high in Winter et al. 2023) although they are not imitative (see Malysheva, this volume). Also, as in phonaesthemic words only the phonemic cluster (*sw-*, *gl-*, *tw-*) is iconic, phonaesthemic sound symbolism is closer to sound symbolism – *bouba-kiki* effect, see Ramachandran & Hubbard 2001) where *one* phoneme/sound is associated with *one* (very generalized) meaning – than to onomatopoeia/mimesis.

Sound symbolism can be considered is an instance of metaphoric iconicity (see *Introduction* to this volume). But whereas by phonaesthemic sound symbolism, the meaning is shared by the member of the group, by sound symbolism, the meaning is shared by words in the entire lexicon. For further discussion – see Flaksman (forthcoming).

Non-integrated imitative interjections/ideophones tend to exhibit rare and unusual traits which make them '*marked*' (Dingemanse 2017) and, therefore, '*expressive*' (Voronin 2006 [1982]) and, thus unmistakeably iconic. These 'marked' (non-systemic, non-arbitrary) traits (listed in Table 2) are exceptionally prominent in languages where non-integrated (onomatopoeic, mimetic, and synaesthetic) imitative interjections/ideophones are numerous; although in languages like English they are attested as well (see Table 2). This especially concerns trait (9) – in some languages (like Gizey, see Guitang & Akumbu, this volume) imitative words may even acquire their unique syllable structure by analogy.

This article is concerned with traits (2), (3), (6), and, partially (8), as unusual phonotactics (6) which also includes rare combinations of phonemes (2), (3), (8) can be measured by means of Surprisal (see Section 3).

Table 2: ‘Marked’ traits of imitative words

N	‘Marked’ traits	Examples in literature	Examples in English
(1)	rare phonemes or sounds otherwise non-existent in the phonemic inventory	[b^{h}] in Pastaza Quichua ideophones (Nuckolls et al. 2016: 96)	***tch**ek* [a palatal click]
(2)	expressive vowel lengthening	Kisi *h**ã-ã-ã-ã-ã**⋯* ‘for a long time’ (Childs 1994: 180)	occasional *m**oo-o***, *b**aa-a***
(3)	expressive consonant lengthening	Ilocano *tara**tt**at* [ta.rat.tat] ‘sound of typing’ (Rubino 2001: 305))	OE *þo**dde**tt**an* ‘to strike’
(4)	expressive ablaut (vowel change)	Pacoh *t**i**p-t**u**p* ‘sound of two people pounding rice alternately’ (Watson 2001: 399)	*fl**i**p-fl**o**p*
(5)	expressive consonant change	Russian *динь* [**d**^{j}in^{j}] vs. *дзинь* [**d**^{j}**z̄**^{j}in^{j}], both sounds of tinkling	*flo**b*** vs. *flo**p***
(6)	violation of phonotactic rules	Finnish ***kl**aasuta* ‘stumble’, with a prohibited initial consonant cluster (Mikone 2001: 227)	***vr**oom* ***thw**ack*
(7)	expressive metathesis	Ewe *dzahlii / hlidzaa* ‘tough and plumpy’ (Ameka 2001: 31))	palindromes ***p**ee**p**, **p**o**p***
(8)	reduplication (partial and full)	Emai *tókó / tótókó* (sb.) ‘mushy’ (Egbokhare 2001: 89)	*ding-ding*, *cuckoo*
(9)	‘Expressive’ morphology (affixes attached exclusively to imitative bases) and / or unique structure	*kireb* ‘wave crash’– ***k**akreeb* ‘sound of crashing waves’ (Rubino 2001: 309)	***ka**-boom*, ***ker**splash*

The ‘marked’ traits listed in Table 2 originate from two intentions: (1) to find a speech sound with acoustic or articulatory characteristics which match those of the imitated natural sound / non-acoustic phenomenon best (hence, marked traits 1-5; the quantity and quality of the selected speech sounds are paired with those imitated regardless of the system restrictions), and (2) to replicate a complex acoustic (non-acoustic) phenomenon segment-by-segment (hence, marked traits 6-8; the repetitive and / or contrastive sequences of natural sounds are replicated with repetitive and / or contrastive sequences of speech sounds on the expense of (arbitrary) phonotactic rules). Thus, ‘markedness’ positively correlates with precision of iconic imitation and negatively correlates with system-integration (see Dingemanse 2017).

The examples above also demonstrate how adjustable the form of ideophones / iconic interjections is. A slight change in the implied meaning (a sound of a higher pitch) automatically triggers a slight change of form (a speech sound with a higher pitch). Therefore, any form changes in iconic words are *meaningful*. This concerns integrated imitative words as well. Cf. *plip* and *plop*. On the other hand, such changes are not entirely detrimental to the meaning of imitative words (as they are for non-imitative). Both *plip* and *plop* are onomatopoeic words imitating sounds. But cf., for example, similar substitutions in non-imitative words and their effect on their meaning: Finnish *muta* ‘mud’ vs. *muuta* ‘other’, Spanish *pero* ‘but’ vs. *perro* ‘dog’, English *pan* vs. *pin*, English *pad* vs. *pat*, etc. Any change in quality of the speech sounds triggers a *complete* change in the meaning of non-imitative words (in languages such as Finnish or Spanish, changes in quantity are meaning-distinguishing as well). For more on this, see Flaksman (2024: 57).

A simple substitution test as demonstrated above proves that phonemes in onomatopoeic (broader: imitative) words are not just mere building blocks. Voronin (2006 [1982]) suggested that phonemes (or rather more broadly *phonotypes*) in imitative words have an additional, *imitative* function, a function of reference to the denotatum by way of homogeneity. That is, phonotypes in imitative words (in contrast to non-imitative words) have a function of *iconic reference* to their denotata. For example, the 'plosive' phonotype, where plosives (characterized by an *abrupt* blockage of airflow) iconically map abruptness of the imitated natural sounds (clapping of hands, knocking, tapping, etc.).

Therefore, loss or significant (diachronic) changes in phonotypes of imitative words or any changes in the sequences of segments in imitative words diminish their iconicity.

1.2 (Language-specific) restrictions on iconic coinage: *biological*, *systemic*, *chance*

Sound imitation is a *cognitive* process. The denotatum of an onomatopoeic word (a sound) just like the word which imitates the denotatum itself is physical (both are sound waves with certain acoustic characteristics). However, the process of sound imitation is cognitive, and there are numerous distortions and restrictions on the way from a sound to an onomatopoeic word, as shown step-by-step as follows:

> $_{\text{physical}}$[(1) hearing a natural sound] → $_{\text{cognitive}}$[(2) dividing it into segments → (3) choosing the most salient segments for the representation of the sound → (4) choosing the phonemes from the phonemic inventory which (once pronounced in speech) have acoustic characteristics similar to those of the salient segments → (5) arranging these phonemes into a sequence similar to the sequence of the imitated sound → (6) adjusting the word according to the phonotactic rules of the language → (7) for synthetic, polysynthetic, and agglutinative languages: adding inflexional and derivational affixes (if not an interjection/ideophone)] → $_{\text{physical}}$[(8) pronouncing the word]

As it can be seen, there are several weak links in this chain where the desired iconicity effect can be restricted considerably either by system-imposed factors (4)-(7) or by biological or (1), (8), or chance restrictions (2), (3), (5). There is need to determine where and how it happens.

Biological (objective) restrictions come at both ends of the chain – these are links (1) and (8). There is a limited range of sounds human ears can possibly hear (1). Likewise, there is a limited number of sounds one can possible produce (8), since humans are limited by the configuration of our speech organs: position of glottis, vocal cords, etc. One cannot *pronounce* a clap of thunder or a dog's growl.

System (arbitrary) restrictions are imposed on imitative words by the language in which they are coined. Language (which is an arbitrary system of signs) affects links (4) 'phonemic inventory', (6) 'compliance with phonotactic rules', and (7) 'adding morphological markers'. For example, onomatopoeic words beginning with /θ/ (English *thwack*, *thump*, etc.) are impossible to coin in German as German lacks this consonant. Similarly, English cannot use different tones in single imitative words (not the phrases), as tone is not a meaning-distinguishing feature in this language (but it is in, for example, Chinese or Vietnamese). Also, syllable structure restrictions play a major role in limiting iconicity in imitative words. For

instance, words like English *scratch* or *thwomp* would be impossible to coin in languages with prohibited initial or final consonant clusters (such as Spanish or Chinese). Although, as we have just illustrated (Table 2) such restrictions are sometimes violated. Morphological markers (in lexicalized imitative words) (7) are unique to any language and thus also indisputably arbitrary.

Chance (arbitrary) restrictions are restrictions which are neither explained by human biology or by any particular linguistic factors. These affect the following links of the chain described above: (2) 'dividing the sound we hear into segments', (3) 'selecting the most salient trait for imitation', and (5) 'arranging the phonemes into a 'correct' sequence'. Thus, English *oink* and *grunt* both imitate pig sounds, although different pig sounds. The two words differ because the imitate *different features* of the same denotatum (thus, the linguistic means of imitating them differ as well). Such differences become even more noticeable by comparison of words from different languages. Voronin (2006 [1982]: 185) formulated this paradox in a form that he termed a "*multiple-nomination law*". It states that "one and the same concept may have different (iconic) motivations for nomination and vice versa – one and the same motivation for nomination may be encountered in several concepts" (translated by the first author). Thus, a dog's bark in different languages is conveyed by onomatopoeic words with different motivations for nomination: cf. English *bark*, German *bellen*, Swedish *skälla*, Norwegian *gjø*, etc. (Shamina 2017: 325), cf. also Russian *лаять* [ˈła(ɪ̯)ɪtʲ] and *гавкать* [ˈgafkətʲ]. Thus, different acoustic traits of the imitated concept (a dog sound) are being imitated. Conversely, the same acoustic trait (e.g., a high-pitched sound) may be a foundation of such semantically dissimilar onomatopoeic words as, for example, *peep*, *beep*, *chirp*. As any sounds are complex acoustic entities and none of them are identical (there are no two identical claps of thunder, and no two identical cat mewls), even one and the same denotatum (for example, a revving engine of a particular car) can be heard and, therefore, transmitted differently by two different people (cf. the data from Edmiston et al. 2018).

All these restrictions are applied imitative words at *the moment of their coinage*. As one can see, iconic imitation is by no means 'wild and free'. It is limited by a number of (arbitrary, biological, and chance) constraints. Therefore, all imitative words are only *partly* iconic.

Roman Jakobson (1965: 26) discussed exactly this matter in relation to Peirce's theory of signs. He claimed that one of the characteristic traits of Peirce's semiotic classification is a "shrewd cognizance that the difference between the three basic classes of signs is merely a difference in relative hierarchy" (ibid.). This idea was also reflected in the concept of the *gradability paradox*. It is "a circumstance according to which signs may be, variously, more or less iconic depending upon the degree to which they share characteristics of their referents" (Anderson 1998: 335). There is no such a thing as "ideal" icon. An ideal icon is not a sign – it is but a duplicate, a clone of its Object (Flaksman, forthcoming).

Thus, imitative words are only partly iconic and largely arbitrary (language-specific) already at the moment of their coinage. This article will show how language-specificity increases with time.

2. De-iconization: Gradual loss of iconicity caused by language change

In this section we will examine how onomatopoeic words lose their iconic (imitative) quality over time. The process is termed "*de-iconization*" (Flaksman 2014; see also Flaksman 2015,

2024) and can be divided into two stages: (2.1) system-integration and (2.2) change with(in) the system.

3.1 De-iconization by system-integration (lexicalization of ideophones / imitative interjections)

Imitative interjections / ideophones (*bow-wow*!, *zzz*!, *achoo*!) are words which are more or less self-evident both in the contexts of communication. They have a situational ('here-and-now') meaning. They are "performed" rather than conveyed and are often accompanied by gesture (Samarin 2001). Their evident iconicity is, in many cases, enhanced by non-systemic marked traits (see Section 2.1), which makes them highly expressive. It is no surprise that non-integrated imitative words appear most frequently in colloquial speech, speech directed to children (Ivanov 2022), slang (Kuzmich 1993), comic strips (Taylor 2007), and (rural) dialects (Samarin 2001, Shvetsova 2011, Vershinina 2013). However, such non-lexicalized imitative words are often poorly integrated syntactically. They are holophrastic (and often accompanied by body language and gesture, cf. Armstrong & Wilcox 2007). Consider, for instance, the following examples from the OED [underlining by the authors]:

(1) 1977 *Sounds* 9 July 19/2 Onstage we just go like, woosh!
(2) 1979 R. Blythe *View in Winter* i. 64 He was a man with a catapult. He'd knock a pheasant down—*zonk*!
(3) 1989 *William Tell Graphic Novel* 34 *Paff*! I've got you now, scum! *Smack*!
(4) 1992 *Whizzer* June 12 Grrr! The manners in this family are disgusting!
(5) 1999 *Guardian* (Nexis) 19 July 16 Ping! 'Good evening, ladies and gentlemen, this is your captain speaking. Air India regrets the delay to flight 747 to Rome and London, which is due to the unfortunate demise of one of our passengers.' Ping! Plonk-plonk.
(6) 2005 M. J. Daley *Space Station Rat* x. 94 Flashes of laser fire lit the room. *Zizz*. *Zizz*. The wall above his bed exploded in a shower of hot sparks.

Ideophones/imitative interjections either form a sentence of their own, or are introduced by words 'go', 'do', or 'say'. Also, they can 'interrupt' the sentence; then they are introduced by commas or *n*-dashes in writing, as illustrated in examples (1)–(6). Such words also often have a different intonational contour, have no conventional morphology and have no syntactic relation to other members of the sentence (Voeltz et al. 2001). Thus, they are 'alien' elements in the language system. But once there is a necessity to integrate those imitative interjections (and ideophones – see McGregor 2001; Akita et al. 2020) into a sentence, to use them in a context which is not depictive but descriptive (referring to past and future, visible and invisible objects, and actions, etc.), things change. Conversion of ideophones/imitative interjections into content words (verbs, nouns, adverbs etc.) entails the loss of these non-systemic traits (McGregor 2001; Dingemanse & Akita 2017; Carling & Erben Johansson 2014; Flaksman 2015, 2024). Thus, system-integration is accompanied by a dramatic drop in markedness (Flaksman 2015; Dingemanse 2017; McGregor 2001) and, consequently, in iconicity. Also see Moreno-Cabrera (this volume).

2.2. De-iconization by further language change: differentiating the SDs

Further drop in the number of (universal) iconic traits can be explained by the in-built structural mechanisms of language change. Integrated imitative nouns, verbs, adjectives do not differ

from the rest of the (non-iconic) lexicon in the way they operate in the language (Flaksman 2015). Both phonetic and semantic development add to the dissimilarity between form and meaning.

2.2.1 Form development

Regular (as well as sporadic) sound changes gradually lead the loss of traits necessary for imitation. Consider, for example, English *bleat* which has undergone a series of vowel changes (ɛ: > e: > i:). The original vowel (/ɛ:/) had acoustic characteristics better suited for the imitation of the cry of a goat or a sheep than a close front vowel /i:/ (with its higher pitch). The ɛ: > e: > i: change took centuries to complete and was triggered by purely automatic processes (it was a part of a chain shift which affected all Middle English long vowels). It occurred in all words containing /ɛ:/ at the end of the Middle English period (*sea*, *beat*, *treat*, etc.). But only in onomatopoeic words it led to the decrease in iconicity. This is explained by the fact that phonemes in onomatopoeic words have a dual function – that of being building blocks of words and that of rendering the acoustic characteristics of the denoted sound (see Section 1.1).

Many consecutive sound changes can have a cumulative effect and remove the iconic link between form and meaning entirely. However, not all sound changes have an equal effect on onomatopoeic words (Flaksman 2018). If these changes do not alter the phonotype or affect phonemes playing only a secondary role in imitation, they are not *phonosemantically significant* (ibid.). True, there are exceptions – onomatopoeic words like *cuckoo* which resist sound changes, but these words constitute less than 1% of the vocabulary (for English) (Flaksman 2015). Such *phonosemantically inert* words are either non-integrated imitative interjections or words which have not yet developed any additional meanings. If they do, they change according to the sound laws affecting the language (cf. *cuckold* 'a husband of an unfaithful wife' which is not phonosemantically inert) (Flaksman 2013).

Concerning the present discussion, we suggest that regular sound changes of the English language have a cumulative negative effect on markedness of imitative (onomatopoeic, mimetic, synaesthetic) words and, thus, lead to the decrease in Surprisal. We suggest (as it will be illustrated in Section 3 in detail) that English imitative words in time became more like the general non-imitative lexicon, and, therefore, more language-specific.

2.2.2 Meaning development

It should be noted, however, that meaning development also has a dramatic effect on iconicity. Semantic development propels through metaphor ('sound made by object-A' > 'sound made by object-B') and metonymy ('sound' > 'the source of the sound' or 'to act with the sound') (Flaksman 2015, 2024: 87). For example, English *clip* (a borrowing from Old Norse *klippa*) was an imitation of an abrupt sound (OED). Then it developed the meaning 'to cut something with an abrupt sound', then just 'to cut' and, finally 'something cut' (for example, a part of a film). Thus, *clip* in the Present-Day English is no longer onomatopoeic as it has no meaning related to sound. Thus, an imitative word first becomes polysemous and then it may even lose the original meaning (the one directly related to sound/other sensory imagery). Thus, this aspect also must be taken in account.

2.2.3 Method of diachronic evaluation of imitative lexicons (gradation by SDs)

Integration and form and meaning changes do not happen simultaneously. To differentiate the stages of de-iconization, the first author has introduced the method of diachronic evaluation of

imitative lexicons (Flaksman 2015, 2024: 74). It involves not only establishing the word's degree of phonetic, morphological, and syntactic integration but also revealing the regular sound changes a word has undergone (and whether these sound changes were phonosemantically significant), as well as registering the semantic shifts (and whether the word still retains its original (sound/SAM-related) meaning).

Altogether four stages of de-iconization (SDs) are distinguished (summarized in Table 3). The method of diachronic evaluation is potentially applicable to all modern and even reconstructed and ancient languages such as Gothic (Flaksman 2023).

Table 3: De-iconization scheme – from (Flaksman 2015: 120; 2024: 75)

SD	***A brief explanation***	***Example***
SD-1	poorly integrated (syntactically and morphologically) imitative interjections / ideophones	*bzz!*, *zzz!* *tlok-tlok*
SD-2	imitative nouns, verbs, adjectives; well-integrated and expressive at the same time	*buzz*, *screech*, *cuckoo*
SD-3a SD-3b	imitative nouns, verbs, adjectives which have undergone either (a) form or (b) meaning changes, their iconicity considerably lessened	*bleat* *clip*, *cliché*
SD-4	imitative nouns, verbs, adjectives both form and meaning of which have changed to such extent that they are iconic only by origin	*gargoyle* *cuckold*

The 1317 words from Flaksman (2024) used in this study were classified according to their SDs.

3. Iconicity and Surprisal

Phonemic bigram Surprisal was calculated by cross-referencing the SUBLEX-US corpus – a corpus consisting of over 44 million lexemes (Brysbaert & New 2009) – with the CMU *Pronouncing Dictionary* (Weide 1999). Bigram Surprisal is the percentage chance of one phoneme following another that has undergone a negative logarithmic transformation (base 2). Average phonemic bigram Surprisal is the sum total of all bigrams in a word divided by the number of bigrams.

Hence, all words have a score according to the transitional probability of the speech sounds they are made up of. This was cross-referenced with an existing iconicity experiment (Winter et al. 2024) where American English-speaking participants rated words according to how much they sound like their meaning. This was then cross-referenced with the diachronic iconicity dataset classified according to their SD (1317 words, see Section 2); 486 samples found a match, the remaining samples were discarded.

3.1 De-iconization stage and Surprisal

In exploring the relationship between iconicity and phonemic surprisal (Surprisal), we conducted a series of statistical analyses to better understand the underlying dynamics. A logistic regression model was employed to investigate the influence of iconicity scores on the diachronic (SD) levels. The likelihood ratio test, which compared the full model including

iconicity scores as a predictor to a null model with only the intercept, yielded a likelihood ratio statistic of 84.192 with a p-value of less than 0.001. This result indicates a statistically significant effect of iconicity scores on SD levels, suggesting that higher iconicity is associated with lower SD levels. Furthermore, a simple linear regression analysis was conducted to examine the relationship between iconicity ratings and average Surprisal. The analysis revealed a significant positive association between these two variables ($F(1, 13643) = 243.6$, $p < 0.001$, $R^2 = 0.018$). This suggests that as iconicity ratings increase, there is a corresponding increase in average Surprisal, albeit with a modest effect size. These findings contribute to our understanding of how phonemic patterns and iconicity interact, providing insights into the cognitive processing of language.

3.2 SD-ratings and iconicity ratings in Winter at al. (2023)

Additionally, an ordinal logistic regression analysis verified a correlation ($p < 0.001$) between iconicity ratings (Winter et al. 2023) and de-iconization stages outlined in Section 2. The iconicity dataset from (Winter et al. 2023) is the result of the psycholinguistic experiment on *perception* of words as iconic. SD-ratings, on the other hand, show the degree of 'distortion' imposed on iconicity by language change. In their experiment, American English-speaking participants rated 14,776 words on Likert scales according to how much each word "sounds like" its meaning (thus, *perceptual iconicity* was tested, see Section 1.1). Out of the master dataset, 13,703 words matched the iconicity dataset.

4. Discussion

Our findings suggest that the de-iconization process makes words less phonologically 'marked' as they become less iconic. Because they have a form/meaning resemblance, iconic words are easier to process which suggests that de-iconization increases the cognitive difficulty of processing such words. The loss of phonological markedness and, specifically, an increase in bigram transitional probability, makes these word more similar to non-imitative words of a language. Increased transitional probability offsets at least some of the cognitive advantage loss through the de-iconization process.

One shall add that iconic coinage – which is continuous and never ceasing – is only counter-balanced by de-iconization (Flaksman 2017, 2024). Two sides of language change – regular sound changes and semantic development – diminish iconicity in a subtle way, yet their effect – seen in retrospective – is tremendous. The study of de-iconization in the lexicon gave rise to the *iconic treadmill hypothesis*. According to this hypothesis, imitative words overtime lose their iconicity and evolve into words with purely arbitrary sound-meaning correlation, and this process, in turn, determines new iconic coinage (Flaksman 2017: 18). Thus, iconicity is ever-present in human language.

Conclusion

The study has illustrated how imitative interjections/ideophones lose their 'rough edges' as time like a giant wave polishes them into all-too unobtrusive pebbles. Sound changes taking place in a language make imitative words less 'marked' (which agrees with Dingemanse 2017

and Carling & Erben Johansson 2014) and more predictable from a phonological point of view. This agrees with the smooth signal redundancy hypothesis (Levy 2008).

Imitative words are most iconic at the moment of their coinage, but even then, their iconicity is restricted by a number of biological, systemic, and chance factors. System integration (phonological, morphological, and syntactic) which happens when ideophones/imitative interjections change into other parts of speech adds to the iconicity loss. Further development of imitative content words (nouns, verbs, adjectives) is governed by mechanisms of (phonetic and semantic) change. Thus, the longer imitative words exist in a language, the less iconic and less 'marked' they become. On a phonological level, this leads to a decrease of the Surprisal effect and in increase of transitional probability. Transitional probability positively correlates with de-iconization and negatively – with iconicity.

The balance between iconicity and arbitrariness is constantly shifted towards arbitrariness yet iconicity never disappears from the language completely as new imitative words are being coined to violate the existing arbitrary restrictions.

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Asymmetry among vocal sounds for non-vocal sound experiences: An Edoid case

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We investigate features associated with the phonological character of ideophones in Emai (ISO 639-3), an Edoid language. Follow up discussion emphasizes related morphological and syntactic properties. Many ideophones denote sound images where two syllabic shapes are basic: CV(V) and CV(V)CV. Their initial consonants (C_1) distribute unevenly as to place of articulation. C_1 privileges velar consonants; alveolar consonants are highly dispreferred. In CVCV shapes, C_2 distributes nearly equivalently among velar and alveolar sounds. Consonants also constrain their voice/voiceless dimension. Some ideophone pairs contrast in voice quality of C_1, as the voiced member signals a greater degree of loudness. But other ideophones show only a voiceless C1; their voiced counterpart surfaces as an extant verb. Vowels in Emai ideophones are not similarly constrained as to their qualities. But after C_1, vowels often pair (V_1V_2). When they do, V_2 appears to be a remnant verb suffix of perfective aspect. We conclude by examining residual morphological and syntactic features of Emai ideophones. Overall, our data support recent views that sound symbolic correlations are better sought relative to broad structural correspondences rather than a single acoustic feature.

Keywords: *onomatopoeia, ideophones, velar consonants, liquids, Emai, Edoid*

Introduction

Onomatopoeia identifies a word where vocal sounds in human languages imitate, resemble, or suggest non-vocal sounds of the natural world. Sound symbolic words of like character are called ideophones (Akita & Dingemanse 2019; Childs 1994; Voeltz & Kilian-Katz 2001), which have been of interest for some time to Africanists (Werner 1919; Doke 1935; Westermann 1927; Samarin 1971). Dingemanse (2011: 25) defines them as "marked words that depict sensory imagery".

Over the years, accumulated semantic data from many languages has awakened typological interest in ideophone systems. One manifestation of this is a cross-linguistically constrained implicational hierarchy of ideophone meanings (Dingemanse 2012; Akita & Dingemanse 2019).

SOUND > VISION > OTHER SENSES > INNER COGNITIVE STATES

This hierarchy encodes the ease with which ideophones in different sensory domains map to language and become acquired by language learners. It also expresses cross-linguistic variation in the way that ideophones from different sensory domains are constrained by morphosyntax. Sound ideophones tend to be mapped earlier, learned earlier, and constrained less in their morphosyntactic behavior than those associated with vision, other sensory perceptions as well as inner cognitive sensations.

Employing data from an under-analyzed Edoid language of Nigeria, we investigate aspects of the phonological, morphological, and syntactic character of ideophones that refer to

sound. Phonological features are evaluated in Section 1, while Section 2 concerns residual morphological and syntactic qualities. The last section (Conclusion) concludes our assessment.

1. Emai sound ideophones

Emai data derive primarily from fieldwork that resulted in over 30 hours of oral narrative texts from village storytellers as well as from elicitation follow up. The Emai language is SVO with little segmental inflection, extensive complex predicate shapes that profile verbs in series or verb plus preposition frames, and grammatical and lexical tone. Its sound inventory consists of twelve-vowels of like-length (seven oral, five nasal) and 27 consonants. The latter combine place (seven), manner (five), and voice (two).

In our database (Schaefer & Egbokhare 1999, 2007), a clear majority of ideophones (70 plus) denote sound images. They occur in texts associated with oral tradition, including prose narratives, riddles, and proverbs. Rarely do ideophones occur in conversation, at least in the native-speaker experience of the second author.

1.1 Linguistic properties of sound ideophones

Sound ideophones in Emai are constrained by grammatical mood. Consistent with many other languages in Africa, Emai ideophones predominately appear in affirmative, declarative sentences. Although this may be an artifact of our interest in documenting the language of oral tradition, it may also signal that the ideophones in our sample emerged relatively recently in the historical evolution of Emai's lexicon. Nonetheless, there is a specific construction that associates with all sound ideophones. It consists of an intransitive clause with the verb *hɔn* 'hear,' which is marked for perfective aspect, a second person singular pronoun as subject, and a clause final ideophone. These are illustrated in (1a-d). The *hɔn* construction is limited to sound ideophones; it does not appear with visual or experiential ideophones, where *miɛ* 'to see, experience' is employed in a similar constructional capacity, e.g., *ú míé-í xùìén* [2SG experience-PFV sharp.twist] 'You sensed sharp twisting.'

(1) a. *ú* ↓*hɔ́n-í* *pèú*.
2SG:DST PST:hear-PFV smacking.sound
'You heard a smack.'

b. *ú* ↓*hɔ́n-í* *gúɔ́*.
2SG:DST PST:hear-PFV jingling.sound
'You heard jingling.'

c. *ú* ↓*hɔ́n-í* *gèì*.
2SG:DST PST:hear-PFV banging.sound
'You heard a banging from a gun.'

d. *ú* ↓*hɔ́n-í* *pɛ́ùn*.
2SG:DST PST:hear-PFV whizzing.sound
'You heard a whizzing sound.'

Emai sound ideophones evoke vivid scenes through their imitative phonetic properties. Examples include the smacking sound coded by *pèú*, the jingling sound of *gúɔ́*, the banging sound of *gèì*, and the whizzing sound of *péùn*. Each is illustrated in a clausal format in (2), where ideophone translations into English are at best suggestive of the respective sounds. Native speakers of Emai most often find translations such as these lacking in expressive value.

(2) a. *ɔ́* *↓fí* *ɔ́í* *émí* *vbí* *áwɛ́* *pèú.*
3SG:DST PST:hit:PFV 3SG thing LOC legs smacking.sound
'He smacked her with something on the legs.'

b. *ɔ́* *↓kú* *íxùèxúɛ́* *ísì* *ɔ̀í* *gúɔ́.*
3SG:DST PST:cast:PFV divining.seeds ASS 3SG jingling.sound
'He cast his divining seeds with a jingle.'

c. *ɔ́* *↓fí* *ɔ̀i↓sí* *gèì.*
3SG:DST PST:project:PFV gun banging.sound
'He shot the gun with a bang.'

d. *ɔ́lí* *áfìánmí* *↓tín* *fì* *á* *péùn.*
ART bird: DST PST:fly:PFV disperse ITV whizzing.sound
'The bird flew away in a whiz.'

Emai ideophones of sound are constrained as to their phonetic form. They assume two basic syllabic shapes: CV and CVCV with variants being CVV and CVVCV, respectively. Word initial consonants (C_1) in these syllabic shapes distribute unevenly as to place of articulation. C_1 privileges velar consonants [g, k, ɣ, x, gb, kp]. Less favored are labials [b, p, f, v, w, m] followed by alveolars [d, t, s, č, l, r, n].

The following three tables list Emai CV ideophones where the consonant is either velar, labial or alveolar.

As indicated above, velar forms dominate; they are shown in Table 1.

Table 1: CV sound ideophones where C_1 is velar

Ideophone	**Meaning**
gèì	'sound from banging of an exploding gun'
gɔ́	'sound from a forceful, jabbing contact'
gúɔ́	'sound from divining seeds jingling as hit ground one after the other'
gùòó	
gùú	'sound from crashing for contact event'
gbàán	'sound from air whooshing out of a body when stabbed'
	'sound from a smack of objects'
	'sound from thunder cracking'
gbèú	'sound from loud scolding or shouting
gbɛ̀	'sound from thunk of an arrow on its target'
gbì	'sound from thump of a falling object'
gbìó	'sound from compact object smacking the ground'
gbìɔ́n	'sound from cracking of objects in a hitting event'
gbó	'sound from gulping swallowed food'
gbòí	'sound from the thud of dry wood in a hitting event'

gbòó	‘sound from a snap in a plucking event’
káé	‘sound from intensely loud splat’
kái	‘sound from hard objects hitting in high pitched ping’
káín	‘sound from hard objects hitting in high pitched ping’
káó	‘sound from sharp, ringing contact between two hard objects’
kúá	‘sound from sharp pitched pinging of contact between two hard
kùén	objects’
xùó	‘sound from pouncing on someone’
kpàán	‘sound from a sudden snap in a breaking event’
kpái	‘sound from whooshing of a deep cut’
kpìó	‘sound from small objects smashing’
	‘sound from sharp snap in a separation event’
kpíɔn	‘sound from a crack during a hitting event’
kpóò	‘sound from sudden snatching in a pick-up event’
	‘sound from gulping to a great depth’
	‘sound from the loud bang of a gun’

Labial forms, presented in Table 2, follow.

Table 2: CV sound ideophones where C_1 is labial

Ideophone	**Meaning**
bói	‘sound from the pop of a pulling out event’
bòó	‘sound from a sudden, sharp thump in a hitting event’
	‘sound from a sudden, loud burst of tears’
bèú	‘sound from a sudden, sharp smack a hitting event’
fáà	‘sound from a light object whistling through the air’
fíín	‘sound from a high-pitched, sizzle through the air’
fáò	‘sound from a light object zinging through the air’
pèú	‘sound from a sudden, sharp smack in a hitting event’
	‘sound from a cracking into tears’
péùn	‘sound from a whizzing by object’
póí	‘sound from the pop of one object pulled from another’
pòó	‘sound of an intense boom in a separation event’
	‘sound of intense burst of tears’
váà	‘sound from a light object whistling through the air’
váò	‘sound from an object zinging through the air’
	‘sound from cracking into tears’
váùn	‘sound from a large object zooming through the air’
véùn	‘sound from a small projectile whistling through space’
vóò	‘sound from a fast object whooshing through space’

Alveolar-initial ideophones are found in Table 3. Our orthographic examples retain <n> after vowels as a signal of nasalization.

Table 3: CV sound ideophones where C_1 alveolar

Ideophone	**Meaning**
dè	‘sound from a thump in a jumping event’
dì	‘sound from a boom in a hitting event’

dìì	‘sound from rumble of thunder’
dùé	‘sound of air rushing out of the body’ ‘sound from a forceful smash in a hitting event’
sùɛ́	‘sound from thrashing about in a jumping event’
tàán	‘sound from dinging of palm kernels in cracking event’
tèí	‘sound from pop of a submerged object that surfaces’

As seen across Tables 1-3, C_1 use of velar sounds is quantitatively more frequent than labial or alveolar articulations. Overall percentages for all C_1 positions in our ideophone database are 61.4% for velar, 25.7% for labial, and 12.8% for alveolar. Alveolar seems highly dispreferred for initial consonants of sound ideophones compared to velar and labial. No further correlations between C_1 sound types and particular semantic meanings appear evident.

In contrast, selection of C_2 elements in basic CVCV syllabic profiles pattern differently. C_2 position in CVCV distributes more evenly for the places of articulation velar and alveolar. While velar continues to dominate (52.3%), alveolar is nearly equivalent (46.6%). There are no C_2 position bilabial sounds. Example CVCV ideophones where velar sounds occur as C_2 are shown in (3).

(3) a. *bòké* ‘sound resulting from pecking of a bird’
b. *gùàkó* ‘clashing sound resulting from forceful contact’

In (4) ideophones are presented where C_2 is alveolar.

(4) a. *gèdè* ‘sound of canon explosion and its echo’
b. *gbìdì* ‘sound resulting from alternate ends of a stick hitting the ground’

Moreover, a full 90% of alveolar C_2 forms are liquids, either [l] or [r]. Sample ideophones of this nature include the forms in (5).

(5) a. *gbíólò* ‘zipping sound resulting from an object taking off quickly’
b. *gbíìrí* ‘sound of sudden, vigorous sneezing activities’
c. *kpóló* ‘swishing sound resulting from an entering activity’

A more comprehensive listing of basic CVCV ideophones and their double vowel variants, CVVCV and CVCVV, are displayed in Table 4.

Table 4: Sound ideophones with basic syllabic profile CVCV and related CVVCV / CVCVV

Ideophone	**Meaning**
bòké	‘sound from a bird pecking’
gèdè	‘sound from echo of an exploding canon’
gùàkó	‘sound from forceful contact event of clashing’
gùòɣó	‘sound from contact event of crashing’
gbìdì	‘sound from alternate ends of a stick hitting the ground’
gbíìrí	‘sound of sudden, vigorous sneezing event’
gbíólò	‘sound from an object zipping off quickly’
gbíórò	‘sound from an object zipping off’

gbóló	‘sound of an echo from a hitting event’
kpòhíó	‘sound from one object gouged out of another’
kpóló	‘sound from an entering event of swishing’
pòró	‘sound of intense separation event’
rììgùòó	‘sound of objects crashing into each other’
tòbói	‘sound of heavy object swooshing into water’

Emai sound ideophones are not limited to the basic syllabic profiles CV and CVCV. They also occur as reduplicated or triplicated expressions. Reduplicated ideophones appear in Table 5.

Table 5: Ideophonic forms with a reduplicated profile

Ideophone	**Meaning**
bòóbòó	‘sound from a sudden, sharp thump in a hitting event’
búɣábúɣá	‘sound from fluttering wings in a beating event’
gùàgúgùàgú	‘sound of slow whooshing for beating wings’
gbólógbóló	‘sound of an echo from a hitting event’
ɣìrìɣìrì	‘sound of dirt sloshing in the air’
kùénkùén	‘sound from a breaking event by snapping’

Triplicated ideophones are listed in Table 6.

Table 6: Ideophonic forms with a triplicated profile

Ideophone	**Meaning**
dúgbèrèdúgbèrèdúgbèrè	‘sound from drumming’
gbágbágbá	‘sound from slapping wood’
gbégbégbé	‘sound from smacking a drum’
gbógbógbó	‘sound of a thud from dry wood hitting ground’
gbólógbólógbóló	‘sound of an echo from a hitting activity’
kpíkpíkpí	‘sound of intense wing fluttering’
púpúpú	‘sound from vigorous flapping of wings’
vìrìvìrìvìrì	‘sound from object sloshing through the air’

There are also some Emai ideophones that are multi-syllabic but do not exhibit morpheme reduplication or triplication. Instead, they exhibit a basic CVCVCV structure or a variant where a V position is realized as VV, as indicated in Table 7.

Table 7: Sound ideophones with a basic CVCVCV profile

Ideophone	**Meaning**
gbélélé	‘sound from dinging hit of a metal gong’
gbéréré	‘sound from thumping on tight skinned drum’
gbíìrìrì	‘sound of tearing away someone’s spinal tract’
ɣìrìrì	‘sound of vigorous peeling skin or muscle away’
ɣìrìgùóó	‘sound from the thump of two objects’
pòòxóró	‘sound from intense burst of tears’

1.2 Ideophone behavior

There are a number of constraints on Emai ideophonic forms that pertain to the voice/voiceless dimension of consonants. Some ideophone pairs contrast in voice quality of C_1. The voiced member, compared to its voiceless counterpart, is associated with greater loudness of the environmental sound being coded. Such pairs are shown in (6).

(6) a. *bóí / póí* 'popping sound from pulling a tree out of the ground'
b. *váò / fáò* 'zinging sound from an arrow shot through the air'
c. *gbàán / kpàán* 'smacking sound from hand hitting on head'
c. *gbìó / kpìó* 'cracking sound from hitting someone with a cane'

There is also a tendency for some ideophones to not pair and thus show only a voiceless C_1. For such examples the voiced counterpart surfaces in some cases as an extant verb (7b) and (8b).

(7) a. *kùén* 'snapping sound from breaking a stick in two'
b. *guɛn* 'to bend'

(8) a. *kúá* 'sound of pouncing onto another'
b. *gua* 'to heap earth onto earth'

Vowels in Emai ideophones fail to show constraints regarding their open/close, front/back, or roundedness qualities. There are ideophonic forms that express each subdimension of these contrasts, either in a CV syllabic profile or a profile with multiple CV elements. The open/close contrast is shown by open [a] in *gbágbágbá* relative to close [u] in *búɣábúɣá* and close [i] in *gbì*. The front/back contrast is shown respectively by the front vowels [i] in *dì*, [e] in *gèdè*, and [ɛ] in *gbɛ̀*, compared to the back vowels [u] in *púpúpú*, [o] in *gbó*, and [ɔ] in *gɔ́*, which also employ roundedness.

More puzzling perhaps is that after C_1 position, vowels often pair (V_1V_2), as in (9)-(12).

(9) a. *póí* 'sound from a pop as one object pulled from another'
b. *fáò* 'sound from noisy zinging of a light object moving through the air'

(10) a. *gbòí* 'sound snapping from a plucking event'
b. *kúá* 'sound of coming into contact via pouncing'

(11) a. *dùé* 'sound from air rushing out of a body'
b. *dùé* 'sound from a forceful smash of two objects'

(12) a. *kpáí* 'sound from a sharp snap of a separating event'
b. *gèì* 'sound of a bang from an exploding gun'

When vowel combinations like these occur, V_2 appears to be a remnant verb suffix of perfective aspect, suggesting thereby the emergence of ideophones from verbs. In Edoid this remnant marker was phonologically variable and remains so to some extent in Edoid Bini. Agheyisi (1991), for example, cites the following generalizations. When the verb vowel is [u],

[i], [o], perfective is, respectively, [u], [i], [o]. When the verb vowel is [e, a, ɛ, ɔ], perfective is [e].

In Emai there are some ideophones that appear to reflect the operation of such a vowel harmony process: [u] after [u], [i] after [i], [o] after [o], and [e] after [a], as in (13).

(13) a. *gùú* 'sound from air whooshing out of a body when stabbed'
b. *dìì* 'sound from rumble of thunder'
c. *bòó* 'sound from a sudden, sharp thump of a hit'
d. *káé* 'sound of high-pitched ping from hitting of hard objects'

But there are also some VV combinations (14) that do not align with these generalizations.

(14) a. *dùé* 'sound from a forceful smash in a hitting event'
b. *bèú* 'sound from a sudden, sharp smack a hitting event'
c. *fáà* 'sound from a light object whistling through the air'
d. *váò* 'sound from an object zinging through the air'
e. *váà* 'whistling sound of arrow rushing through space'

Today in Emai, the perfective retains a relatively constant *-i* form, as in the ideophones of (15). There are also a few *-e* forms spread across its lexicon.

(15) a. *gèì* 'sound from banging of an exploding gun'
b. *bóí* 'sound from the pop of a pulling out event'
c. *gbòí* 'sound from a snap in a plucking event'
d. *káí* 'sound from hard objects hitting in high pitched ping'
e. *kpáí* 'sound from sharp snap in a tearing event'
f. *tèí* 'sound from the pop of a submerged object that surfaces'

A complicating factor for any claim that a VV sequence in an ideophone reflects only a verb plus perfective suffix will be discussed in the next section. There we assess the historical propensity for omission of C_2, thus resulting in the sequencing of V_1 and V_2.

Despite complications in interpreting vowel combinations, the Emai data thus far discussed support the notion that ideophones are derivative forms that historically emerged from verbs rather than some other part of speech (Childs 1989, 1994).

Moreover, the presence of a remnant of perfective inflection on at least some Emai ideophones suggests that the historical process guiding ideophone emergence was not based on uninflected predicative lexemes, as suggested by Creissels (2001). Emai provides direct evidence that some erstwhile verb forms that were inflected for viewpoint aspect became lexicalized as ideophones.

2. Residual issues

Before concluding we take a brief analytic excursion through some ideophonic forms that have proved problematic and, in some cases, remain so. We consider some phonological, morphological, and syntactic properties of ideophone structure and distribution.

2.1 Phonology

In preceding sections, we found that ideophones of sound in Emai exhibit syllabic profiles where C_1 in a CV(V) or CV(V)CV structure has a velar, alveolar, or labial character. Not all sound ideophones exhibited a syllabic profile where C_1 is either velar, alveolar, or labial. Some began with sounds that are palatal or glottal. These include the forms in (16).

(16) a. *čɔ́ɔ́n* 'sound from zipping into a hole quickly'
b. *yɔ́ɔ́* 'sound from a plop of maize on the ground'
c. *hágbìó* 'sound from the swoosh of a moving cutlass'
d. *húáɣòí* 'sound from loud snoring'
e. *hùén* 'sound of a sudden, final snap'

Ideophones of this nature appear to reflect ongoing sound changes. The ideophone *hùén*, for example, shows an extremely high formal and functional similarity to *kùén* 'sound of a sudden snap,' which is identified in Table 1. The two forms differ only in the phonological character of C_1, i.e. [k] vs. [h]. Lenition of this type has been identified for the Edoid group by Elugbe (1973, 1989), who discussed various diachronic changes of like nature in his comparative studies, which did not encompass ideophonic forms.

Another possible case of lenition of a velar sound is shown in (17a-b). Here we have two ideophonic forms with a very similar if not identical function but contrasting consonant forms in C_1 position. They also reflect morpheme reduplication and triplication, respectively. C_1 is a velar fricative [ɣ] in the reduplicated form, whereas C_1 in the triplicated form is a bilabial approximant [ʋ]. Given the similarity of function between these two ideophones, lenition from [ɣ] to [ʋ], probably through other intermediate sounds, seems to be a reasonable sound change.

(17) a. *ɣìrìɣìrì* 'sound from dirt sloshing through air'
b. *vìrìvìrìvìrì* 'sound from an object sloshing through air'

In other Emai examples, the syllabic profile of an ideophone pair reveals a more severe process of lenition. There are ideophone pairs where a C_2 element is evident in one member but not in the other. C_2 lenition of this type appears in ideophone pairs where either velar [ɣ] or [r] has been deleted, as in (18) and (19) respectively.

(18) a. *gùòɣó* 'sound from the crash of objects in contact'
b. *gùòó* 'sound from the crash of objects in contact'

(19) a. *pòró* 'sound of an intense tearing event'
b. *pòó* 'sound of an intense tearing event'

Another phonological feature of ideophones that will require attention in the future is tone. If ideophones derive from verbs, as we have hypothesized, then the tone of verbs in the lexicon becomes highly relevant. In the Emai case, as well as in most other Edoid languages (Amayo 1975, 1976; Elugbe 1973, 1989), verb elements in the lexicon are toneless. In clausal structures, verbs acquire their tone from a neighboring grammatical morpheme such as the high tone of perfective aspect or the low tone of the imperfective.

Given this toneless condition, one might consider either of two possibilities. On the one hand, an ideophone might retain the tone of its etymological verb in the clausal frame from which it initially emerged. On the other hand, given that verbs are toneless in the lexicon, perhaps forms were assigned a default tone due to their newly acquired status as ideophones.

However, a quick review of tonal patterns in Table 1, 2, and 3 suggests that ideophones do not display a default tonal pattern that is uniform, either all high, all low, or various combinations of high and low. It may be that when ideophones initially emerged they retained the perfective high or imperfective low of their verb etymon as it appeared in a clausal frame. An example ideophone like *káé* 'high pitched pinging sound from hitting a hard object' would then not be surprising. One could assume that *káé* derived from an erstwhile verb stem with the morphological shape *ka-é* [become dry-PFV], where *-é* with high tone marks perfective aspect and its high tone associates leftward to the toneless verb form *ka*. Alternatively, we could assume that all ideophones derived from verbs would exhibit either the high tone of the perfective or the low tone of the imperfective. As is evident in Tables 1, 2, and 3, ideophones do not display such a non-default, assigned tone pattern either. Tonal patterns on ideophones thus deserve more research attention, especially in the Edoid group. Beyond this, the tonal data from Emai ideophones further supports a conclusion that is contrary to the hypothesis that verbs as uninflected predicate lexemes became ideophones. The Emai data argue that inflected verbs may, in fact, have become ideophones. Clearly, more investigation needs to be directed to ideophone tone, its possible source, and its possible relation to grammatical morphemes.

2.2 Morphology

There is a further issue that arises from our hypothesis that ideophones of sound derived from the formal and functional properties of verbs. Our discussion of this hypothesis has assumed that the verb-to-sound relation is indirect. That is, the verbs in question do not encode sound directly; sound is a byproduct of the interaction among participants in events that the verbs encode. To be sure there are Emai verbs that express a sound (noise) in the non-human environment. Among these is *gbogo* 'to bang about.' Seldom have we found that such verbs of sensory experience evolve into ideophones. They rarely serve as the source of an extant Emai sound ideophone.

For an Emai verb that is the source of an ideophone, the formal and functional similarity between verb and ideophone ranges from relations that are quite transparent to those that are exceedingly opaque. To achieve some diachronic insight into these examples, a certain analytic level of morphological and semantic granularity between verb and ideophone properties must be identified.

A relatively transparent etymological relation between verb and counterpart ideophone appears evident in (20) and (21). The triplicated ideophonic forms in (20a) and (21a) can, without much reflection, be seen as derived from the corresponding verb forms.

(20) a. *gbégbégbé* 'sound from smacking a drum'
b. *gbe* 'to hit a drum'

(21) a. *púpúpú* 'sound from vigorous wing flapping'
b. *pupu* 'to stumble about'

A bit more puzzling at first glance is the example in (22). The ideophone in (22a) and the verb in (22b) seem to have quite distinct, unrelated meanings.

(22) a. *gúɔ́* ‘sound from divining seeds jingling to the ground one after the other’
b. *guɔ* ‘to shiver’

The form in (22a) pertains to sound, while the form in (22b) refers to a bodily sensation. Such meanings reflect distinct modalities. However, on reflection, the distributed sound from the jingling of divining seeds matches well with the distributed sensation of shivering. One might even think of it as a sort of synesthetic cross-over.

In contrast, more opaque relations occur with multi-morphemic ideophones that lack the vowel-initial quality of traditional lexical compounds, i.e. analytic or synthetic. In (23) and (24) the meaning of each ideophone pertains to the sound produced by contact between two objects. The occurrence of a form that reflects verb *gbe* ‘to hit’ as the initial CV syllable in each ideophone should therefore not be surprising (23b, 24b).

(23) a. *gbé-réré* ‘sound from a thumping hit on tight skinned drum’
b. *gbe* ‘to hit’
c. *rere* ‘to be far from’

(24) a. *gbé-lélé* ‘sound from a dinging hit of a metal gong’
b. *gbe* ‘to hit’
c. *lele* ‘to copulate’

However, the semantic contribution of the final CVCV sequence (23c, 24c) to ideophone meaning does not seem equivalent for each triplicated form. The example in (23a) has final sequence *rere*. An Emai verb form related to this sequence is *rere* ‘to be far from,’ as used in (25a). Consistent with the latter meaning, one might suggest that the ideophone in (23) can be understood as referencing the distance that a particular sound has travelled or the length of time it persisted.

(25) a. *áfúzé'* *réré* *vbì* *òkè*
Afuze:PRX PST:be.far LOC Oke
‘Afuze is far from Oke.’

b. *ɔ́lí* *ɔ́mɔ̀hè* *ɔ̀* *ɔ́* *lèlè* *ɔ́lì* *òkpòsò*.
ART man:PRX SI PRS copulate:IPFV ART woman
‘The man is copulating with the woman.’

But the contribution of *lele* ‘to copulate’ to the meaning of example (24a) seems less evident. If we assume that this second morpheme also has something to do with distance, spatial or temporal, then the relative duration of any action denoted by *lele*, brief or not, might be referenced and so contribute a relation of proximity or briefness to the sound associated with hitting a gong. If we do not make an assumption along these lines, the meaning of (24a) remains, at least for us, opaque.

Another seemingly opaque relation between ideophone pairs is exhibited in two other sets of examples, those in (26) and (27). Within each set there are similar meanings but only

one similar formal element. The common morpheme element in (26a-b) is *kpíɔ̀n*, while in (27a-b) it is *gbàán*. The form that is not common in each set is the root form *gVndVn* with its contrasting vowel variants.

(26) a. *kpíɔ̀n-gɔ̀ndɔ̀n* 'sound from extremely loud gulping'
b. *kpíɔ̀n* 'sound resulting from gulping to a great depth'

(27) a. *gbàán-gándán* 'sound from extreme scolding'
b. *gbàán* 'sound from scolding or shouting'

Interesting about the forms in (26a) and (27a) is a harmonic relation between the final vowel of the initial morpheme and the two vowels of the final morpheme. Since the tone of the final vowel of the initial morpheme is also harmonic, we will assume that the relation involved in the (26a) and (27a) forms reflects a copy process rather than one of vowel harmony. As to the meaning of *gVndVn*, we hypothesize that it adds a semantic element of extremeness to the meaning of the forms *kpíɔ̀n* and *gbàán*. We motivate this hypothesis based on the Emai adverb *gbɔ́ndɔ́n* 'extreme condition of viscosity' that appears in the (28a) clause, which contrasts in meaning with the (28b) clause that has no adverb.

(28) a.

ɔ́lì	*òmì*	*ɔ̀*	*ɔ́*	*sùn*	*gbɔ́ndɔ́n*.
ART	soup:PRX	SID	PRS	be.viscous:IPFV	extremely

'The soup is extremely viscous.'

b.

ɔ́lì	*òmì*	*ɔ̀*	*ɔ́*	*sún*
ART	soup:PRX	SID	PRS	be.viscous:IPFV

'The soup is viscous.'

Although not an exact phonological match to the forms in (26a) and (27a), where [g] rather than [gb] occurs, form *gbɔ́ndɔ́n* has near identical sound properties. Syntactically, however, the *gbɔ́ndɔ́n* form in (28a) is an adverb, not a verb, as one might expect based on some of our earlier discussion, as with (20) and (21). Holding to the adverbial status of the *-gɔ̀ndɔ̀n/-gándán* elements, it seems that Emai ideophonic forms might be viewed not only as derivatives of verb forms or verb plus verb forms but also as combinations of verb plus adverb forms. As a final complicating factor regarding the morphemic unit *gbɔ́ndɔ́n*, there is in Emai an ideophonic form *gbɔ́ɔ́* that has the meaning 'extreme condition of length' as it applies to the clothing item, trousers. Given the translation 'extreme condition' and its highlighting of a semantic element of intensification, it seems reasonable to view *gbɔ́ɔ́* as a reduced variant of *gbɔ́ndɔ́n*. It would thus seem that adverbial forms and meanings might also prove crucial to understanding Emai ideophones. Even more opaque meaning units arise from the examples in (29) and (30).

(29) a. *pòó-xóró* 'sound of intense bursting into tears'
b. *pòó* 'sound of an intense bursting into tears'
c. *xóró* ? meaning

(30) a. *rìì-gùòó* ‘sound from crashing objects colliding’
b. *gùòó* ‘sound from crashing objects colliding’
c. *rìì* ? meaning

As (29a) indicates, the ideophone *pòóxóró* refers to the sound of tears bursting. The same can be said for *pòó*, the form identified in (29b). This being the case, what then is the contribution of the morpheme *xóró* to the meaning of the ideophone in (29a)? We have scoured our database and have not been able to identify any form of the shape *xóró* or any relevant function related to some phonological variant of *xóró*.

A similar situation obtains in (30) for the relationship between the ideophones *rììgùòó* and *gùòó*. In narratives both refer to a crashing sound. Since *gùòó* alone has this meaning, we again ask what is the contribution of morpheme *rìì* to the meaning of (30a)? No clues are provided by existing ideophones or non-ideophones in our Emai lexicon. But as shown in (31), there is a form *ri* that expresses a be-locative meaning and an adverbial form *ríríírí* that intensifies to an extreme the meaning of the warm color verb *vbae* ‘red.’

(31) a. *ɔ́lì* *òkpòsò* *rîì* *vbí* *íwé* *ísì* *òjè*.
ART woman BE LOC house ASS Oje
‘The woman is in the house of Oje.’

b. *ɔ́lí* *úkpún* *ɔ́* *ɔ̀* *vbàè* *ríríírí*
ART cloth:DST SI PRS become.red intensely
‘The cloth is intensely red.’

It is not obvious how either of these meanings relates to that of the form *rììgùòó*. Perhaps the semantic dimension “extreme” of the *ríríírí* adverb has been isolated by Emai speakers and assigned to the meaning of the sound ideophone *gùòó*. However, the formal shape of *ríríírí* is considerably reduced and its tone has likewise been shifted from high to low. Given the lack of success of such analyses, we deem the ideophone *rììgùòó* to be another morphological puzzle.

2.3 *Syntax*

Given the morphological complexity of some Emai ideophones and our analytic failure to bring insight to their structural properties, one might re-visit the one-time hypothesis that ideophones are generated spontaneously in their narrative usage and that they are heavily dependent in their narrative settings on linguistic and extra-linguistic context for their form and meaning. If this were to hold, one might well consider that ideophones would not engage with other clausal elements in a syntactic construction. Such a conclusion does not seem warranted, however. There is evidence in Emai that ideophones do interact syntactically with other elements in a clause.

As a starting point, we assume that the great majority of Emai sound ideophones arise through a cause-effect configuration between participants in a contact situation (Schaefer & Egbokhare, to appear). We also assume that the effect portion of this configuration reflects a figure-ground relation among its participants, where a figure element’s contact with a ground element produces a sound.

In examples 32-36, we identify ideophones of sound and corresponding clausal structures, one of which is a simple clause of sound perception marked by the verb *hɔn* 'to hear' immediately followed by an ideophone. The other two clauses present a ground element in a *vbì* (locative) marked phrase with either an overt or implicit figure element.

(32) a. *gbìó* 'cracking sound from hitting a ceramic pot.'
b. *ú hɔ́n-í gbìó* 'You heard a cracking sound.'
c. *ú hɔ́n-í vbí áxé gbìó* 'You heard on a pot a cracking sound.'
d. *ú hɔ́n-í gbìó vbí áxè* 'You heard a cracking sound on a pot.'

(33) a. *tàán* 'sound from dinging of cracked palm kernels.'
b. *ú hɔ́n-í tàán* 'You heard a dinging sound from cracked palm kernels.'
c. *ú hɔ́n-í vbí ótɔ́í tàán* 'You heard from the ground a dinging of cracked palm kernels.'
d. *ú hɔ́n-í tàán vbí ìtɔ̀ì* 'You heard a dinging of cracked palm kernels on the ground.'

(34) a. *yɔ́ɔ́* 'sound of heavy plopping of maize on the ground.'
b. *ú hɔ́n-í yɔ́ɔ́* 'You heard a heavy plopping sound.'
c. *ɔ́lí ɔ́ká ɣé ú vbí ótɔ́í yɔ́ɔ́* 'The maize just did on the ground a plop.'
d. *ɔ́lí ɔ́ká ɣé ú yɔ́ɔ́ vbì ɔ̀tɔ̀ì* 'The maize just made a plop on the ground.'

(35) a. *rììgùòó* 'crashing sound of objects hitting each other.'
b. *ú hɔ́n-í rììgùòó* 'You heard a crashing sound of objects.'
c. *úxùèbɔ́ ú vbí égéén ɔ́xà rììgùòó* 'A charm did under the cotton tree a crash.'
d. *úxùèbɔ́ ú rììgùòó vbí égéén ɔ́xà* 'A charm made a crash under the cotton tree.'

In (32c-d) and (33c-d) the sound and ideophone elements follow the verb *hɔn* 'to hear,' while in (34c-d) and (35c-d) they follow the verb *u* 'make/do'. Regardless of verb, *hɔn* or *u*, the respective ideophonic forms either follow the locative *vbì* phrase or precede it. They thus interact with other syntactic phrasal elements. For present purposes, we assume that the positional variation between locative phrase and ideophone is governed by focus considerations, which is beyond the scope of the present discussion. To reiterate, syntactic constructions such as these demonstrate that ideophonic forms in Emai interact with non-ideophonic phrasal elements in syntactic constructions. In their contemporary narrative usage, ideophones are not spontaneously produced, although spontaneity may have characterized their earliest usage. We, therefore, conclude that Emai ideophones of sound have become integrated into their grammatical system.

Conclusion

In the Africanist tradition, it has long been recognized that there is something special about ideophones that makes them different from more prosaic words. Whatever this might be, it is not that ideophones lack intriguing and complicated phonological, morphological, and syntactic properties. In fact, our analysis of ideophones suggests that this special quality should be sought through ideophone interaction with the broader grammatical systems in which they

operate. Indeed, our naturalistic data appear to support recent views that sound symbolic correlations pertaining to ideophones are better sought relative to broad structural correspondences rather than a single acoustic feature (Haynie, Bowern & LaPalombara 2014; Dingemanse et al. 2016; Johansson et al. 2020).

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Abbreviations

Abbreviations for grammatical morphemes follow as much as possible the Leipzig Glossing Conventions. Nonetheless, we highlight the following terms: DST=distal temporal reference, PRX=proximal temporal reference.

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Dynamic extensions of iconic form-meaning mappings in visual media, viewed through a prismatic lens

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It is generally assumed that iconic words, e.g., ideophones or onomatopoeias, consist of stable form-meaning mappings, in which aspects of an iconic word's form reveal something about aspects of its meaning. Such stability comes to the fore through attempts of phonosemantically inventorying segmental mapping for particular languages' iconic lexicons, or by treating iconic words as windows for peering into language evolution. Yet, there are many examples of iconic words undergoing semantic shifts in diachrony as well as in synchrony. The current study shows how semantic shifts of iconic words can be triggered in visual-only media (advertisements, social media) and accounted for through the prismatic model (Geeraerts 2002), an alternative for the integrative multimodal metaphor approach that focuses on semantic shifts of the composite expression as a whole and the shifts that its constituent parts undergo. The conclusion is that if synchronic usage in a visual-only medium already enables dynamic extensions of iconic form-meaning mappings, the presumed stability of such mappings in diachrony, let alone deep language evolution, is put into question.

Keywords: *iconicity, ideophone, multimodal metaphor, language evolution, prismatic model*

Introduction

Since the end of the 20th century, linguists have increasingly devoted attention to the phenomenon of iconicity and how it permeates all levels of linguistics, e.g., the order of Caesar's *Veni, vidi, vici* "I came, I saw, I conquered", which mimics temporal event order, or words like *bzzz* 'buzzing of insects.' By iconicity we understand "a signal from any modality or medium in which production and/or interpretation *involves a sense of resemblance between at least some aspect of its form and at least some aspect of its meaning*" (Winter, Woodin & Perlman 2025, emphasis mine). Often this comes down to a graded phenomenon (Dingemanse, Perlman & Perniss 2020) that is not necessarily shared by all people involved in the communication process; the very presence of iconicity indeed is to be found "in the eye of the beholder" (Occhino et al. 2017).

Iconicity is, however, traditionally seen as a special property or exception to the majority of linguistic structures and elements. This axiom of the arbitrariness of the sign dates back to at least de Saussure (1916). But even then, de Saussure already recognized a category of lexical items that fell outside of this axiom, namely ONOMATOPOEIAS, or sound-depictions. Fast forward a century and we now know that the variety of onomatopoeias across languages is much more varied and extensive than presumed (Körtvélyessy & Štekauer 2024). Additionally, Western encounters with typologically different languages have widened the potential range of what can be depicted through similar means as onomatopoeias. Not only sounds, but also other sensory domains like textures, movement, smells, cognitive states, pain and so on. One overarching term for this kind of iconic words is IDEOPHONE (Doke 1935), cross-linguistically defined as a "marked word that depicts sensory imagery and belongs to an open lexical class" (Dingemanse 2019).

Such words often display multiple manifestations of iconicity. For example, *ding dong* /dɪŋˈdɒŋ/ 'bell tolling' has a vowel ablaut /ɪ-ɒ/ but also ends with a sonorous nasal /ŋ/ that gives the word an effect of perduring resonance. Therefore, there is much to say about languages having a substantially larger prosaic lexicon and a "special" iconic lexicon, in which words display iconic phenomena like *ding dong*. After all, one benefit of iconicity is that it affords more transparent structural mapping between form and meaning (Emmorey 2014; Thompson & Do 2019; Punselie, McLean & Dingemanse 2024). A second is that such words are easier to learn (Imai & Kita 2014; but see also Nielsen & Dingemanse 2021). A third benefit is that they tap into universal sensitivities, as shown by the well-known *kiki-bouba* effect (Ramachandran & Hubbard 2001), the association of /r/ with roughness and jaggedness (Winter et al. 2022; Ćwiek et al. 2024), or sounds involving [+airflow], such as fricatives with the notion of 'wind' (Thompson, Van Hoey & Do 2021).

It is no wonder then that scholars have tried to systematically map the iconic segmental form-meaning mappings for items within the iconic lexicons they were studying. Perhaps the most well-known example is Hamano's extensive phonosemantic mapping of Japanese ideophones (Hamano 1986; 1998). Japanese ideophones prototypically consist of a CVCV-CVCV structure, like *pika-pika* 'flashing' or *koro-koro* 'small thing rolling'. According to Hamano, the position and quality of consonants and vowels in the disyllabic roots of these items can indicate different things. So, in CVCV, the first consonant indicates haptics, the first vowel size, the second consonant movement, and the last vowel area. The secret to unlocking the meaning of Japanese ideophones then lies in a combinatory computation of these segments.

Curiously, similar observations have also been made in anthropological linguistics to describe the onomatopoeic system of Berber musical instruments[34]: the first consonant indicates the way in which the hand hits the drum: hard (*tt*, *t*), less hard (*p*), softly (*dd*, *d*). The second consonant indicates the resonance: long (*m*, *n*, *mm*, *nn*), less long (*g*), no resonance (*q*). Vowels do not appear to contribute transparently to the form-meaning mapping of words like *ddinn*, *tann*, *dann*, *pamm*, or *taq*, all used to describe sounds of striking the tambourine (Lortat-Jacob 1980: 131-132).

With all the emphasis on the transparency of structural form-meaning mappings it is perhaps no wonder that the power of iconicity exudes the appeal of viewing these words in the context of distant linguistic evolution (Haiman 2018), going so far as to consider them linguistic fossils, lying unchanged and scattered waiting to be found as odd curiosities that function as "windows [for peering into] previous stages in the evolution of languages" (Di Paola, Progovac & Benítez-Burraco 2024: 9). An important factor in this reasoning is gesture: when ideophones depict scenes or events in a spoken manner, an accompanying depictive gesture is not unexpected. Such ideophone-gesture compounds have been observed time and again (Kita 1997; Dingemanse 2013; Nuckolls 2020, etc.) However, the leap from ideophones' natural locus of occurrence within dyadic storytelling, narratives, ritualized language, poetry and so on to a rebranding as linguistic fossils is too big and overlooks their semantic-pragmatic usage or word effects.

As iconic *words*, ideophones are subject to phonotactics (often "stretching the system", see Nuckolls et al. 2016) but also sound or meaning change. Once the form or the meaning in the iconic mapping is extended beyond a threshold, the iconic word finds itself on a treadmill toward arbitrariness from which there is no going back, as Flaksman's (2017, 2024) metaphor aptly conveys. Additionally, not all ideophones easily co-occur with gestures. Sound depictions,

[34] I wish to thank Ḥamid Ouyachi for drawing my attention to this source through Bluesky.

which rely on imagic iconicity, often do not need the gestural support (Hatton 2016). Furthermore, it has been observed that while there are core meanings to ideophones, they are also often extendible, even for onomatopoeia, which are assumed in this evolutionary line of thinking as being the most fixed. For example, Akita (2013) compares 30 different sound depictions across four languages (Japanese, Mandarin Chinese, Korean, English) and identifies metaphorical extensions that vary between languages, referential specificity, event-semantic complexity and syntactic status.

Semantic extensions often coincide by introducing new collocates or referents, to which the core meaning and the schemas is further adapted to (Lu 2006; Van Hoey 2020). To give an example, *fuwa-fuwa* is reasonably well-known in the literature to mean 'fluffy (e.g. towel)' or 'puffy (e.g. cake)', i.e., a stationary depiction of texture or vision. However, this ideophone can also be extended to mean 'unsteady floating (of a balloon)' and from there also indicates a sense of 'restlessness', respectively motion and a cognitive state (Lu 2011; Van Hoey 2023). In another example, the Pastaza Kichwa ideophone *polang* 'gliding *through* the water' is easily converted into 'splashing *up towards* the surface of the water' by native speakers through the incorporation of gestures to facilitate a dynamic reinterpretation of the typical meaning of 'gliding through the water'.

So, while iconicity is a real linguistic phenomenon, found and reaffirmed in many experiments or rating studies (Dingemanse et al. 2016; Van Hoey et al. 2023; McLean, Dunn & Dingemanse 2023; Winter et al. 2023, among others), this does not mean that these iconic words are set in stone, or indeed, have been fossilized. Precisely because such thinking overlooks the dynamic interplay that is at the core of depiction and the power of mental construal (in the sense of Cognitive Linguistics as used by Langacker 2008) that makes meaning, and by extension form-meaning, more malleable.

In this paper, I explore the dynamic nature of iconic form-meaning mappings in visual-only media. First, the use of ideophones in different media (presence/absence of sound/vision) is surveyed (Section 1). This is followed by an investigation of iconic words used in the deliberate visual medium of advertisements through an integrative multimodal metaphor approach (Section 2). Then a different framework – the prismatic model – is introduced and applied to advertisements (Section 3). Next, it is shown that less deliberate media like social media also have dynamic iconic form-meaning mappings (Section 4). Finally, I conclude that iconic form-meaning mappings are often more malleable than is often assumed.

1. The usage of ideophones in visual media

The canonical usage context in which ideophones spontaneously spawn involves dyadic conversations, as much observational work has shown (see for example Nuckolls 1996; Dingemanse & Akita 2017). In such settings, speakers take advantage of the multimodal setting to emphasize the required iconic form-meaning mappings by using marked forms in terms of phonation, prosody, morphology, syntactic placement, construction and so on (Dingemanse & Akita 2017). These conversational settings also afford emergent extensions of ideophones' typical meanings, as the examples of *fuwa-fuwa* or *polang* above demonstrate. In other words, dynamic meaning extensions often rely on multimodal cues belonging, predominantly, to the domains of sound and/or vision.

But what happens when the communicative process is broken up by the dimension of time? That is, when a sender encodes a meaning through iconic means for an addressee that the

sender does not know the identity of. This may still involve the multimodal nature of the canonical usage context, or in the absence of a domain, find a way to recover this. In Table 1, I list a few examples of situations in which iconic words have been identified in the presence or absence of either sound or vision.

We can make quick riddance of communicative setting (IV) in Table 1: there needs to be a signal, and unless it is conveyed in a domain different from sound or vision (e.g., smell as in chemoception known from the insect world) there is no typical communicative setting to illustrate the absence of sound and vision.

Then, we turn to communicative setting (II) in Table 1, which involves sound recordings of (filmed) conversations or radio (commercials) and the like. For instance, Vidali-Spitulnik (2012: 256) discusses the nickname of a Zambian radio host based on an onomatopoeia, "Mfu-mfu-mfu", which is explained as 'the flow of words without stopping', itself already a metaphorical extension of the iconic typical meaning of this onomatopoeia 'sound of water sloshing around in a tin bucket, *mfu mfu*.' Onomatopoeia can also be used as euphemisms, like the metonymic shift of *twatwa* 'sound of sexual sounds during intercourse > sex' as observed in a Kenyan English radio interview (Amwona & Ogutu 2024). In setting (II), there is an absence of visual elements, but the iconic mappings are entrenched enough for hearers to access the typical meaning and, given the context, apply the correct shift in meaning. Note that the semantic shifts exemplified here are not particularly culture-specific and subsequently do not require a high degree of familiarity with these cultures. As an aside, it is easy to find parallels in, for instance, Chinese ideophonic usage: the expression *tāotāo bù jué* 滔滔不絕 literally depicts 'surging.IDEO without end' but is used to describe someone who keeps on talking endlessly; and *pāpāpā* 啪啪啪 involves the same metonymy to mean 'sex.'

Table 1: Examples of communicative situations in the modalities of sound and vision

		visual domain	
		present	***absent***
sound domain	***present***	(I) - dyadic conversations - TV (commercials)	(II) - recordings of conversations - Radio (commercials)
	absent	(III) - Comics, manga - still advertisements - social media	(IV) NA

Looking at communicative setting (I) in Table 1, we have the canonical usage context of ideophones, namely dyadic conversations. Based on excerpts from the multimodal NHK East Japan Great Earthquake Archives corpus, Dingemanse & Akita (2017) show how speakers naturally make use of all sorts of semiotic tools available to convey meaning, often resorting to conventionalized yet iconic ideophone-gesture compounds, e.g., one speaker utters *baan* 'baang (big impact)' at the same time as gesturing iconically with both open palms moving toward her face (Dingemanse & Akita 2017: 17).

Gesture may also be used to disambiguate different senses. Nuckolls exemplifies this through the item *polang* and how a full-body upward motioning of both arms indicates its meaning as 'briskly rising up to the surface' (with reference to manatee poop). She notes that

the speaker briefly *becomes* the referent in a speaker-internal perspective, and contrast this with a speaker-external perspective, where the body is more detached, only moving one hand horizontally across the water. This illustrates the second meaning of *polang* 'moving across the water' (Nuckolls 2020). In short, in the canonical context, ideophones marshal multiple means to dynamically select the correct meaning. While these examples do not necessarily involve a shift in meaning, like in the literal depiction of *baan* or the selection of the correct meaning in a polysemous network of *polang*, they are great at displaying the flexibility of the iconic form-meaning mapping.

Finally, communicative setting (III) in Table 1 targets an almost canonical usage of ideophones that has attracted much interest in the last few decades. It is well-known that onomatopoeias are used in (Western) comic books (Pratha, Avunjian & Cohn 2016). Broadening up the range of sensory items depicted, all sorts of ideophones are found in Japanese manga (Pratha, Avunjian & Cohn 2016). The main function of iconic words here is to recover the absence of sound (no spoken modality) and depict the typical meaning of items. In comics or manga, it is rather rare to find meaning extensions, precisely because of that recovery function. Visually, this is marked by the superposition of iconic words in special (perhaps more iconic) fonts outside of the speech balloons or narrative boxes (Cohn & Schilperoord 2024: 219).

While the aim of ideophones in comics and manga purports to emulate a naturalistic context, it is in fact a deliberate medium: the artist(ic team) consciously chooses iconic items that fit the context well and hence remain conservative in terms of meaning extensions. This does not need to be the case. In the next section, I will contrast this usage with that of ideophones in another deliberate visual-only medium, namely still advertisements.

2. Advertisements and multimodal metaphor

Multiple studies have pointed out that using iconic words in their typical meaning can enliven advertisements. This is not surprising, given the vividness that such words evoke. Yet at the same time, advertisers often stretch the iconic form-meaning mapping and relate these words somehow to the brands being sold. In the world of advertisements, creativity is rewarded, all in the hopes of ensnaring the consumer by making the ad more relevant (Sasamoto 2019). For example, Winter et al. (2019) study ads promoting the Korean liquor soju. These ads heavily feature sounds made right after taking a sip and swallowing: *khu* 크 [kʰɯ] and *khya* 캬 [khja]. The former supposedly sounds "harder" than the latter. Through a series of experiments involving Korean participants as well as native speakers of German, Spanish, and Mandarin Chinese these iconic associations (*khu* is harder; *khya* is softer) are found to be confirmed. In the domain of food, Toratani (2022) collects ten contributions that

Figure 1: *Schhhweppes* for Short Film Festival (Pérez-Sobrino 2013: 431)[35]

[35] Retrieved from https://www.wereallhere.co.nz/schhh.html (6 /12/2024)

each detail the interplay between iconic words and food, and its application to advertisements or food blogs.

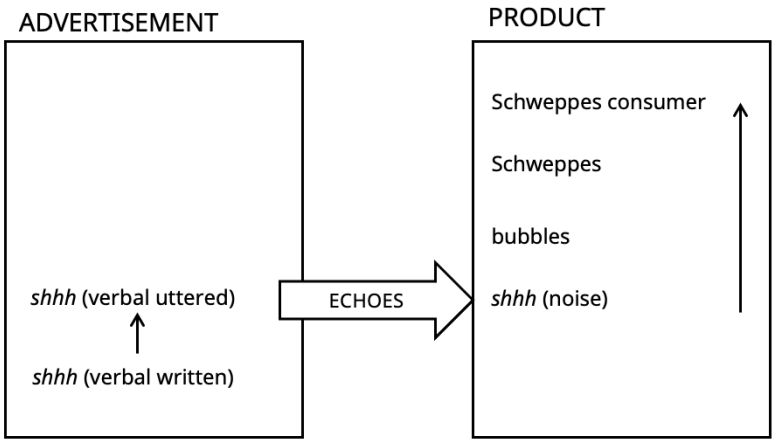

Figure 2: Diagram representation of how the multimodal metonymy works with the *Schhhweppes* Short Film Festival ad (Pérez-Sobrino 2013: 431)

But how does the use of iconic words in ads help to boost sales? According to Pérez-Sobrino (2017) the framework of multimodal metaphor (Forceville & Urios-Aparisi 2009) can aptly integrate the many different moving parts that make up ads and work together in such a way that the message is understood by the interpreter. Pérez-Sobrino's (2013: 431; repeated in 2017: 192) example of "*Schhhhhweppes*" (Figure 1) considers an ad hoc variant of the brand name *Schweppes*, which is a fizzy drink, blended together with the onomatopoeia *schhhhh* [ʃː]. This onomatopoeia, which is superimposed on an index finger in front of lips and the text "Schh… for a mature audience" is placed as a billboard over the entrance of a typical cinema entrance, promoting the short film festival sponsored by the brand *Schweppes*.

Pérez-Sobrino (2017: 116–117) presents a second *schhh*-related example, shown in Figure 3. In this example, we see the brand name Bosch presented as "BOSCHHHH" on a largely empty background, with marginally in the righthand corner a picture of a vacuum cleaner and the small text "The quietest vacuum cleaner: Bosch Relaxx Pro Silence. Only 66 dB". Again, many moving parts work together here: the verbal input of the brand name, the visual input of the corporate red typeface on a white background, emptiness that stands for silence, the blend consisting of the brand name and the onomatopoeia *schhh*. Pérez-Sobrino analyses the whole as a blend of two metonymies. The first is CAUSE FOR EFFECT – if you use Bosch appliances, they will silently do their job. The second is BOSCH FOR BOSCH vacuum cleaner (or brand for appliance of that brand). The diagram of this blend is illustrated in Figure 3.

We can see (Figure 3 and Figure 4) that the advertisement brilliantly taps into the typical iconic form-meaning mapping of relating [ʃː] to 'silence', but at the same time is dynamically extended to guide the interpreter not towards merely the depiction of silence but the notion that this vacuum cleaner is good.

What at first glance might be interpreted as a metaphor, BOSCH PRODUCTS ARE SILENT AND GOOD, turns out to rest on a number of metonymies involving the moving parts that make up these advertisements.

Figure 3: Boschhhh. The quietest vacuum cleaner: Bosch Relaxx Pro Silence[36]

While I agree with the analyses presented by Pérez-Sobrino (2017), the integrated multimodal metaphor framework succeeds in identifying the main mapping and the constituents involved but does not focus on the semantic shifts that those constituents undergo as the extended meaning is construed. Below, I present an alternative representational format, namely the prismatic model developed in Geeraerts (2002).

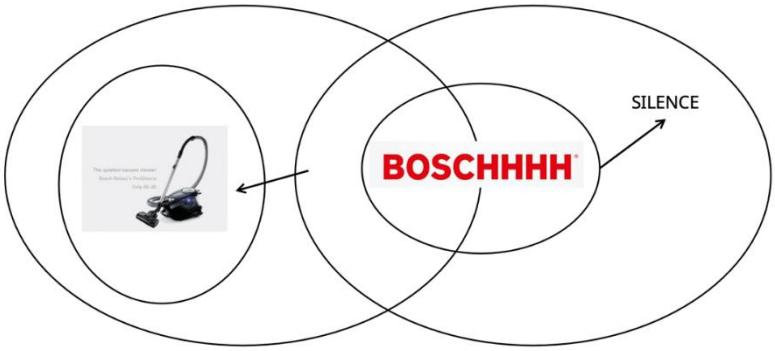

Figure 4: Onomatopoeia plus multimodal metonymy *boschhhh* for silent vacuum cleaners (reproduced from Pérez Sobrino 2017: 117)

3. A revised alternative: The multimodal prismatic model

The classification of semantic extensions has been at the core of Cognitive Linguistics since its inception around the 1980s, giving rise to many proposals over the years, e.g., conceptual metaphor theory (Lakoff & Johnson 1980), conceptual blending theory (Fauconnier & Turner 2002), multimodal metaphor (Forceville & Urios-Aparisi 2009), and metonymy (Littlemore 2015); see Li (2023) for a recent state of the art. In a hermetically sealed vacuum, metaphor involves shifts in meaning that are the result from cross-domain mapping, while metonymy involves such shifts within the same domain. In practice, however, metaphor and metonymy often overlap, as do other typical semantic extension mechanisms like generalization and specialization. Goossens (1990), for example, already noticed subsequent instances of mixed mechanisms, calling them instances of "metaphtonymy". From the examples above, it is

[36] Retrieved from https://www.adsoftheworld.com/campaigns/boschhhh (6/12/2024)

evident that multiple kinds of mechanisms can play a role in multimodal metaphor approaches too.

The integrative multimodal metaphor approach exemplified in the preceding sections focuses on naming the different constituents that make up the combined textual-visual representation and how they contribute to the overall meaning shift of the whole. However, "we should not only describe the way in which the constituent elements work together to produce a composite meaning, but we should also take into account the semantic shifts that each of the elements (and their combination) may undergo in its own right" (Geeraerts 2006: 198). The proposal Geeraerts (2002, 2006) lays out involves a PRISMATIC MODEL that shows the composite expression on top and its subsequent meaning shifts, as well as the components it is built from at the bottom, as well as their respective semantic shifts. It is perhaps best to illustrate this with an example.

Figure 5 shows how the literal meaning of the Dutch word *schapen-kop* '(lit.) sheep-head > (fig.) dumb person' is construed. On the syntagmatic composite level on top, a 'sheep's head' is extended metaphorically to read 'a stupid head', followed by a typical PART FOR WHOLE metonymy, namely 'a stupid person'. Crucially, the middle step is formally still built from 'sheep' and 'head' but only the 'sheep' part has undergone a semantic shift, namely one of metaphor (from 'sheep' to 'sheep-like'). This is later followed by another metaphorical extension ('sheep-like' to 'stupid'). Meanwhile, 'head' stays the same at the intermediate step, and then is metonymically extended to mean person, and as such the driver for the PART FOR WHOLE metonymy of the composite level.

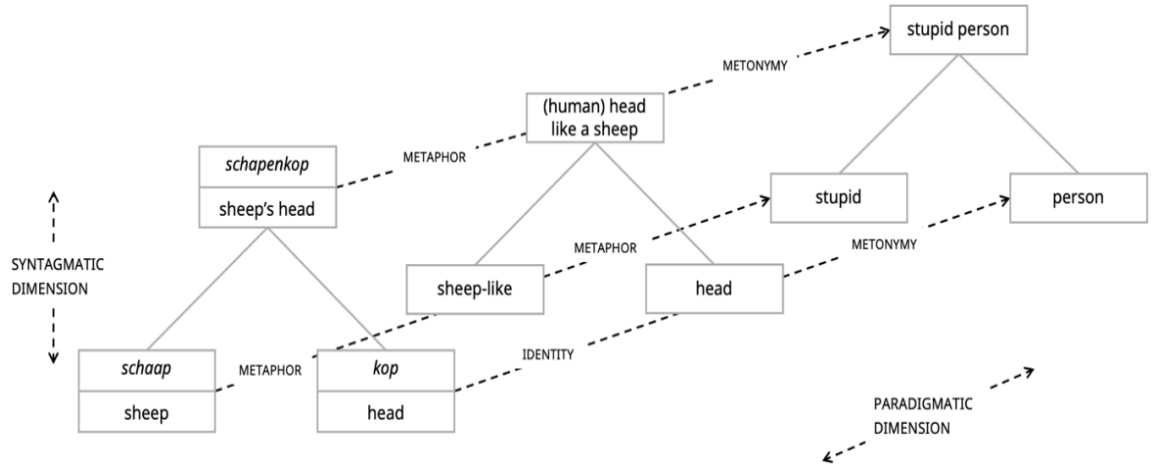

Figure 5: Illustration of the prismatic model through the example of *schapenkop* 'sheep's head > stupid person'. Vertically, the syntagmatic dimension is shown (the composite perspective). Horizontally, the paradigmatic dimension displays the conversion of the constituents as the semantic shift occurs.

The prismatic model has received its most comprehensive study with the concept of 'woman' from a diachronic perspective (Zhang 2013, 2016). With its focus on both the syntagmatic level of the composite expression and the paradigmatic semantic shifts of the constituents (the moving parts), it is a framework that lends itself well to the issues of multimodal metaphor. However, the application of the prismatic model requires at least two modifications. First, because the structure of the composite expressions (textual-visual images) is considerably more complex than compounds or idioms, the "prism" has a more complex overall structure as well. Second, since we are dealing here with iconic words, we need to add

DEPICTION as a viable relation in the semantic structure. Let us apply this to the *Boschhhh* example (Figure 3).

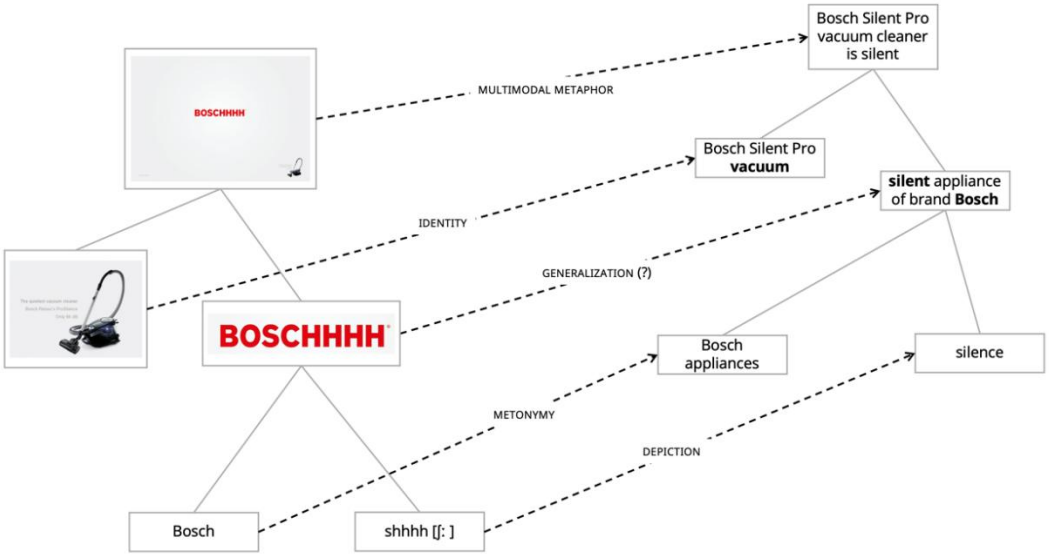

Figure 6: The prismatic model applied to the example of *Boschhh*

We had already established that the main mapping of the *Boschhhh* vacuum cleaner ad equated the brand name Bosch with silent appliances that perform adequately, something of the form BOSCH PRODUCTS ARE SILENT AND GOOD. If we analyse this example (Figure 3) with the prismatic model, we have two main components, the vacuum cleaner in the bottom right, and BOSCHHHH in the middle. The former technically consists of descriptive text as well as the pictorial representation, but can be seen as one whole here, as they fulfil the same referential function. In fact, the vacuum cleaner with descriptive text does not undergo any semantic shift in the final metaphorical interpretation; the link is one of identity. As we have already touched upon, BOSCHHHH consists of two moving parts: the brand Bosch and the iconic word *shhhh* [ʃ:]. Bosch metonymically stands for the appliances belonging to that brand. *Shhhh* has a depictive relation (alternatively, an iconic relation), which means 'silence'. Together, on this composite level, BOSCHHHH is taken to mean 'appliances of Bosch are silent'. When factoring in the vacuum cleaner, the main mapping conveys that the Bosch Silent Pro vacuum cleaner is silent. What at first sight appears to be a metaphorical mapping in fact consists of a metonymy on a paradigmatic axis of the constituents and the blend on the syntagmatic axis. Crucially, it does not involve any metaphor in the constituents yet appears as metaphor on the composite level. But what of the iconicity of the form-meaning mapping in *shhhh*? In this example, the typical mapping of 'silence' is depicted but slightly twisted by applying it to a per-definition noisy referent, namely a vacuum cleaner.

It is thus clear that the prismatic model can be applied to include iconic words in visual media. Let us look at another example. Figure 7 shows the promotional poster of a show concert organized by *Eva Air* for its VIP members. To make sense of this poster, we focus on the main text and visual imagery, which consists of two famous singers (辛曉琪 Winnie Hsin and 韋禮安 William Wei, also known as Weibird), the conductor 莊文貞 Wenchen Chuang, and the orchestra. The information about the date and location is not particularly relevant to the analysis here.

In Figure 7, the ideophone *yìyì* 熠熠 'brilliant' is placed next to its collocate and reference *xīngguāng* 星光 'startlight'. *Yìyì* belongs to the stratum of literary Chinese ideophones – you will be hard-pressed to find native speakers go about depicting starlight with this expression, yet it clearly fulfills the features of being a 'marked word that depicts sensory imagery and belongs to an open lexical class' (Dingemanse 2019). Instead, you can encounter such items in poetry, songs, or written texts. Furthermore, *yìyì* clearly depicts visual imagery (brightness, light) of a multiplex item (the stars) (Van Hoey 2020), but is placed here next to concert (*yīnyuè-huì* 音樂會), a typically audio-visual event. The audio aspect of the event is cast back onto the depiction of *xīngguāng yìyì* 'brilliant starlight', a blend that works because the (actual) stars are equated with music stars (the singers, conductor, orchestra).

Figure 7. Promotional poster for EVA Air's yearly concert for VIPs in 2017 (*Chángróng Hángkōng guìbīn zhī yè* 長榮航空貴賓之夜). The title of the concert is the 'concert of brilliant starlight' (*xīngguang yìyì yīnyuèhuì* 星光熠熠音樂會)

Let us turn to this example's proposed prismatic model (Figure 8). The main mapping we are concerned with here consists of the semantic shift observed in the textual part 'starlight brilliant concert', and its transformation into 'amazing concert with these particular singers and musicians', the latter are shown pictorially. On the composite level 'starlight brilliant concert' falls apart into three constituents, with 'starlight brilliant' forming an entrenched chunk. This is marked by the depiction relationship which is drawn perpendicular to the general direction of the evolution in the prismatic model, and which holds until the end. The 'concert' constituent remains unchanged throughout the model, linked by the mechanism of identity at each step.

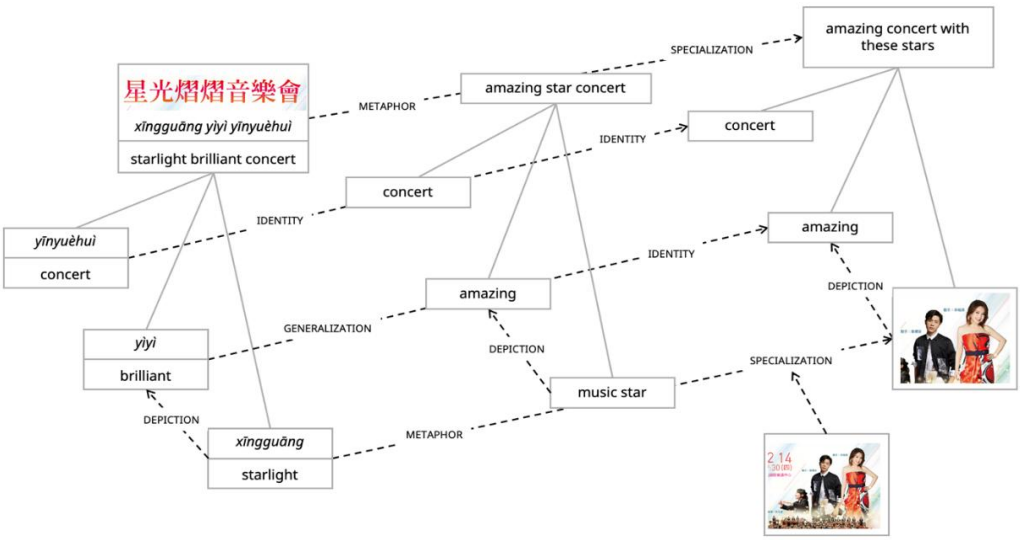

Figure 8: Prismatic model of the ‘concert of brilliant starlight’

‘Brilliant’ first undergoes a generalization – not only is this brightness, shining, or brilliance in the domain of vision or light, but also in the domain of singing and performing. In the next step, this semantic shift is kept and marked by an identity link. ‘starlight’, on the other hand, is first metaphorically mapped onto music stars, or arguably first through metaphor (A STAR IN THE DOMAIN OF MUSIC IS A STAR IN THE DOMAIN OF LIGHT) and then through metonymy (QUALITY FOR PERSON), and then specialized by the encounter with the visual input of the two singers and orchestra, resulting in a clear constituent of which singers are so amazing in this concert. This semantic machinery does not rely on arcane transformations but harmoniously converges through conceptual integration (Fauconnier & Turner 2002). But in doing so, the original iconic depiction of *yìyì* as ‘brilliant (starlight)’ has changed considerably both in meaning ‘amazingly audiovisual’ and collocate (from starlight to music star).

One can wonder whether this extension from the iconic depiction of brilliant starlight to that of amazing music star is a well-entrenched mapping, or if it is a novel ad hoc blend. How conventional is it that *yìyì* is used to depict a quality of people? As it so happens, the same company organizes this music event yearly. In the edition two years after Figure 7, in 2019, a similar strategy of “ideophone + collocate + concert” with even clearer highlighting of the invited singers took place, see Figure 9.

It would be possible to construct a similar prismatic model, but for reasons of space this exercise is left to the reader. The crucial point here is that again, a visual iconic word, *cuǐcàn* 璀璨 'dazzling' depicts the stars, and the stars here are the two singers Weibird and Jia Jia 家家, stretching the meaning from visual 'dazzling' to audiovisual 'amazing' yet again. Thus, the extension is productive and dynamic, resting on invited inferences triggered by the textual input combined with the pictorial input.

Figure 9. Promotional poster for EVA Air's yearly concert for VIPs in 2019 (*Chángróng Hángkōng guìbīn zhī yè* 長榮航空貴賓之夜). The title of the concert is the 'concert of dazzling starsound' (*cuǐcàn xīngshēng yīnyuèhuì* 璀璨星聲音樂會)

4. Not only in ads, also on social media

There is one more issue that needs to be tackled. Up until now, we have been applying the prismatic model (or integrative multimodal metaphor theory) to deliberate mediums in which iconic words were used, i.e., advertisements. To demonstrate that the iconic form-meaning mappings are not always as stable tacitly presumed – the way they are recorded in dictionaries but also used in guessing experiments or ratings – it is necessary to observe the semantic shifts "in the wild". Here, social media can play an important source for materials.

Let us look at a typical collocate-ideophone construction from Mandarin, e.g., *lǜ-yóuyóu* 綠油油 'green-glossy.IDEO.' This word scores very high in familiarity (5.82/6), and higher than average in iconicity (4.16/6) and positive valence (4.36/6), based on ratings conducted by Van Hoey et al. (2024). Social media data enables us to show the visual imagery associated with this visual iconic item, by querying '#綠油油' on Instagram (Figure 10).

Figure 10: Prototypical usage of *lǜ-yóuyóu* 綠油油 'glossy green', obtained on 14/6/2020 on Instragram through the query '#綠油油'

As Figure 10 clearly illustrates, the dominant imagery that people associate with *lǜ-yóuyóu* is that of vibrant green hillsides, meadows, leaves and vegetables, i.e., the natural world. In the search, I also found this item used for matcha-based dishes. Matcha typically lacks the glossiness shown in the panels of Figure 10. It can be seen as a generalization from 'glossy green natural thing' to 'green natural thing'. A much more surprising but entrenched extension involved using *lǜ-yóuyóu* to refer to positive stock numbers. An example (from Twitter before it turned X) is shown in Figure 11.

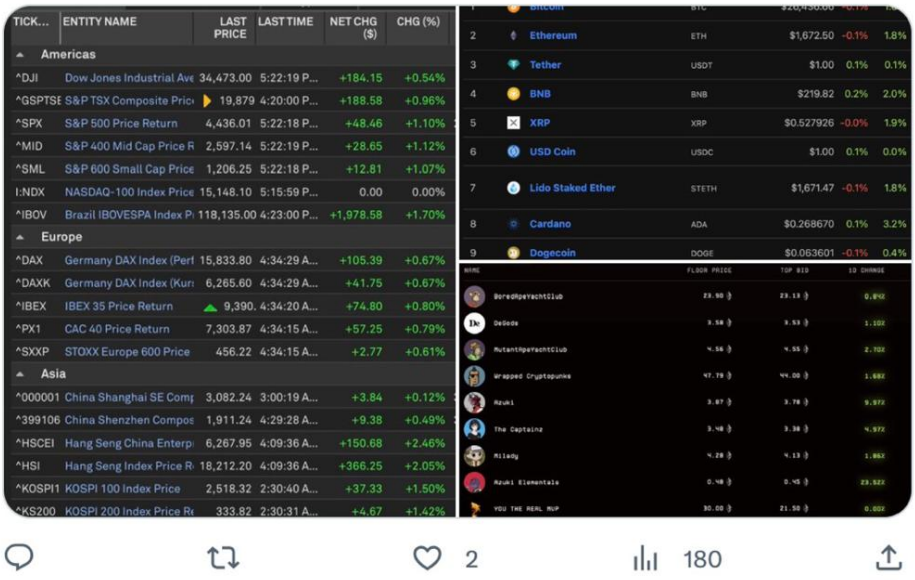

Figure 11. The caption reads "好久没看到股市，币圈小图片一片绿油油了 📈" ['It's been a long time since I looked at the stock market. All cryptos turned vibrant green'], obtained on 24/08/2023 on Twitter through the query '绿油油'

While initially unexpected, the extension of *lǜ-yóuyóu* from the 'glossy green' of the natural world to that of 'good and positive stock numbers' is not unmotivated. When we

untangle this complex metaphor, the prismatic model takes the shape shown in Figure 12. *Lǜ-yóuyóu* in its original meaning is about how an absent referent, let's say '[nature]' is depicted, with green as its main reading. Nature is then metaphorically mapped onto the visual input offered by the screenshots of positive stocks, shown as '[numbers]' in Figure 12. This causes 'green' to also undergo a metaphorical extension to 'positive', supported by a conceptual metaphor like GOOD IS GREEN, instances of which we see all around (traffic lights, fresh vegetables, pharmacies etc.). Together, on the composite level then, 'glossy green' is then extended to 'good, positive numbers.'

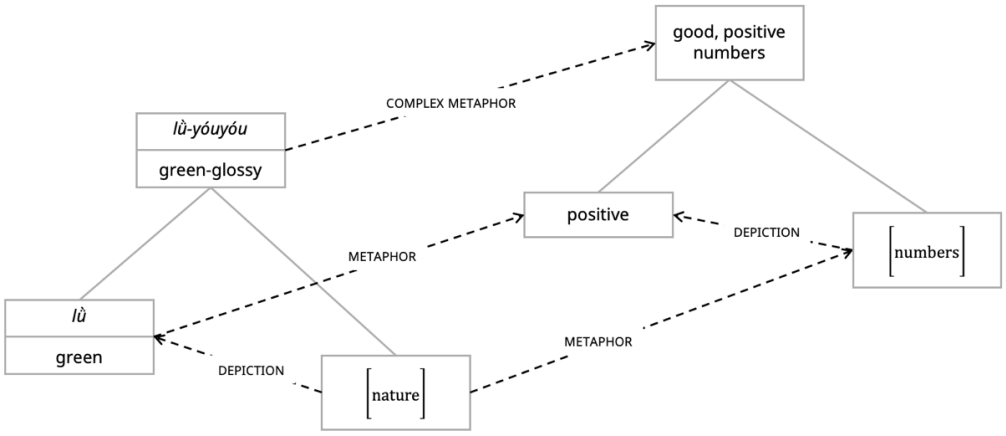

Figure 12: Prismatic model of the semantic extension of *lǜ-yóuyóu* 綠油油 'glossy green' to 'good and positive numbers'

Again, one can wonder if this extension is entrenched or completely ad hoc. Evidence for its entrenchment comes from the antonym of *lǜ-yóuyóu*, *hóng-tōngtōng* 红通通, occasionally being used for the depiction of negative stock numbers, but largely for red garments worn during the Chinese New Year celebrations. This then also means that the mapping from nature/clothes to numbers is not the typical iconic form-meaning mapping associated with these items, but still productive enough to be used over and over.

Conclusion

We started out with the idea that iconic words (onomatopoeia, ideophones and the like) are prime examples of lexical linguistic iconicity, in which word forms reveal something about their meaning. Taken at face value, this may lead to the search for direct mappings between formal segments that make up these words and aspects or features of meanings, all under the assumption that the iconic form-meaning mapping, per definition, is stable. At the same time, we saw that semantic extensions of such items have been catalogued, often invoking constraints on these extensions.

Wishing to investigate how semantic shifts of iconic words happen, we looked at the audiovisual domain, the canonical context in which ideophones are spontaneously produced. In such dynamic contexts, rich in semiotic tools (lexical choice, grammar, prosody, phonation, gesture etc.) it is easy to select the correct iconic form-meaning mapping, e.g., which *polang* is used (Section 1). In visual-only media such as ads, we can also observe shifts in the semantics of iconic words. The Schweppes ad (Section 2) demonstrated that certain forms can be

connected iconically both with a meaning as well as its apparent opposite, really applying stress on the obstinate retention of a fixed iconic form-meaning mapping. The *Boschhhh* example (Sections 2-4) showed how different constituents might operate together to enable those semantic shifts. The first framework (integrative multimodal metaphor) highlighted the main shift and what components are involved to make that shift happen. The second framework (prismatic model) stressed how the components themselves also undergo semantic shifts to aid in the main semantic extension of the composite level.

While it is unclear as of yet to what degree the prismatic model can be applied to iconic words in longer stretches of human speech (clause level or text level)[37], for the lexical level the model was shown to be effective in capturing how, for instance, the iconic 'shining' depiction of starlight gets extended to mean the 'amazing' depiction of the music stars, or how nature's glossy greenness is mapped onto stock numbers on the rise (Sections 3-4). The main conclusion of this paper, then, is that presumed fixed iconic form-meaning mappings of iconic words are not necessarily stable and can easily be semantically extended given the right context. This is not entirely surprising, as these are first and foremost iconic *words*, that behave as words do – prototypicality effects, pragmatic inferences, historical change and so on. Consequently, treating them as unchanging windows into deep language evolution borders on fallacious thinking. If they are windows through which we can still observe how the caveman spoke, we must be sure to realize they are windows, yes, but made from the wooden remains of Theseus's ship.

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[37] I thank an anonymous reviewer for pointing this out.

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Onomatopoeia in phonaesthemic groups: An interplay between iconicity and systematicity in English

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This article explores the phenomenon of phonaesthemic groups in the English language from a diachronic perspective. I argue that phonaesthemic sound symbolism simultaneously employs the mechanisms of language iconicity and systematicity. The creation of phonaesthemic groups results in semantic groupings of the lexicon based on synaesthesia, that is, on conveying impressions of different sensory modalities by sound. Phonaesthemic sound symbolism, thus, is semantically related to other linguistic ways of referring to different sensory modalities, such as ideophones (visual, tactile, olfactory modalities) and onomatopoeia (audial modality). I argue that acoustic and articulatory parameters of speech sounds used to compose a phonaestheme influence the set of (metonymically transferred) meanings they are paired with. The paper provides examples of the semantic development of the English br- and cr- phonaesthemic groups (33 br-words and 53 cr-words), considers their etymology and the pathways of semantic expansion of the respective phonosemantic fields.

Keywords*: phonaesthemes, sound symbolism, onomatopoeia, phonosemantic field, iconicity*

Introduction

The present article explores the phenomenon of phonaesthemic groups, focusing on their formation and expansion. Phonaesthemes occupy an intermediate position between phonemes and morphemes: they are understood as *phonemic clusters* consisting of two, sometimes three, phonemes systematically paired with a certain meaning in a language (after Firth 1930; Householder 1946; Flaksman 2015; Mikhalev 2018). Other scholars define them as *sub-morphemes* (Bolinger 1950; Nida 1951; Bloomfield 1953; Smith 2016). In this regard, ***gl****ance*, ***gl****immer* and ***gl****itter* are suggestive of light or vision, and *br*-words (e.g., ***br****anch*, ***br****ush*, ***br****istle*, ***br****eak*, or ***br****ittle*) are paired with the meaning 'something broken' or 'something sharp'. As phonaesthemic sound symbolism is characteristic of (relatively) small groups of words, it often sparks the discussion whether such phonemic groups are an iconic (non-arbitrary) phenomenon or a result of coincidental (systematic) grouping.

This study aims to illustrate that phonaesthemic sound symbolism is an integral part of the language's *imitative system*. This system is formed by imitative words (that is, iconic words: onomatopoeic, mimetic words, and ideophones), phonemic clusters used iconically (phonaesthemes), and morphemes (used specifically in imitative words, such as iconic prefixes *ka-* / *ker-* found in some English onomatopoeic words such as *ka-boom*, *ker-splash*, etc.) (after Voronin 2006: 22). These elements of the imitative system are motivated by human's sensory experience (acoustic, motoric, mental, etc.) and are interconnected.

Under 'imitative' (iconic) words I understand several classes of words: (1) *onomatopoeic* words which imitate natural sounds rendered by a human by speech sounds of a particular language (e.g., imitations of bird calls, animal cries, etc. – *peep*, *tweet*); (2) *mimetic* words which use the place of articulation of speech sounds to imitate articulatory or 'mimetic' gestures (like hiccupping, coughing, licking, etc. – cf. *hiccup*, *atchoo*);

(3) *ideophones* which depict other impressions from sensory modalities (see examples in Section 1.1)

In this paper I aim to illustrate that: (1) There are considerable structural and semantic overlaps between phonaesthemic sound symbolism on the one hand, and onomatopoeic, mimetic and ideophonic words, on the other. I argue that they employ the same mechanisms (acoustic quality of speech sounds and the place of their articulation) to encode sensory experience of physical and mental nature; (2) Phonaesthemes are instances of both language iconicity and systematicity. I argue that the (historical) core of the studied phonaesthemic groups is comprised of imitative (onomatopoeic, mimetic) words (that is, phonaesthemic groups are iconic) and the periphery of these groups has developed by analogy (a systemic form-meaning matching).

The study relies on the previous works by Marchand (1969), Voronin (2006), and Flaksman (2015, 2020) which explain the correlation between the acoustic parameters of speech sounds and the meanings of onomatopoeic words. It also explores the ability of imitative words (1) to have numerous motivations for nomination (Davydova 2022), (2) to form a range of synonyms with similar forms and meanings by use of sound symbolic phonemic clusters (Shvetsova 2011) and (3) to convey meanings of different sensory modalities (Brang et al. 2012; Ivanov 2022).

The description of semantic structures of the phonaesthemic groups relies on the theory the *phonosemantic field* which unites lexemes "on the principle of both similar meaning and form" (Mikhalev 2018: 229). A phonosemantic field, thus, combines the features of a lexical semantic field and a syntagmatic one, as it "unites similar lexical meanings, which allows to develop the microstructure of a particular semantic fragment of a language", and "focuses on the adjacency relations and co-existence of lexical meanings" (Mikhalev 2018: 230).

The paper is structured in the following way: Section 1 describes iconic mechanisms of word coinage in onomatopoeic and mimetic words as well as in ideophones. It also provides the background for understanding the iconic features of phonaesthemes and the limitations on iconicity in phonaesthemic groups. It further discusses different patterns of interaction within the semantic structure of imitative words, i.e. iconic interference, synaesthesia, and cross-modal shifts. In Section 2, I discuss the principles of phonaesthemic sound symbolism, explain the methodology of the research, describe the research data and principles of their collection (33 *br*-words and 53 *cr*-words), and provide explanations on how phonaesthemic words reflect the mechanisms employed by other units of the language's imitative system on the material of the *br*- and *cr*-phonaesthemic groups in English.

1. Iconic imitation by word coinage

1.1 Iconic imitation: An overview

By IMITATIVE WORDS I understand three types of iconic words which demonstrate different patterns of word coinage: (1) onomatopoeic, (2) sound symbolic / mimetic words, and (3) non-onomatopoeic and non-mimetic (synaesthetic) ideophones. Note that some of the phonaesthemic words can be at the same time onomatopoeic or mimetic (Flaksman 2024a).

(1) ONOMATOPOEIC words imitate *natural sounds* by means of speech sounds with similar *acoustic characteristics*. Voronin (1998: 18–19) argues that "the challenge is not just to pair the way an onomatopoeic word sounds to its denotatum […] but to trace exactly which

acoustic characteristics of the denotatum determine the choice of a particular speech sound comprising this onomatopoeic word". For example, the word *bang* [bæŋ], [baŋ] 'a sudden, violent or explosive noise' (OED) is a "compound", where a plosive consonant [b] refers to the bluntness of the sound, a (near-)open front vowel [æ] / [a] "renders the sound of slamming" and a velar nasal [ŋ] is used to imitate the vibration of the air following the sound (Marchand 1969: 402). Thus, onomatopoeic words use pre-speech *cognitive metaphor* to copy the acoustic features of the natural sounds which one perceives (after Davydova 2022).

(2) SOUND SYMBOLIC / MIMETIC words (Hinton et al. 1994; Voronin 2006) use speech sounds to denote human sensory, emotive, or mental processes or sizes, or shapes, or movements of external objects (but unlike ideophones – cf. Voeltz et al. 2001 – they are not marked and largely syntactically integrated). They are variously termed "mimetic" (Flaksman 2024a), "corporeal" (Hinton et al. 1994), or "kinaesthetic" (Anderson 1998). Mimetic words employ *place of articulation* of speech sounds for imitation (Flaksman 2024a). There are two types of sound symbolic / mimetic words:

(2a) MIMETIC WORDS-INTRAKINESEMISMS are *articulatory gestures* imitating speech apparatus movements used for non-speech production purposes (SAMs) by means of speech sounds with similar *place of articulation* (Flaksman 2024a). E.g., the word *mwah* [mwɑː], [mwa] 'an exaggerated kiss, esp. one given on the cheek to a social acquaintance; an air kiss', 'to kiss in exaggerated fashion, esp. on the cheek; to give air kisses' (OED) uses a labial [m] followed by one more labial [w] articulated with rounded lips; both sounds refer to the articulation of the kissing movement (ibid.). Long open vowel [ɑː], like other long vowels in verbs of movement, "go[es] with slow or long movement" (Marchand 1969: 401), while both [ɑː] and [a], articulated with not strained lips, probably refer to the moment when the breath is let out. Thus, mimetic words-intrakinesemisms are always coined by "pre-speech *cognitive metonymy* and wholly reproduce the specificity of the mouth articulation patterns to imitate coughing, yawning, specific exhaling, etc." (Davydova 2022: 203), or, to summarize, the speaker's mimics and articulatory gestures.

(2b) MIMETIC WORDS-EXTRAKINESEMISMS imitate *non-acoustic objects and processes* of the world outside the human body, e.g. shape, size or motion specificity (Voronin 2006: 71), therefore, the parameters that are perceived visually are expressed by means of articulation. For instance, small objects are often denoted by words containing [i], the "smallest" vowel by the parameter "mouth opening". This tendency is registered in various languages in words meaning 'small, little': cf. *teeny* [ˈ**ti**ːni], *tiny* [ˈtʌɪni] ([**i**ː] > [ʌɪ]), *little* [l**ɪ**tl]; Italian *piccolo* [ˈp**i**k.ko.lo], Finnish *pieni* [ˈp**i̯e̯**ni], Hawaiian *li'ili'i* [l**i**.ʔ**i**ˈl**i**.ʔ**i**] (examples from Davydova 2022: 164), Indonesian *kecil* [kəˈtʃ**ɪ**l], Greek *μικρό* [m**i**ˈkro]. Round objects, on the other hand, are frequently denoted by words containing labials, cf. *blob* [**blɒb**] 'a drop', *bubble* [**bʌb**l] 'a thin membrane of liquid', 'bubbles usually take the form of a sphere' (OED), Latin: *bulbus* [bul.bus] 'bulb (especially an edible bulb such as the onion)', Russian *пузырь* [**pʊ**ˈzɨrʲ] 'bubble'.

(3) The term "IDEOPHONE" is used to indicate a class of marked lexemes that represent sensory impressions by means of a spoken language. Thus, they express ideas of "sensory imagery" (Dingemanse 2012: 655) covering perceptions of the external world, inner sensations and feelings. They may denote a specific gait (Udmurt ***лы***шык-л***а***шык [l**ɨ**ʃɨk l**a**ʃɨk] 'to shuffle', Mountain Mari *кызырге* [kɨzɨrge] 'to move stealthily'), or irregular shape (Komi-Zyrian ***шлю***ч-шл***я***ч [ʃlʲ**y**tʃ ʃlʲ**a**tʃ] 'dangling, unfixed'), as well as emotional or mental condition (Udmurt Beserman *кепыр* [kepɨr] 'feeling awkward being rejected, feeling emotionally uncomfortable for a certain reason') (examples from Ivanov 2022: 81, 83). Ideophones (in languages where they are defined as a lexical class) also include non-integrated

onomatopoeic and mimetic words-intrakinesemisms and (to some extent) extrakinesemisms. Cf. the English words that denote motion (with [w] for oscillation in *twitch* [t**w**ɪtʃ] ‘a sudden sharp feeling of physical or mental pain or discomfort’ or [r] for rotation in *whirl* [wəːl], [(h)wə**r**l] ‘to circle, circulate’), tactile perception ([r] or a fricative for something harsh in *rough* [**ɹ**ʌ**f**] ‘having an uneven or irregular surface’). The means of imitation in non-onomatopoeic and non-mimetic ideophones is synaesthetic (Flaksman 2024a).

Ideophones have a number of peculiar ‘marked’ formal traits: reduplication (Moksha *дубор-дубор* [dubor.dubor] ‘stomping’), metathesis (Moksha *чатор* [**tʃ**a**t**or] and Udmurt Beserman *мачыр* [**t**a**tʃ**ir] for ‘a crack’), vowel change (Komi-Zyrian *брин* [br**i**n], *брун* [br**u**n], *бран* [br**a**n] for a jingle, each variant correlating with the pitch). They may also appear as marked units by means of breaking the phonotactics rules existing in a language: in Komi-Zyrian [x] and [f] are never employed unless in loanwords and ideophonic verbs (*хыр-гыны* [xir.gɨnɨ] ‘to wheeze’ instead of a ‘normal’ form *киргыны* [kirgɨnɨ]). Vowel lengthening and gemination can also be used (examples from: Ivanov 2022: 28, 96, 111).

These words are usually not declined and are not subject to change grammatically according to the other words that they interact with (ibid.):

(1) Moksha дубор-дубор ласьк-их-ть ит-т-не
IDEO run-PRS.3-PL child-PL-DEF
Children are running and stomping. (Ivanov 2022: 28)
(Lit. ‘With rattle are running children.’)

(2) Moksha дубор-дубор ард-ы
IDEO go-NPST.3(SG)
It is rattling forward. (Ivanov 2022: 28)
(Lit. ‘With rattle is going.’)

Examples (1) and (2) illustrate how a single ideophone *дубор-дубор* [dubor.dubor] ‘the sound of stomping, rattling, crashing’ can be used as (1) an adverb and (2) an interjection (Ivanov 2022: 28). In both cases the acoustic parameter of the event in question is expressed *lexically* by a word that is syntactically independent.

(3) Mari рвезе кыж-кож төршт-ен кынел-еш
boy IDEO jump-CVB stand-up-NPST.3SG
The boy jumped up sharply (stood up by a quick jump). (Ivanov 2022: 30)
(Lit. ‘Boy quicky having jumped up stood up.’)

In a sentence, ideophones are usually placed next to a verb, as illustrated in examples (1), (2), and (3). However, they may sometimes act as attributes to a subject: cf. Mari *выче-выче вараксим-же* [vitʃe.vɨtʃe varaksim.zɛ] ‘a spotted swallow’ (Ivanov 2022: 30), where *выче-выче* is an ideophone that literally means ‘chirping’. Thus, an ideophone with an onomatopoeic meaning is used to refer to visual perception of something speckled and patchy.

These three classes of imitative words (onomatopoeic, mimetic, ideophones) employ the language mechanism of word coinage determined by human sensory perception and an attempt to express the link between the form of the word and its denotatum. Onomatopoeic and mimetic words (also onomatopoeic and mimetic ideophones) constitute the core of a language’s imitative system and are found in languages across the globe: English (Bolinger

1950; Marchand 1969; Voronin 1998; Flaksman 2024a), German (Habok 2009), Japanese (Iwasaki et al. 2007; McCawley 1968), Komi, Moksha and other Finno-Ugric (Ivanov 2022), Ossetian (Abaev 1956), Quechua (Nuckolls 1996), Russian (Shlyakhova 2006), altogether in over seven thousand languages (Blasi et al. 2016). I claim that phonaesthemic words are on the periphery of the imitative system of language, but they, at the same time, share some traits with the three groups of words discussed above. To reveal this link, let us first study the mechanisms of imitation by onomatopoeia and mimesis.

1.2 Iconic imitation: Onomatopoeic words

The sound perceived by a human may be characterized by a number of parameters: pitch, volume, time, periodicity and dissonance (Voronin 2006: 39–40; Flaksman 2020: 133). As a sound is processed (psycho)acoustically simultaneously and as large categories, these parameters may be combined and classified as (1) a pulse, (2) a non-pulse, and (3) a dissonance. According to Voronin (2006), *pulse* is an 'instant' sound (e.g., clapping, hitting), expressed most commonly by plosive consonants in English (e.g., ***t**ick*, ***t**ock*). *Non-pulse* is a 'non-instant' sound, such as tone or noise, tones (e.g., whistling) and noises (e.g., hissing) are imitated by nasal sonorants (***m**oo*, *boo**m***) and fricative consonants (***h**iss*, ***f**izz*) respectively. *Dissonance* is 'a type of sound when the pulse series is long enough to be perceived as a durative sound but is too rapid for the ear to distinguish the individual pulses' (e.g., sound of a car engine) (Voronin 2006: 74). This repetitive pattern is expressed by a trilled [r] due to the manner of its articulation and ensuing acoustic (vibratory) quality (***r**oa**r***, ***r**ing*). It may happen that the dissonant sounds may be imitated by an approximant [ɹ], as the quality of a sound changes historically like it happened in English.

1.2.1 Consonants in onomatopoeic words

The way a language imitates the sounds is determined by its phonetic system and the acoustic features of the sounds. Therefore, languages with similar phonemic inventories exhibit similar ways of sound-imitation. Thus, plosive consonants most commonly imitate abrupt sounds or hits in English, but also in other languages having plosives in their inventories: cf. *tick* [**tɪk**] 'a quick light dry sound [...] as that caused by the *sudden impact* of a small *hard* body *upon a hard surface*' (OED), *klop* [**k**lɔ**p**] 'the sound of the *impact* of something *solid* on a *hard surface*' (OED), Icelandic *stappa* ['s**t**a^{h}**p**a] 'to stomp, to tap', Russian *кап-кап* [**k**a**p**.**k**a**p**] 'the sound of raindrops falling''. Nasal sonorants are likewise used to imitate low continuous tones in different languages: *murmur* ['**m**ə:**m**ə] 'to complain in *low* muttered *tones*; to make a *low continuous sound*' (OED), *plonk* [plɔ**ŋ**k] 'an abrupt, hollow, *resonant noise*, esp. as that emitted from a musical instrument' (OED), Spanish *murmurar* [**m**uɾ**m**uˈɾaɾ] 'to murmur' (both borrowed from Latin). Rustling noises are imitated by use of fricatives: *siffle* [**sɪf**l] 'to blow with a *sibilant* sound; to *whistle, hiss*', *siss* [**sɪs**] 'to hiss, make a hissing sound' (OED), Icelandic *sussa* [**sys:**a] 'to hush, shush' (after Flaksman 2024b: 34). The [r] sound is responsible for "continuously vibrating sounds" (Marchand, 1969: 399), also harsh or repetitive sounds in many European languages including Standard English.

This can most clearly be seen in *pu**rr*** [pəː] < [pʊr] 'of a cat or another feline animal: to make a low, continuous, *vibratory* sound' (OED), Icelandic *korra* ['ko**r:**ɒ] 'to rattle, rattling' (Flaksman 2024b: 34), French *gronder* [g**ʁ**õ.de] 'to roar', Spanish *crujir* [k**ɾ**uˈxiɾ] 'to creak, to rustle'.

1.2.2 Vowels in onomatopoeic words

The choice of a vowel in an imitative word is determined by the pitch, volume, and timbre of the imitated sound (Marchand 1969: 400).

A high, or thin, tone is rendered by front vowels [i], [y], [ɨ], [ɪ], [ʏ], [e], [ø]. This can be observed in words like *ting* [t**ɪ**ŋ] 'to emit a *thin*, clear, usually *high-pitched* ringing sound, as when struck; to ring' (OED), *peep* [p**i**ːp] 'to utter the faint, *high-pitched* sound of a young bird or mouse' (OED), Spanish *chillar* [t͡ʃ**i**ˈjaɾ] 'to shriek, to screech, to creak', Russian *писк* [p**i**sk] 'a beak, a high-pitched sound emitted, e.g., by a mouse or a device'.

Rendering low pitch, by contrast, occurs through back vowels [ʉ], [ɯ], [u], [ʊ], [ɘ]. [ɵ], [ɤ], [o], [ɜ], [ɞ], [ʌ], [ɔ], [ɑ], [ɒ]. This can be seen in words like *plop* [pl**ɒ**p] 'an abrupt *hollow* sound, as of a small solid object dropping into water without a splash' (OED), *bawl* [b**ɔ**ːl] 'to shout at the top of one's voice, with a loud, full, protracted sound' (OED), *croon* [kr**u**ːn] 'to utter a continued, loud, deep sound' (OED), Russian *вой* [v**ɔ**j] 'howl, yowl (prolonged low-pitch cry of canines), low-pitch noise of siren, wind', French *grondement* [gʁ**ɔ̃**d.mɑ̃] 'grumble; rumble (noise)'.

Loud and long sounds are rendered by a lengthened vowel or a diphthong (Marchand 1969: 400). They are usually at the same time mid, open-mid or open, vowels like [ə], [ɛ], [œ], [ɜ], [ɞ], [ʌ], [ɔ], [æ], [ɐ], [a], [ɶ], [ä], [ɑ], [ɒ]. This can be observed in *groan* [gr**əʊ**n] 'to breathe with a *deep-toned* murmur; to utter a *low* deep sound expressive of grief or pain' (OED), *growl* [gr**aʊ**l] 'to utter a *low* guttural sound, expressive of rising anger' (OED), Old Icelandic *ýla* [**iː**la] 'to howl, whine, toot' (Flaksman 2024b: 47).

Short vowels are used to render short noises, e.g., *crack* [kr**a**k] 'an imitation of the *sharp sound* caused by the *sudden* breaking of anything hard' (OED), *tick* [t**ɪ**k] 'a *quick* light dry sound, distinct but not loud, as that caused by the *sudden* impact of a small hard body upon a hard surface' (OED), French *frapper* [fʁ**a**.pe] 'to hit, to strike, to knock'.

Each onomatopoeic vocabulary within a language is a system, therefore, a particular language demonstrates systematicity in the way it renders sound parameters. The pattern of imitation existing in a particular language is, however, restricted by its inventory and phonotactic constraints. It is observed that harsh and vibrating sounds are often imitated by a (trilled) [r], e.g., *roar* [**r**ɔː] 'a full, deep, prolonged cry uttered by a lion or other large (typically wild) animal', Russian *рык* [**r**ik] 'a roar', Slovak *hrk-hrk* [h**r**k.h**r**k] 'a rattling sound'. Meanwhile, the Chinese sound system imitates such sounds by means of affricates, e.g., [t͡ʂ]: Chin. (M) 吱吱 (*zhizhi*) [t͡ʂit͡ʂi] 'imitation of a door creaking' (Flaksman 2024b). In Vietnamese, we find alveolar approximant [l] to be used for imitating the same acoustic parameter, i.e. Vietnamese *lúc lắc* [luk˧˥.lɑk˧˥] 'a rattling sound'.

Thus, onomatopoeic words demonstrate iconicity and systematicity simultaneously: they imitate acoustic parameters of natural sounds by imitation while using a certain pattern formed within a particular language which is shaped by its (arbitrary) rules and limitations.

1.3 Iconic imitation: Mimetic words

While onomatopoeic words imitate sounds perceived by a human by means of acoustic interpretation, mimetic words are articulatory copies of physiological processes, i.e. smiling, coughing, kissing, etc. In these words, the place of articulation of speech sounds "coincides

with the place of articulation of the denoted actions. For example, lip movements are imitated with bilabial or labio-dental consonants and rounded vowels" (Flaksman 2024b: 44). Therefore, labial [m] and rounded [uː] and [ʊ] render the kissing motion in such words as *smooch* [s**mu**ːtʃ] 'a kiss' or *smouch* [s**maʊ**tʃ] 'kiss, a buss' (OED). Cf. also Icelandic *spýta* [ˈs**p**iː**t**a] 'to spit' where bilabial [p] and alveolar [t] render the articulation of the spitting motion.

Mimetic words thus make use of certain sounds grouped by their place of articulation: labial consonants to imitate the lips' motion (*mwah* [**m**wɑː] 'an exaggerated kiss', French *bisou* [**b**i.zu] 'a kiss'); dental, alveolar, and postalveolar render the use of the teeth (*nag* [**n**ag] 'to gnaw, to nibble', *snatch* [**sn**a**tʃ**] 'to make a sudden snap or bite'); throat articulation is imitated by velar, uvular, pharyngeal, and glottal sounds (*heck* [**h**ɛk] 'to cough slightly', E. *gulp* [**g**ʌlp] 'to swallow in large draughts or morsels hastily or with greediness', Russian *xpan* [**x**rap] 'snoring'); dental, alveolar and retroflex approximants render the use of the tongue (*gulp* [gʌ**l**p] 'to swallow', Icelandic *smella* [ˈsmɛ**tl**a] 'to click').

Composite motions are rendered by means of the sounds that correspond to their constituent elements, e.g., *spit* (see above in Section 1.3). The word *snore* [snɔː] also implies gradual imitation of air passing through the mouth (fricative [s]) and nasal cavity and the tongue being attached to the palate (nasal alveolar [n]), the uvula vibration (approximant [ɻ] in U.S. English / trilled [r] in some accents). In Spanish *tiritar* [ti**ɾ**iˈtaɾ] 'to shiver' we observe [ɾ] used to imitate vibrating motion.

1.4 Iconic interference: syntheticism and synaesthesia (cross-modal shifts)

Sound symbolic / mimetic words sometimes simultaneously denote both an articulatory gesture and a sound accompanying it. This phenomenon is termed ICONIC INTERFERENCE. It takes place when "several motivations for nomination (and the respective means of imitation) are combined in one imitative word" (Davydova 2022: 133). This can be observed in words like *puff* [pʌf] 'the action of puffing; a sudden brief burst of wind or expelled breath', 'the sound of a small abrupt or explosive emission of air; a similar short, explosive sound' (OED), which imitates (1) an articulatory gesture of blowing and exhaling by means of a *labial* [p] and [f] and (2) the sound accompanying this motion by use of a low-pitched [ʊ] (> [ʌ]). Another example of such interference is the word *giggle* [gɪgl] 'to laugh continuously in a manner not *uproarious*, but suggestive either of foolish levity or uncontrollable amusement' (OED). It imitates both the sound pattern of the high-pitched laugh by means of a high-pitched [i] and the articulatory gesture of laughing, again, by use of [i], which is a close vowel that requires mimicking a smile to articulate, a velar [g] which renders the use of the throat (after Flaksman 2024a). The [g] sound reduplication paired with an L-formant (*-le*) are used to imitate the continuous and repeated character (on L-formants – see Bartko (2002: 9)).

The mechanism of imitation is not restricted by one modality, or category of sensory perception: an onomatopoeic word denoting a sound and a mimetic word denoting an articulatory gesture may also describe shape, size, light, taste, or smell. This phenomenon is known as SYNAESTHESIA, "an involuntary experience in which stimulation of one sensory modality produces additional, atypical sensory experiences in either the same or a separate modality" (Brang et al. 2012: 630). For instance, *bling* [blɪŋ] '(a piece of) ostentatious jewellery, hence: wealth; conspicuous consumption' (OED) demonstrates how the visual and sound characteristics overlap in a word. OED points out its "probably an imitative or expressive formation, apparently representing the *visual* effect of light being reflected off precious stones

or metals". HARP also assumes it is "a *sound* suggestive of the glitter of jewels and precious metals (cf. German *blinken* 'to gleam, sparkle')" (HARP). *dodder* ['dɒdə] 'to *tremble* or shake from frailty; to proceed or move unsteadily or with *tottering* gait' (OED) renders both tactile and visual modalities. Such cases when two or three parameters or aspects of different sensory modalities overlap, relate to the CROSS-MODAL SHIFT (Flaksman et al. 2022: 124). Non-onomatopoeic and non-mimetic ideophones discussed in Section 1.1 are largely examples of synaesthesia.

Therefore, cases of phonosemantic interference and cross-modal shifts illustrate the human cognitive ability to metaphorically interpret the sound symbolic mechanisms to introduce systematic solutions for word nomination.

1.5 Iconic imitation: general remarks

To summarize, iconic words tend to maintain the connection between the form and the lexical meaning. This iconic connection is perceived most "directly", or visibly, in onomatopoeic words that render natural sounds by means of the phonemes with corresponding acoustic parameters. Iconicity appears to be less prominent in mimetic / sound symbolic words that imitate speech apparatus movement via articulation. Least iconic are words that depict human sensory, emotive, or mental processes or features of external objects (sizes, or shapes, or movement specificity),cf. Dingemanse's (2012) implicational hierarchy of ideophones.

It appears that imitative words of all these three groups (onomatopoeic, mimetic, ideophonic) are iconic to some extent and at the same time partly arbitrary as they are shaped by arbitrary, systemic limitations of a language (phonotactic and inventory restrictions), which result from history and tradition. It also appears that the proportion of words of these three groups within a language may be different from language to language (see Dingemanse 2012).

In Section 2, I will compare the mechanisms of iconic imitation employed by these classes of imitative words to those employed in phonaesthemic words.

2. Phonaesthemic sound symbolism and its place in the imitative system of a language

2.1 Phonaesthemic sound symbolism: An overview

Phonaesthemes inherit and develop the mechanism of word coinage using both imitative (iconic) and systematic principles. Still, the phenomenon itself presents a number of challenges.

The term PHONAESTHEME was first introduced by J. R. Firth (Firth 1930) and has been much debated since then. In this paper, a phonaestheme is understood as "a phonemic cluster consisting of two, sometimes three, phonemes systematically paired with a certain meaning in a language". I define the following characteristic traits of phonaesthemic words:

(1) Phonaesthemic sound symbolism is characteristic of *groups* of words only; for instance, ***gl****ance*, ***gl****immer*, and ***gl****itter* are suggestive of light or vision (e.g., reflected light, smooth surface reflecting light, etc.). Single words cannot be phonaesthemic.

(2) Not all words containing the typical consonant clusters belong to phonaesthemic groups but only those united by a certain (common) meaning, e.g., *br*-words: ***br****anch*, ***br****ush*, ***br****istle*, ***br****eak*, or ***br****ittle* are regarded as containing a phonaestheme and are united by the seme *something sharp*, while *brolly* 'an umbrella' or *broad* do not demonstrate any sound symbolic meaning and are excluded from the present discussion.

(3) Phonaesthemic groups may be younger than the oldest words comprising them. Thus, diachronically, the oldest words from such groups might not have originally contained the phonaestheme at all (e.g., many of the *bl-* words are traced back to the PIE base **b^{h}el-* 'blow'). They might also have been (re)borrowed from other languages where they were not members of any phonaesthemic groups, e.g., ***scr**ibble* 'to write […] quickly or carelessly' is traced back to Latin *scrībere* 'to write', but was probably influenced and then attracted to the group of English *scr*-words paired with the meaning "a sharp or harsh movement or sound" (***scr**atch*, ***scr**awl*). These data question the time when a combination of phonemes becomes a phonaestheme.

(4) A phonaestheme often *synaesthetically* renders a number of meanings from different sensory modalities through sound (just as ideophones discussed in Section 1 do); cf. ***gl**ance* 'a sudden movement producing a *flash* or gleam of *light*; also, the flash or *gleam* itself', 'a brief or hurried look', 'a swift oblique *movement* or impact' (OED).

It appears that a language's sound-imitative system, which is the sum of all its imitative elements, expanding through phonaesthemic groups triggers further sensory associations, thus making it possible to form phonaesthemic groups with even more pronounced and multi-faceted synaesthesia than in onomatopoeic, mimetic words, and even in ideophones. Consider the following examples from the English language:

(i) vision, light, colour, or texture: *gl*-words (***gl**ass*, ***gl**aze*, ***gl**immer*, ***gl**itter*, ***gl**isten*)

(ii) texture, movement, or speed: *br*-words (***br**ush*, ***br**amble*, ***br**isk*, see Section 2.4 for more detail)

(iii) movement, colour, or sound: *bl*-words (***bl**are*, ***bl**ow*, ***bl**izzard*, ***bl**ush*).

Therefore, as suggested in Flaksman (2025: 33, in print), phonaesthemic words occupy the *semantic niche* of ideophones (see Section 1.1).

Thus, phonaesthemic words are iconic, although their iconicity is of more diffused, peripheral, indirect nature.

Also, phonaesthemic words are *perceived as iconic* in psycholinguistic experiments. Pimentel et al. (2019) note that "phonaesthemes have psychological import; they can be shown to accelerate reaction times in language processing" (Hutchins 1998; Bergen 2004).

2.2 Research material and methods

Further discussion will be illustrated by my study and comparison of *br-* and *cr*-phonaesthemic groups in English. The studied 33 *br-* and 53 *cr*-words were obtained by continuous sampling from OED. Altogether, 3681 words containing the *br-* initial cluster and 3702 words containing the *cr-* initial cluster were analysed to find 33 *br*-words and 53 *cr*-words that would comply with the criteria for defining phonaesthemic groups (see Section 2.1). Compound words were not included into the study.

The historical-comparative method and the phonosemantic analysis and methods of etymology were applied in the research.

In the next paragraphs, I discuss how phonaesthemes are related to the other classes of imitative words, which is deemed to illustrate common tendencies that determine iconic processes in language.

2.3 Field structure of lexical groups: Core and periphery of the imitative system

Field semantics is a convenient instrument to provide graphic representations of lexical groups' inner structure. A field consists of a core, or nucleus that represents its general idea, and periphery which results from semantic development of the core. Mikhalev (2018) applied the idea of the field form of vocabulary organization to phonaesthemic words and introduced the notion of the PHONOSEMANTIC FIELD. He claims that the formation of this field is based on both lexical-semantic fields and syntagmatic fields thus combining the principles of uniting lexical meaning patterns and adjacency (ibid.: 230). He also argues that "iconic meanings serve as derivational ideas" (ibid.: 223).

A study by Shvetsova (2011: 81–83) has shown that already existing imitative words in English dialects are able to trigger the coinage of new ones. Such words combine onomatopoeic and sound symbolic features and thus may form a range of synonyms with similar word forms. This was shown through research based on (mimetic) words describing physiological processes originating in the oral cavity. English speakers were asked to name a number of words by their definition for the original dataset in Orton (Orton & Halliday 1962). Respondents were asked to name a process of eating an apple or a cookie noisily, expecting *crunch* or its equivalent as an answer. A list of obtained answers included such words as ***cr****unch*, ***gr****unch*, ***cr****onch*, ***cr****aunch*, ***gr****aunch*, ***cr****ack*, ***cr****ush*, ***cr****esh*, ***gr****esh*, ***cr****anch*, ***cr****ounge*, ***cr****unge*, ***gr****ind*, ***gr****anch*, ***gr****owze*, ***gr****oedge*, ***gn****aw*, ***r****aunch*, ***fr****aunch*, ***scr****unch*, ***scr****anch****, m****unch*. These responses form a list of imitative synonyms which differ by one (or, rarely, two) phonemes. All of them render the noisy impact of the jaws' motion by the choice of initial and final sounds. They may contain a voiced [g] or a devoiceless [k], both velars referring to the throat motion and to the pressure which accompanies their articulation, a trill [r] or an approximant [ɹ] to render the harshness and loudness, a fricative [ʃ], or an affricate [tʃ], or [dʒ] to enhance noise imitation as well as the choice of open vowels ([ʌ], [ɔː], [a], [ɑː]) in most cases. Besides, Shvetsova (2011) concludes that the word choice was determined by the subjective feeling of each respondent of how hard the "crunched" food was and how "energetic" the crunching was. She terms such groups of words "*phonosemantic synonyms*", and the most frequent, "model" word in a group – "hyper-lexeme" (in this case – *crunch*).

Shvetsova's (2011) study demonstrates how a language forms semantically united groups of words, not derived by one another historically, having a similar word form by iconically using the sounds with similar parameters. Such groups are united into a phonosemantic field, where the centre is formed by an ICONIC HYPER-LEXEME, a semantic invariant of the word list with the general meaning (*crunch*), and its phonosemantic synonyms and variants that differ in one sound only (*cr****au****nch*, *cr****a****nch*, *cr****u****nch* etc.). The periphery of the field is formed by other words with more differences in word form that show the shades of meaning by use of different sound clusters.

This case study (Shvetsova 2011) may lead us to a better understanding of the phonaesthemes. Semantically, a phonaesthemic group is often represented as a field, or a "constellation of meanings", as Sadowski terms it in his study of English *gl*-words (Sadowski 2001: 77). He claims that "the sound-symbolic nucleus is formed by the largest group denoting 'light', naturally connected with 'looking' or 'seeing' by means of such link-words as *glance*, *glare* and *glent*". He also places the seme 'moving lightly' (in *glance* and *glent*) and 'sight', 'quick, light movement' (in *glint*) in the core of the field. Further association of 'light' with 'joy' (in *glad*) and 'splendour' (in *glory*) add more words to the periphery of the field (Sadowski 2001: 77–78). Sadowski also notes that diachronically, a major part of

iconically significant words in Old English refer to ‘light’, ‘brightness’, and ‘shining’ to prove his idea of the sound-symbolic nucleus (Sadowski 2001: 78).

The latter idea was later confirmed by Mikhalev who showed that diachronically, the genetic core is formed by imitative words (onomatopoeic or mimetic) and the periphery – by those expressing adjacent synesthetic meanings (Mikhalev 2018: 196).

I propose applying this idea of core-periphery structure (Sadowsky 2001; Shvetsova 2011; Mikhalev 2018) to the study of English *cr-* and *br-* phonaesthemic groups, as in the following section.

2.4 Syntheticism and synaesthesia in phonaesthemes

Phonaesthemes may pair onomatopoeic (‘sound’) and sound symbolic semes (‘other sensory impressions’) within a word in the same way as it is observed on onomatopoeic and mimetic words. This tendency was previously described (see Section 1.4) on the examples of *puff* and *giggle*).

To make it more credible, we may observe more examples. Thus, in *bang* (1) ‘a heavy resounding blow, a thump’; (2) ‘a sudden, violent or explosive noise’; (3) ‘a sudden impetuous movement’ (Flaksman 2024a: 122) we may observe the *sound* imitation by rendering its resonant quality, its abruptness and loudness, while these parameters are also attributed to respective *motions*. In *jabber* ‘(1) to talk rapidly and indistinctly or unintelligibly’; (2) ‘to speak volubly and with little sense; to chatter, gabble, prattle’ (Flaksman 2024a: 315) the speech articulation is imitated by use of labials and the repetitive and abrupt quality of exposed sound is rendered by use of a plosive and short vowels. Thus, *bang* and *jabber* synaesthetically imitate (and combine in their structure) the idea of ‘sound’ and the idea of ‘motion’.

In the same manner, some words containing a phonaestheme may also combine sound-rendering semes with symbolic ones. I propose that a phonaestheme’s potential for semantic development is influenced by *quality* of speech sounds comprising it.

Consider, for instance, phonaesthemic *cr*-words which are usually paired with the idea of “something broken”, often accompanied with a sound (***cr****ack* [krak], [kræk] ‘a sudden sharp and loud *noise* as of something *breaking* or bursting’, ***cr****ash* [kraʃ], [kræʃ] ‘to break in pieces with violence and noise’). ‘something broken’ or ‘uneven’ may also be metonymically extended to ‘something rough’, ‘jagged’,, ‘scratching’, or even ‘irregular’ (***cr****ate* [kreɪt] ‘a large case, *basket*, or hamper of *wicker-work*, for carrying crockery, glass, or other goods’, ***cr****ab* [krab], [kræb] ‘of hawks: to scratch, claw, or fight with each other’), and also to ‘something compressed’ or ‘twisted’ (***cr****amp* [kramp], [kræmp] ‘an involuntary, violent and painful *contraction* of the muscles, usually the result of a slight *strain*, a sudden chill, etc.’; ***cr****eak* [kri:k] ‘to make a harsh shrill grating *sound*, as a hinge or axle turning with *undue friction*, or a hard tough substance *under pressure or strain*’).

I consider that the starting point for all the associations listed above is the fact that the *cr-* cluster is composed of a velar voiceless plosive [k] and a postalveolar approximant [ɹ̠]. Plosive consonants in English onomatopoeic words render *abrupt* sounds (Flaksman 2024b); in phonaesthemic words the meaning ‘abrupt sound’ transfers to ‘abrupt processes or action’ (e.g., *crack* ‘originally, an imitation of the *sharp sound* caused by the *sudden* breaking of anything hard’, starting from the 19th century – ‘a *sharp*, heavy, sounding *blow*’). The pressing articulation of a velar consonant influences expressed meanings connected with the use of force (e.g., *creak* ‘to make a harsh shrill grating sound, as a hinge or axle turning with *undue friction*, or a hard tough substance *under pressure* or strain’; *creem* ‘to squeeze’, crouch ‘to stoop or

bend low with general *compression* of the body'). The approximant, which probably inherits the qualities attributed to a trill [r] that used to be pronounced in this position before vocalization, imitates a vibrating, harsh, dissonant sound in English onomatopoeic words; in phonaesthemic words it serves to refer to the feeling of a harsh or sharp surface (*crate* 'a large case, *basket*, or hamper of *wicker-work*', *cradle* 'a little bed or cot for an infant: […] a simple cot or *basket*-bed').

The *br-* phonaestheme is also composed of a plosive and of [ɹ̲]. The use of a voiced bilabial [b] adds abruptness to the words of this group. The semes expressed by it are: "something broken" (***br****eak*, ***br****ittle* [brɪtl] 'hard but liable to *break* easily; fragile, *breakable*'), "something sharp" (***br****amble* [brambl], [bræmb(ə)l] 'a rough *prickly* shrub; spec. the blackberry-bush', ***br****ush* [brʌʃ] 'a utensil consisting of a piece of wood or other suitable material, set with small *tufts* or bunches of *bristles*, hair, or the like'), "something loud and irritating" (***br****ag* [brag], [bræg] 'to vaunt, talk *boastfully*, *boast* oneself', (obs.) 'of a trumpet: to sound *loudly*; also, to make a *loud sound*', ***br****awl* [brɔːl] 'to quarrel noisily and indecently'), "something sudden" (***br****ash* [braʃ], [bræʃ] 'hasty, rash, impetuous; hard, harsh, rough', 'active, quick', (obs.) ***br****aid* [breɪd] 'to make a sudden jerky movement').

The change of the quality of the speech sound from a trill (Middle English) into an approximant (Early Modern English) might have been the reason why the number of new words of phonaesthemic groups coined after Middle English (in British English) later decreased. Only a few new words can be found after the 19th century: ***br****adawl* for something sharp 'a kind of small boring tool, a sprig-bit' (< *brad*), ***br****ash* for something sudden or loud 'hasty, rash, impetuous; (originally U.S.), impulsive, assertive, impudent; crude, insensitive; flashy', ***cr****unch* for something broken and rough 'to crush with the teeth (a thing somewhat firm and brittle); to chew or bite with a crushing noise'. At the same time, *crunch* [krʌnʃ] is "a recent variation of *cranch*, *craunch v.*, perhaps intended to express a more subdued and less obtrusive sound, perhaps influenced by association with *crush*, *munch*" (OED), which shows that as the root vowel narrows, the meaning simultaneously is corrected to reduce the size parameter – a trace of iconic modification that once again illustrates the work of iconicity and systematicity mechanisms.

To summarize, in this section, we have seen how phonaesthemes synaesthetically combine meanings of acoustic and other modalities, which demonstrates how they preserve their connection with the mechanisms employed in onomatopoeic and mimetic words. In the next section, I will describe how the semantic structure of the *br-* and *cr-* phonaestheme groups changes diachronically.

2.5 Semantic shifts and broadening of the meanings of phonaesthemes

The process of semantic change within a phonaestheme group can be traced in a study of the *br-* and *cr-*phonaesthemic groups. The conducted study gives evidence that the phonosemantic field structure changes diachronically and that the previous dominant semes (related to sound) become less prominent, and that the entire groups should be studied for a better understanding of the present structures of the *br-* and *cr-* phonosemantic fields.

As it was mentioned in Section 2.4, the modern English *br-*phonaestheme is paired with the following semes: 'broken', 'sharp', 'loud and irritating', 'sudden'. Accordingly, the modern *cr-*phonaestheme is characteristic of denoting 'something broken', often 'accompanied with a sound', 'something rough', 'uneven or scratching', and 'something compressed or twisted'. However, the phonosemantic field structure in both groups changed in the course of time.

2.5.1 Br-words in Old English

The words that used to make up the *br-* group in Old English (OE)and its prevailing semes changed, and new semes emerged. In OE, as my data suggest, the core of the phonosemantic field comprised altogether 13 words united by the idea of exposure to high temperatures, which causes light expulsion and damage. These are the words that can be traced back to: (i) PIE root **b^{h}reu-* 'to boil, burn' (OE ***br**edan* 'breed', ***br**éowan* 'brew', ***br**id*, ***br**ed-*, ***br**yde-* 'bride', ***br**ód* 'brood', ***br**oþ* 'broth'); (ii) PIE root **gw^{h}er-* 'to heat' (OE ***br**and*, ***br**ond* 'brand; fire, flame, burning, also in plural: 'flames') (HARP, OED) and those have a seme "light" (OE ***br**æs* 'brass', ***br**æsen* 'brazen', ***beor**htt-*, ***br**iht (>**br**yht)* 'bright'); (iii) PIE root **b^{h}reg-* 'to break' (OE ***br**yce* 'breach', ***br**æcan*, ***br**ecan* 'break', ***br**ysan* 'bruise', ***br**ed*, ***br**eod* 'bread').

The attested vocabulary of OE also includes five words meaning 'something sharp' or 'quick': OE ***br**émel*, ***br**émbel* 'bramble, rough prickly shrub', OE ***br**óm* 'broom, a shrub', OE ***br**aer*, ***br**er* 'briar/brier, any of various prickly or thorny bushes or shrubs; esp. a bramble or a wild rose', ***br**idel* 'bridle, headpiece of a horse's harness', related to ***br**egdan* 'move quickly', and ***byrst*** '**br**istle, stiff, coarse hair of certain animals' with metathesis of -r- (HARP)). These latter words, I presume, belonged to the field periphery or were nearing the periphery.

2.5.2 Br-words in Middle English

Semantic shifts and statistic growth of the words with semes from the periphery in the Middle English (ME) period resulted in change of the phonosemantic field structure. Altogether, there were 26 *br-* words in the phonaesthemic group in this period:

There are already 12 words meaning "something sharp", coined mostly in the 14–15th centuries or inherited from the OE period: ME ***br**aken* 'bracken, a fern', ***br**ad, **br**od* 'a thin flattish nail', ***br**aoke*, ***br**aake,* 'brake, a toothed instrument for braking flax or hemp', ***br**imbyl*, ***br**embil* 'bramble, rough prickly shrub', ***br**ance, **br**onch* 'branch, a portion or limb of a tree', ***br**eyer*, ***br**eir* 'brier, a prickly, thorny bush or shrub', ***br**ustel, **br**ystylle* 'bristle, stiff, coarse hair of certain animals', ***br**oche*, ***br**otche* 'broach, a pointed instrument used for roasting meat upon', ***br**oche, **br**ooche* 'brooch, an ornamental fastening, consisting of a safety pin', ***br**om, **br**ome, **br**ume* 'broom, a shrub', ***br**oouse*, ***br**use* 'browse, esp. of cattle, deer, or goats: to crop and eat (young shoots, leaves, twigs, etc.) from a shrub or tree', ***br**usshe* 'brush, a utensil consisting of a piece of wood, set with small bunches of bristles, hair', ***br**usch* (wood) 'brush, a thicket of small trees or underwood'.

Additionally, the field periphery in Middle English comprised 6 more words denoting "something loud" (e.g., ***br**age* 'brag, of a trumpet: to sound loudly, to vaunt, talk boastfully', ***br**agart* 'braggart, a vain bragger, one who brags much', ***br**attil* 'brattle, a smart rattling sound, esp. of something breaking or bursting, the sound of scampering feet', ***br**all(e), **br**aul(e)* 'brawl, to quarrel noisily and indecently, to utter clamorously', ***br**eull*, ***br**uill* 'broil, confused disturbance, tumult, or turmoil', ***br**uyt*, ***br**ute* 'bruit, noise, sound; clamour; (obs.) the action of making something publicly known') and 3 more words meaning "something sudden" (***br**eyde* 'braid', ***br**iske, **br**isque* 'brisk, sharp or smart in regard to movement, quick and active', ***br**idil* 'bridle').

Altogether 21 words can be regarded as the periphery of ME phonosemantic field, while 5 words denoting "something broken" (forms of ***br**ake, **br**each, **br**ead, **br**eak, **br**uise*) can be regarded as its core.

One tendency for the growth of the *br*-group from OE to ME was the semantic broadening from denoting the act of breaking to its result in more words and nuances of meaning, cf. ME ***br**eche* 'breach, the physical action of breaking; the fact of being broken; breakage, fracture' (a1400), ***br**eek, **br**ek* 'break, to become fractured, severed, or ruptured as the result of a blow, shock, strain, etc.'. Another shift appeared as a result of broadening of the act of breaking, which implies being sudden and abrupt, to *any* sudden movement. Cf. ***br**eak* 'to sever into distinct parts by *sudden* application of force, to part by violence. Often with an adjunct indicating result, as in to break asunder, in pieces, small' (OED) and E. (obs. after the 17th century) ***br**aid* 'to make a *sudden* jerky movement (originally off or away to one side)', or ***br**ash*$_1$ 'fragile, brittle: used chiefly of timber' (OED). More complex changes can be traced in the word ***br**acken* 'coarse fern' where a further semantic shift can be observed: first the seme "broken" narrows to a more exact "having a sharp edge as a result of breaking" and then widens to the quality of sharpness in general. The word *bracken* was probably borrowed from a Scandinavian source, originating from PG **brak-* 'undergrowth, bushes', from PIE root **b*^{h}*reg-* 'to break' on the notion of 'that which impedes motion' (HARP).

Thus, in the ME period we observe that the ('breaking') subgroup of *br*-words that prevailed in Old English was overnumbered by a subgroup that was formed as a result of semantic development. Therefore, the semes "something sharp", "something loud" and "something sudden" formed a vast periphery space in ME.

2.5.3 Br-words after 1500

Certain words develop new meanings describing sounds, cf. ME *brake* (modern *break*) 'of words, laughter, sounds, etc.: to be spoken or be uttered; to issue, be sounded, or heard from' in "Twixt the perles and rubins [i.e. teeth and lips] softly *brake* a siluer sound." (1590) (OED).

Starting from the 17th century, no cardinal changes within the phonosemantic field can be observed, as the major semes and the statistical correlation between the subgroups remain the same. Single words may also tend to move outside the phonosemantic field as their connection between form and meaning weakens,e.g., *bread* is no more likely to be understood as bread as a whole, not a loaf of bread, broken into pieces, or *bridle* tends to be associated with control, not quickness, thus such words may be pushed outwards as they lose semantic connection.

Therefore, the phonosemantic field of the English *br*-group is modifiable diachronically and undergoes semantic development due to semantic shifts and synthesis.

2.5.4 Cr-words in Old English

The formation of the *cr*-group phonosemantic field can be traced back to the ME period. In the OE period, we may only observe several words demonstrating the connection between lexical meaning and word form, yet without forming a group. Cf. OE ***cr**abba* 'crab' (a crustaceous animal, related to the PIE root **gerb*^{h} 'to scratch, carve'); ***cr**acian* 'crack, to make a sharp noise in the act of breaking'; ***cr**adol* 'cradle' and ***cr**ib* 'crib', both related to the Germanic base meaning 'wickerwork, a basket', which render the tactile feeling of roughness and coarseness. Two more words are OE ***cr**aeft* 'craft, strength, might, power', which used to be the major meaning in OE before it narrowed to 'skill' (OED), and "experience pressure" in OE ***cr**ammian* 'cram, to fill by force or compression'.

Thus, a broad selection of semes in *cr*-words can be observed in OE: something scratchy, coarse, solid or powerful, experiencing power or broken with a cracking sound. Later, in Middle English, these semes grew in number and started forming a phonaestheme group.

2.5.5 Cr-words in Middle English

The set of OE words paired with the parameters of the consonant cluster sounds [k] and [r] (see Section 2.4) provided the foundation for the core of the phonosemantic field of *cr*-words denoting something "broken with a cracking sound", "rough, uneven or scratching" "compressed or twisted" or a hard tough substance.

ME *cr*-group (altogether 38 words) is composed of:

(i) 10 "broken" words (e.g., ***cr**aken* 'crack', ***cr**assche* 'crash', ***cr**uschen* 'crush', ***cr**ouste* 'crust')

(ii) 11 "compressed" words (e.g., ***cr** a cleft, rift, chink, fissure* 'cramp', ***cr**anck(e)* 'crank, a crook, bend, winding, meandering; a winding or crooked path', ***cr**uche(n)* 'crouch');

(iii) 3 "hard" words (***cr**abbe* 'crab', *cragg* 'crag', ***cr**aft*);

(iv) 3 "scratching" words (***cr**ab, **cr**amse* 'to claw, to scratch', ***cr**awle* 'crawl, to move slowly in a prone position, by dragging the body along close to the ground' related to the Old Germanic verb stem **kraƀ-*: 'to scratch');

(v) 4 "harsh" words (e.g., ***cr**adyle* 'cradle').

The seme "fissure" (7 words, i.e. ***cr**annel* 'a small opening or hole; a cranny, crevice', cr*ease* 'the line or mark produced on the surface of anything by folding; a fold, wrinkle', ***cr**evice, **cr**evace* 'a cleft, rift, chink, fissure') appeared as a result of the semantic shift from a process to its result, namely from the process of breaking to the fracture itself, and is placed on the periphery of the field. The process can be illustrated via E. ***cr**ack,* as of the OE period defined in OED as 'to make a sharp noise in the *act of breaking*, or as in breaking; to make a sharp or explosive noise (said of thunder or a cannon (chiefly dialect), a rifle, a whip, etc.)'. Since a1400 it is defined as 'to break without complete separation or displacement of parts, as when a fracture or fissure does not extend quite across', since the 17th as 'to break into fissures; to fissure, cause to split'.

The seme 'fissure' appears in *cr*-words not before the word ***cr**evice* (***cr**evace*) 'a crack producing an opening in the surface or through the thickness of anything solid; a *cleft*, rift, chink, *fissure*' was borrowed in the 14th century from French ***cr**evace*, ***cr**evasse* 'fissure' originating from Latin ***cr**epāre* 'to crack, to fissure' which contained a Latin phonaestheme with a seme 'a crack, a noise' (Malysheva 2024: 150). Thus, words containing a *cr*-phonaestheme are paired with the meaning of something broken with a cracking sound or the characteristic of tactile experience.

2.5.6 Cr-words after 1500

The phonosemantic field of the contemporary English was mostly shaped in the ME period. The major semes remain the same, though some words became obsolete (***cr**ammel*, ***cr**ampand*, ***cr**eechy*) and new ones were coined (***cr**ank*, ***cr**aunch*, ***cr**ee*). More "hard" (***cr**unch*, ***cr**an*) and "harsh" (***cr**ate*, ***cr**eel*) words were coined, while several "scratching" (***cr**amse*) and "fissure" words (***cr**epature*, ***cr**aze*) became obsolete. An additional nuance of slow motion appeared in previously coined ***cr**awl* and ***cr**eep*, though this seme should be regarded as peripheral.

To summarize, in this section we have studied how originally iconic phonaesthemic groups developed diachronically. The modification of meanings and the expansion of these groups by inclusion of non-imitative words with the same onset are the result of the semantic development of the words that make up these groups.

Conclusion

From the discussion in this study, it can be concluded that phonaesthemes are simultaneously instances of iconicity, arbitrariness, and systematicity in the language: Phonaesthemic words employ phonemic features to convey (sound-related) meaning of words forming a core of an expanding phonosemantic field, which is a manifestation of *iconicity*.

Meanwhile the choice of phonemes may differ in different languages. Language-specific restrictions on phonemic combinations are formed regardless of the formation of phonaestheme groups and may confront the requirements of consonant cluster accumulation/formation. Besides, every particular phonosemantic field is original in the way it 'chooses' semantic development mechanisms. All these factors are instances of *arbitrariness*.

Yet, phonaesthemes use previously existing vocabulary, and the newly-coined words take fragments from the already-known words to simplify the motivation and understanding of the newly-coined ones. The same cognitive mechanisms of metonymy and metaphor are used for the semantic development of a phonaestheme as in the language's vocabulary in general. This illustrates the language's *systematicity* in the way of forming and structuring these groups.

Phonaesthemic words share spheres of nomination with non-onomatopoeic and non-mimetic ideophones. This way, it appears that there are different ways chosen by different languages to denote complex (synaesthetic) sensory experiences by means of the imitative system of a language – either by ideophones (a more direct way of rendering sensory experiences) or by phonaesthemes (a less direct way). In this paper, different linguistic instruments used to imitate sounds as well as objects and motions of different sensory modalities of the natural world were discussed. In this context, phonaesthemic sound symbolism appears as a complex mechanism showing features of language iconicity, arbitrariness and systematicity, which makes it a productive tool for (iconic) word coinage.

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