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**ARBEITSGRUPPE 15 | WORKSHOP 15**

Raum | Room: S 16, Seminargebäude

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**Ideophones and lexicalized iconicity in language**

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This workshop takes ideophones as a starting point to investigate lexicalized or conventionalized iconic forms in language from an interdisciplinary perspective. The study of iconic forms within and across languages is crucial because their amount within a language varies greatly; for example, European languages tend to have much fewer ideophones than languages such as Japanese. Per *the iconic treadmill hypothesis* (cf. Flaksmann 2017), languages, however, have a need for iconicity – if European languages are lacking in ideophones, are there other iconic forms and enrichments that may be fulfilling this role instead? Thus far, linguistic research into European languages has often focused on written language, however, many iconic forms occur in the spoken medium, meaning they may have remained obscured from our sight. Furthermore, a renewed focus on different communicative settings could reveal more about the role of iconicity in language. As an example, ideophones are often used performatively, particularly in spoken narratives and in combination with other iconic phenomena, which has been said to enhance listener involvement in these narratives. In addition, the perception of iconicity is also dependent on multiple factors such as language experience and social and cultural conventions and as such, many iconic forms, including ideophones, are not crosslinguistically transparent. Nevertheless, a unified account of iconicity is desirable and in order to achieve this, all aspects of iconic phenomena, including their cognitive, social and cultural basis must be considered. Thus, the key goals of this workshop are threefold: firstly, to raise awareness of and discuss the variety of lexicalized iconicity in spoken language; secondly, to compare the role of lexicalized iconicity crosslinguistically and in different communication settings; and lastly, to facilitate an interdisciplinary exchange on lexicalized iconicity. Potential research topics could include the varying roles of different iconic forms crosslinguistically, the interaction of ideophones and other iconic phenomena, the use and effect of ideophones and iconicity in performances and the language specific nature of iconicity and perceptions of iconicity. We would welcome abstracts not only on ideophones, but also on onomatopoeia, phonesthemes, expressive and iconic morphology as well as phonology, and other, similar iconic phenomena from a range of disciplines, such as formal linguistics, sociolinguistics, language acquisition, psychology, and sign language linguistics.

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## Fighting a Losing Battle: Onomatopoeia vs Sound Changes

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Onomatopoeic words (imitative interjections, imitative content words, and ideophones) are words with iconic correlation between form and meaning, iconicity being a relationship of resemblance. Thus, onomatopoeic words ‘copy’ the natural sounds they denote. Therefore, any changes in form automatically imply changes in meaning. The present talk is devoted to the discussion of the effect of sound changes on onomatopoeic (more broadly – imitative) words.

The research is conducted on 1244 English words which are imitative by origin and were collected through continuous sampling from the third edition of the *Oxford English Dictionary* (OED).

Analysis of their etymologies and historical form changes revealed that 1/3 of the words from the corpus have changed their form. It has also revealed that regular (and sporadic) sound changes affect imitative words in different ways:

- (1) imitative words lose the connection between form and meaning (OE *hlahhan* > PDE *laugh* /lɑ:f/, see also Flaksman 2018);
- (2) imitative words fail to undergo any regular sound changes (*cuckoo*, which retains its form since Middle English, see also Durkin 2009: 127);
- (3) they acquire a new sound-meaning correlation (OE *gebed* ‘a prayer’ > PDE *bead* ‘a small globular body’ with an iconic correlation ‘i : small’, see also Campbell 2013: 224) or restore the lost one (OE *pyffan* > ME *puffe* > PDE *puff* /pʌf/).

The main conclusion of the research is that the overwhelming majority of the studied sound changes were *phonosemantically significant* (1), i.e., affected the imitative words in a negative way.

Cases of *phonosemantic inertia* (2) and *re-iconization / secondary sound symbolism* (3) are, on the other hand, rare (together they constitute less than 1% of the total).

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**The sound of hand: /i/ for finger, /u/ for fist, and /a/ for palm**


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In this study, we present iconic associations between certain phonological features and lexemes related to the human hand. We aim to test the following three hypothesis: a) the [+round] feature is frequent in lexemes for ‘fist’ (round shape); b) the [+low] feature is frequent in lexemes for ‘palm’ (open shape); and c) the [+high, -back] feature is frequent in lexemes for ‘finger’ (spiky shape). We collected and phonetically grouped words for ‘hand’, ‘fist’, ‘finger’ and ‘palm’ from 159 genealogically independent language families. Using binomial tests, we could show that lexemes for ‘fist’ and ‘finger’ do show a high occurrence of [+round] or [+high, -back] segments, but no significant result was found for ‘palm’.

As a follow-up study, we are currently building a cross-linguistic sample of words representing the rock-paper-scissors game or any game using the same handshapes. We see that the words that are not semantically divisible (i. e. words that do not literally represent ‘rock, paper, scissors’ and the like) tend to bear the form of three syllables whose vowels are /i/, /a/, and /o~u/, iconically associated to the number of handshapes as well as the handshapes themselves, thus fitting into our hypothesis. These associations can be easily explained by analogous cross-linguistic and experimental evidence for iconic patterns between rounded vowels, e.g. [u], and round things, between low, open vowels, e.g. [a], and flat things, and between unrounded vowels, e.g. [i], and pointed things (Styles and Gawne 2017; Erben Johansson et al. 2020; Joo 2020). Our findings show that iconicity is encoded in words representing basic handshapes, but also in contexts which include handshapes but are conveyed by non-words or words that derive from completely different etymological sources. This brings further evidence to the notion that iconicity is more prevalent throughout the lexicon than previously thought (Sidhu et al. 2021; Winter and Perlman 2021) and that iconic labels are continuously introduced for iconically congruent meanings, which, in turn, has a notable impact on word formation and the cultural evolution of language.

**References:** • Erben Johansson, Niklas et al. (2020). “The typology of sound symbolism: Defining macro-concepts via their semantic and phonetic features”. In: *Linguistic Typology* 24.2, pp. 253–310. • Joo, Ian (2020). “Phonosemantic biases found in Leipzig-Jakarta lists of 66 languages”. In: *Linguistic Typology* 24.1, pp. 1–12. • Sidhu, David M. et al. (2021). “Sound symbolism shapes the English language: The maluma/takete effect in English nouns”. In: *Psychonomic Bulletin & Review* 28.4, pp. 1390–1398. • Styles, Suzy J. and Lauren Gawne (2017). “When does maluma/takete fail? Two key failures and a meta-analysis suggest that phonology and phonotactics matter”. In: *i-Perception* 8.4, pp. 1–17. • Winter, Bodo and Marcus Perlman (2021). “Size sound symbolism in the English lexicon”. In: *Glossa: a journal of general linguistics* 6.1.2

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## Deriving gender from phonemes: Evidence from Mandarin names using the Random Forest algorithm

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This study examines whether systematic sound patterns reported in English names held in Mandarin Chinese (hereafter: Mandarin). Unlike English, Mandarin names are disyllabic, each represented by a logograph, while strongly associated with a semantic concept. Psycholinguistic studies have suggested that phonology has a lesser role in the naming of Mandarin characters in comparison to Indo-European languages (Zhang et al., 2009); thus, rendering Mandarin a stronger test to the systematic sound patterns previously reported in English.

**Methods:** 212 most common Mandarin given names (115 female & 97 male) from Bao & Cai (2021) was examined. The presence or absence of a phoneme was coded as binary measure. The random forest (Breiman, 2001), a machine learning algorithm, was used to examine systematic sound patterns in Mandarin names. The accuracy of a random forest is determined by feeding its testing subset (two-third data) into the model and observing the error rate which is the percentage of samples that the algorithm was unable to accurately classify. Feature importance was examined to evaluate the contribution of phonemes to classification.

**Results & Conclusion:** The random forest was able to accurately classify 80.28% of the testing subset sample into their allocated gender category, suggesting phonology alone is adequate in predicting gender adaptation (OBB = 19.71%). Details on feature importance could be found in the long abstract. Overall, phonological patterns previously reported have also been found to be predictive of gender identification. Sonorants and high front vowel, with the addition of /ə/, were important to the identification of female names. Obstruents and low back vowels, on the contrary, were predictive of male names. Contrary to van de Weijer et al. (2020), our results suggest that tones do play a role in the identification of gender.

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## Ideophones and iconicity in Korean and Thai

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Korean has a large inventory of ideophones, built on sound symbolism, involving vowel polarity, consonantal tensing and aspiration, and reduplication, the manipulation of which enables lexicalization of diverse sensations, either physical or psychological. Vowel polarity operates on the opposition between the so-called ‘positive’ and ‘negative’ vowels (Rhee & Koo 2017). Consonantal manipulation operates on the tripartite contrasts among plain, tensed, and aspirated phonetic qualities (Koo 2007). Reduplication iconically encodes multiplicity of events. Korean ideophony is widely attested across multiple sensory domains such as vision, audition, gustation, olfaction, etc., strongly pointing to synesthetic perception.

Thai has a modest but smaller inventory of ideophones as compared to Korean, mostly onomatopoeia. Though smaller in size than the Korean system, Thai ideophony also makes use of elegant sound symbolism by vowels (Thongkum 1979), consonants (Rungrojsuwan 2007), and tones (Naksakul 1998), as well as reduplication.

A comparative analysis shows that the two languages have commonalities in ideophone lexicalization strategies, in particular, those tied to the manner of articulation of the sounds involved reflecting the target stimulus’s physical properties such as trailing, decay, amplification, resonance, intensity, among others. When such characteristics coincide, individual ideophones often have similar sounds in their lexicalization. As such these strategies are highly iconic in that lexicalization of sensory perception directly reflects the properties of articulation. Despite the presence of many commonalities, however, the two languages differ in a number of significant ways in detail, many relating to their typological differences and different perceptions of the events being described. Some differences may putatively be due to language-specific idiosyncrasies.

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## On the lexical status of reduplicative ideophones in German

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Ideophones are expressive words that signify sensory imagery through phonological markedness. These words can be thought of as rhetorical devices that, like gestures, enrich the meaning of the message by rendering it more affectively engaging or stimulating or by making the listener imagine the sensory experience or affective involvement of the speaker. Repetition and reduplication are phonologically conspicuous and therefore potent markers for ideophones and for expressives in general. The grammarian has to distinguish different kinds of iteration and carefully delineate morphological reduplication (commonly restricted to doubling) from lexical sequencing (potentially unrestricted). This holds also for reduplicative forms in German, which will be surveyed in this talk. Specifically, I will present a morphological taxonomy of reduplication in German (Kentner 2017) that distinguishes i. (phonotactically illegal) interjections (*hahaha*) and ii. iterative syntagmas (*hopp hopp hopp*, “get a move on”) from iii. reduplicative lexical items (*Mischmasch* “mish mash”). This taxonomy reveals a regularity concerning reduplicative forms in German that has previously gone unnoticed (Kentner 2022): In order to become lexicalized, reduplicative words must not contain exact adjacent repetitions of phonological material (syllables, phonological feet, words). Forms that violate this regularity are – except for a few well-defined exceptions – unlexicalizable nonces (e.g., contrastive focus reduplications like *Kaffee-kaffee*, “standard variety coffee”, see e.g., Horn (2018)). The distinction between a) repetitions with alternation and b) identical repetitions/iterations bears an uncanny resemblance to a distinction made by Bressemer (2021) in the context of research on gesture: Bressemer notes that gesture repetitions with alternation build up complex meaning alongside spoken material, while identical repetitions/iterative gestures pragmatically enforce rather than semantically modify the spoken message. In this talk I will discuss the distinction regarding the semantic or pragmatic import of identical and non-identical repetition along with the distinction concerning the lexical status of reduplicative ideophones in German.

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**Iconicity in Ideophones: Guessing, Memorizing, and Reassessing**

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Iconicity, or the resemblance between form and meaning, is often ascribed a special status and contrasted with default assumptions of arbitrariness in spoken language. But does iconicity in spoken language have a special status when it comes to learnability? A simple way to gauge learnability is to see how well something is retrieved from memory. We can further contrast this with guessability, to see (1) whether the ease of guessing the meanings of ideophones outperforms the rate at which they are remembered; and (2) how willing participants' are to reassess what they were taught in a prior task – a novel contribution of this study (see Figure 1). We replicate prior guessing and memory tasks using ideophones and adjectives from Japanese, Korean, and Igbo. Our results show that although native Cantonese speakers guessed ideophone meanings above chance level, they memorized both ideophones and adjectives with comparable accuracy. However, response time data shows that participants took significantly longer to respond correctly to adjective-meaning pairs – indicating a discrepancy in cognitive effort which favored the recognition of ideophones. In a follow-up reassessment task, participants who were taught foil translations were more likely to choose the true translations for ideophones rather than adjectives. By comparing the findings from our guessing and memory tasks, we conclude that iconicity is more accessible if a task requires participants to actively seek out sound-meaning associations.

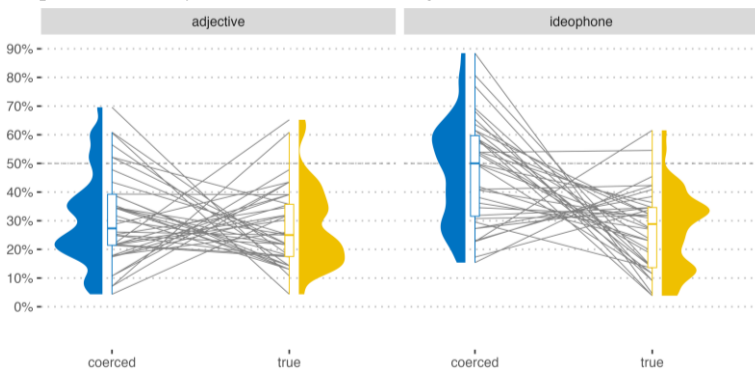


Figure 1. Likelihood to reassess adjectives and ideophones in Igbo.



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## Neuroimaging the Semantics of ideophones in Pastaza Kichwa

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Ideophones are imitative words featuring linguistic sounds, bodily gestures, intonation, and facial expressions to depict sensory perceptions, emotions, and temporal experiences of completeness, instantaneousness, and repetitiveness. Although formal properties of ideophones have been given ample attention, there are fewer studies of their lexical semantics. The research for this paper hypothesized that correlations exist between posited semantic features of ideophones from the Pastaza Kichwa language spoken in eastern Amazonian Ecuador (iso code: qvo), and subjects' neural reactions to auditory clips of ideophones bearing these posited semantic features.

Participants (N=17) were presented with audio clips of 10 ordinary Kichwa words consisting of nouns and verbs. They were then asked to listen to Kichwa ideophones from four different categories based on a sensori-semantic map (Nuckolls 2019). Data was collected on site in the Amazonian region of Ecuador. While participants listened to clips of these ideophones extracted from their sentential contexts, their hemodynamic brain responses were recorded using functional near-infrared spectroscopy (fNIRS). The examples from which the extracts were drawn are found in an open access archive, Quechua Real Words.

Preliminary analyses of the results suggest support for the four sensorisemantic categories of ideophones. There were also similarities across all four categories relative to the baseline. Each ideophone category appears to have prompted distinctive neural activity in somatosensory and motor regions of the brain. Similarly, ideophones generally differed from baseline by prompting greater neural activity in areas of the frontal cortex associated with cognition, thought and visual imagery.

Our results also contribute to research that has not typically involved subjects other than 'western-educated-industrialized' peoples, nor has been conducted as a collaboration between neurolinguists and anthropological linguistic work featuring long-term, intensive studies of ideophones' semantic properties.

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## Ideophones in the visual modality

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Sign languages, like spoken languages, use a variety of more or less iconic conventionalized lexical signs to describe entities, events or properties among others (Perniss et al. 2010). Besides, sign languages also systematically use gestural demonstrations (in combination with lexical signs) to depict events or actions (Davidson 2015). A third class of items used in addition to lexical signs and gestural demonstrations are so-called complex multi-channel signs (MCSs), a special part of speech that has not yet received much attention in linguistic research (Brennan 1992, Johnston & Ferrara 2012, Schütte 2014).

MCSs, which are sometimes also called ‘Spezialgebärden’ (special signs), ‘Gebärdenwendungen’ or ‘(sign language) idioms’, form a relatively small class of conventionalized expressions, which have special formal properties different from lexical signs and gestural demonstrations. On the functional side, the meaning of MCSs is highly context dependent and often translated into spoken languages with the help of different complex idiomatic expressions.

Based on examples taken from the Hamburg DGS corpus (<https://www.sign-lang.uni-hamburg.de/dgs-korpus/index.html>), we discuss modality-independent and modality-dependent properties of MCSs and argue that both their flexible ‘idiomatic’ meaning and their special formal properties show certain similarities with ideophones in spoken languages (Dingemanse 2019).

One result of this cross-modal comparison is that sign languages just like many spoken languages have a special class of marked lexical expressions that depict sensory imagery. Unlike ideophones in spoken languages, the depiction of MCSs in sign languages is not auditory but visual. And unlike other iconic lexical expressions in sign languages, MCSs are ‘idiomatic’ depictive context-dependent expressions with an expressive meaning component.

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## The Distribution of Iconic Co-speech Gestures, Information Structure and Prosody: A Corpus Study on Prominence Peak Alignment

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In this talk, we explore the impact of different degrees of prominence on the prosody-gesture alignment of iconic and non-referential gestures in spontaneous German speech. Iconic gestures show a semantic connection to speech, non-referential gestures support speech structurally. Both have been found to align with prosodic features (McNeill 1992, Im & Baumann 2020, Loehr 2012). Given that prosodic prominence varies as a function of information structure (IS, Baumann & Röhr 2015, Kügler & Calhoun 2020), we address the research question whether the alignment of prosody and gestures is sensitive to IS in German spontaneous speech.

Conducting a corpus analysis using the SaGA corpus (Lücking et al. 2010), we analysed 204 min of spontaneous speech dialogues. Gesture types were already annotated in the corpus; the annotation of gesture peaks, intonation, and IS (focus, givenness) was performed for this analysis. The occurrence of gestures in relation to pitch accents and IS categories was extracted. Out of 1.630 iconic and 775 non-referential gestures in the corpus, 53% of the iconic gestures and 39,5% of the non-referential gestures occurred on referents coded for IS. All gestures more frequently aligned with more prominent information status referents than less prominent referents. Regarding focus, iconic gestures occurred predominantly on unfocused constituents, while non-referential gestures rather occurred on focused referents. A negative correlation between co-speech gestures and pitch accents was found. The correlation of intonation and IS is influenced by both gesture types, such that their prominence correlation is more precise when a gesture is present.

While a general prosody-gesture link is assumed, the observation of iconic gestures occurring on more prominent information status but not focus referents calls for a distinct identification of the semantic and discourse functions of iconic gestures.

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## The influence of vocal iconicity on word structure through stress and segment placement

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Cues used for improving language processing – such as iconicity aiding access to meanings – seem to benefit from being emphasized within words. Stressed segments lead to a more precise phonetic realization and spoken word recognition models indicate that when the onset of a word is heard, a set of words in the mental lexicon with the same initial segments compete for activation (Norris & McQueen 2008). This study investigates if stress and segment placement within words have a positive effect on vocal iconicity. In Study 1, 300 participants were recruited from 11 language families. 12 cross-linguistic sound-meaning associations (Blasi et al. 2016; Erben Johansson et al., 2020; Joo, 2020) and 3 non-iconic (control) sound-meaning combinations were selected. Each sound-meaning association was represented by four word types with varied stress and segment placement, recorded audially. The participants were asked to listen to each stimuli word and then rank it according to how well it fit the associated meaning. The results showed higher rankings for iconic words than control words, and that stress had a significant effect. Interestingly, the control words showed a negative effect for segment position, indicating a hidden positive segment position effect for iconic words. In Study 2, the segment position effect was tested cross-linguistically. 125 noteworthy sound-meaning associations and 16 control concepts with low iconicity scores were selected. The average first segment position occurrences for each iconically charged sound group per iconic concept were then compared to the average first segment position occurrences for the same sound group yielded from the control concepts. The results showed that sound groups occurred more towards the beginning of congruent iconic concepts in almost all sound-meaning associations. This shows that stress and segment position affect how iconic words are perceived to be. Stress can prevent phonetic erosion which can, in combination with pre-activation effects, cause iconic segments to be retained to a greater extent and then progressively moved towards the onset of words. Thus, these factors could distinctly affect word formation and sound organization across lexica.

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## Spoken rhythms and drummed speech: Bidirectional iconicity at the crossroads of language and music

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Language and music share many of the same raw ingredients, including pitch, rhythm, prosodic grouping, and timbre. This talk focuses on an underexplored aspect of the language-music connection: the iconic representation of one modality using the other, through onomatopoeia (music encoded as speech) and musical surrogate languages (speech encoded as music). In particular, I focus on drums to probe the bidirectional nature of this iconicity, what differences exist in the two directions of encoding, and what this tells us about the language and music faculties. All languages are capable of encoding percussive sounds through onomatopoeia, but certain linguistic and musical traditions possess an extensive vocabulary of lexicalized onomatopoeia, the most notable example being the system of *bols* in the North Indian tabla drumming tradition (Patel & Iversen 2003). Aspects of Hindi phonetics in the choice of syllables produce a close acoustic match to the sounds of the drums, while the pitch and rhythm of the performer's voice allows for a fairly faithful reproduction of the drum patterns.

Musical surrogate systems, referred to colloquially as “talking drums”, turn this iconicity on its head by using the sounds of drums to capture speech. However, we find an interesting difference in the linguistic categories involved in this bidirectional mapping: onomatopoeia rely most heavily on linguistic timbre (i.e. segmental contrasts), whereas drummed speech is typically based on prosodic features (tone, rhythm). This is unsurprising for drums whose timbre remains relatively fixed while the pitch varies, such as tension drums or slit log drums. More surprising are drums capable of producing a wide range of timbres, yet whose use as a surrogate continues to rely more heavily on prosody rather than linguistic timbre, such as the Yorùbá *bàtá* (Villepastour 2016).

In this talk, I illustrate these complex systems of spoken drums and drummed speech and argue that differences in encoding medium (timbre, pitch, rhythm) arise from two related sources: 1. Linguistic timbre has far greater complexity and dexterity than drum timbre, and 2. language is grounded in timbral contrasts, while timbre-centered music is rare. Thus, musical surrogate languages are still fundamentally music, and emulating prosodic aspects of speech constrains the number of contrasts the drums must reproduce, which may enhance its perceived iconicity as well as decipherability.

**References:** • Patel A. and J. Iversen (2003). Acoustic and perceptual comparison of speech and drum sounds in the North Indian tabla tradition. *ICPhS* 15, 925-928. • Villepastour, A. (2016). *Ancient text messages of the Yorùbá bàtá drum*. New York: Routledge.