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A data-driven study of auditory iconicity

Andrea Gregor de Varda & Marco Marelli

A form of non-arbitrariness in language is iconicity, i.e. a consistent relationship between linguistic sounds and their referents that is defined not only by convention, but also by the sounds' and the objects' intrinsic qualities. While various research efforts have investigated vision-related linguistic iconicity (see for instance Kohler, 1929, 1947; Maurer et al., 2006; Ramachandran & Hubbard, 2001; Sapir, 1929), less attention has been paid to the other sensory modalities (although see Fontana, 2013; Gallace et al., 2011; Joo, 2020; Speed et al., 2021). This vision-centric approach is to some extent motivated by the perceptual predominance of the visual modality in humans (Lynott et al., 2020). However, some properties of auditory iconicity make it an interesting testbed for the study of non-abritrariness. In contrast with the other senses, auditory iconicity in oral languages takes place *within* a perceptual modality. Additionally, words with high auditory perceptual strength are considered the most iconic, as documented by both explicit iconicity ratings (Winter et al., 2017) and guessing studies (Dingemanse et al., 2016). Another piece of evidence for the peculiar status of auditory iconic words comes from linguistic typology, where it has been shown that auditory terms constitute the most prominent class of perceptual terms in the ideophonic lexicon across languages (McLean, 2021).

Given the increasing recognition of the role played by auditory iconicity in vocabulary structure, it is crucial to develop a valid measurement for the construct under invetigation. It is common practice to operationalize iconicity through subjective ratings; however, iconicity ratings have been criticized for having low construct validity. Thompson et al. (2020) have suggested that the participants' responses in rating studies might be based on semantics alone – and in particular on perceptual strength –, which would call for a different, and possibly objective measure of phonosemantic transparency. Additionally, ability of language users to assess whether a sound is iconic has been questioned, as it has been shown that native speakers have a positive bias when judging whether sounds fit their reference in their native language (Sutherland & Cimpian, 2015). Winter & Perlman (2021) provided a response to those criticisms, and rightfully noted that iconicity ratings have served an important purpose in explaining the distribution of iconic properties in the lexicon; however, they recognize that iconicity ratings should be complemented by other tools in order to grant a more comprehensive picture on the role of iconicity in language. In this presentation, we propose a data-driven alternative to iconicity ratings, where we operationalize auditory iconicity as the objective similarity between (i) the sound of a word and (ii) the natural sounds associated with its referent. Both spoken words and natural sounds are embedded in a shared vector format in one of three ways:

- Short-time Fourier transform (STFT), a mathematical procedure that transposes sound waves into individual frequencies and their amplitudes;
- Sound classification network, a neural network trained to label sounds;
- Speech recognition network, a neural network trained to recognize spoken words.

For all these three methods, the obtained sound representations embed natural sounds and word sounds into a shared vector space. This allows to estimate the objective similarity between word sounds and natural sounds, which we employ as a measure of auditory iconicity. We use these metrics to assess the pervasiveness of iconicity in the English auditory lexicon, and empirically validate them in explaining human intuitions, against a strong baseline of psycholinguistic variables associated with the construct under scrutiny. Our results show that word sounds are significantly more similar to

the natural sounds of their referents than to other unrelated natural sounds, demonstrating that imitation can be considered as a widespread mechanism underlying the structure of the English auditory vocabulary. Auditory mimicry thus plays a significant role in the phonological structure of the lexicon, and is not limited to onomatopoetic words. Furthermore, our computational measures are predictive of human judgements on form-meaning resemblance. This result challenges the criticism put forward by Thompson et al. (2020), who proposed that iconicity ratings only reflect subjective intuitions on perceptual strength: our data-driven measurements are significant predictors of human ratings in four out of six conditions even when perceptual strength is included as a covariate in the model. At the same time, our study demonstrates that data-driven alternatives to human judgments do exist, and can be employed to study subtle and elusive phenomena such as iconicity.

References

Dingemanse, M., Schuerman, W., Reinisch, E., Tufvesson, S., & Mitterer, H. (2016). What sound symbolism can and cannot do: Testing the iconicity of ideophones from five languages. *Language, 92*(2)

Fontana, F. (2013). Association of haptic trajectories to takete and maluma. In *International workshop on haptic and audio interaction design* (pp. 60–68).

Gallace, A., Boschin, E., & Spence, C. (2011). On the taste of "bouba" and "kiki": An exploration of word–food associations in neurologically normal participants. *Cognitive neuroscience, 2*, 34-46.

Joo, I. (2020). Phonosemantic biases found in leipzig-jakarta lists of 66 languages. *Linguistic Typology, 24*, 1-12

Kohler, W. (1929). Gestalt psychology. liveright. Oxford, England.

Kohler, W. (1947). Gestalt psychology: An introduction to new concepts in modern psychology.

Lynott, D., Connell, L., Brysbaert, M., Brand, J., & Carney, J. (2020). The lancaster sensorimotor norms: multidimensional measures of perceptual and action strength for 40,000 english words. *Behavior Research Methods, 52*(3), 1271–1291.

McLean, B. (2021). Revising an implicational hierarchy for the meanings of ideophones, with special reference to japonic. *Linguistic Typology, 25*(3), 507–549.

Ramachandran, V. S., & Hubbard, E. M. (2001). Synaesthesia–a window into perception, thought and language. *Journal of Consciousness Studies, 8*(12), 3–34.

Sapir, E. (1929). A study in phonetic symbolism. *Journal of experimental psychology, 12*(3), 225.

Speed, L. J., Atkinson, H., Wnuk, E., & Majid, A. (2021). The sound of smell: Associating odor valence with disgust sounds. *Cognitive Science, 45*(5).

Sutherland, S. L., & Cimpian, A. (2015). An explanatory heuristic gives rise to the belief that words are well suited for their referents. *Cognition, 143*, 228–240.

Thompson, A. L., Akita, K., & Do, Y. (2020). Iconicity ratings across the japanese lexicon: A comparative study with english. *Linguistics Vanguard, 6*(1)

Winter, B., & Perlman, M. (2021). Iconicity ratings really do measure iconicity, and they open a new window onto the nature of language. *Linguistics Vanguard, 7*(1).

Winter, B., Perlman, M., Perry, L. K., & Lupyan, G. (2017). Which words are most iconic?: Iconicity in english sensory words. *Interaction Studies, 18*(3), 443–464.

Niklas Erben Johansson

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

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 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 (e.g. Marslen-Wilson, 1980). For example, *jealous* /dʒɛləs/ shares initial sounds with more words compared to *zealous* /zɛləs/ and is therefore more difficult to recognize quickly. Consequently, this study investigates if stress and segment placement within words have a positive effect on vocal iconicity. 300 participants were recruited from 11 language families. 12 sound-meaning associations that were found in at least two major large-scale cross-linguistic studies (e.g. Erben Johansson et al., 2020; Joo, 2020), along with three 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 significantly 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, which could indicate a hidden positive segment position effect for iconic words too. To further investigate this, cross-linguistic iconic data was re-analyzed to see if sounds occur more towards the beginning of words when iconically charged compared to when they are found in non-iconic words. 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. These findings show that segment prominence has a significant effect on how iconic words are perceived to be. While stress might have a stronger effect than segment position, it is likely that these factors work in tandem. Stress tends to prevent phonetic erosion, and over time, this could, in combination with preactivation 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.

References

Erben Johansson, N., Anikin, A., Carling, G., & Holmer, A. (2020). The typology of sound symbolism: Defining macro-concepts via their semantic and phonetic features. *Linguistic Typology*, *24*(2), 253–310. https://doi.org/10.1515/lingty-2020-2034

Joo, I. (2020). Phonosemantic biases found in Leipzig-Jakarta lists of 66 languages. *Linguistic Typology*, *24*(1), 1–12. https://doi.org/10.1515/lingty-2019-0030

Marslen-Wilson, W. D., & Tyler, L. K. (1980). The temporal structure of spoken language understanding. *Cognition, 8*(1), 1-71.

EIGHT HURDLES TO OVERCOME BY ICONIC COINAGE

Maria Flaksman
Ludwig Maximilian University of Munich
Mariia.Flaksman@anglistik.uni-muenchen.de

Imitative words (here: an umbrella term for ideopohones, onomatopoeic and mimetic words) are words with iconic correlation between form and meaning (Peirce, 1940). Iconic coinage is known worldwide – in modern (see, e.g., Voeltz et. al., 2001), ancient, and reconstructed languages (an overview – see Flaksman, 2015), as well as in invented languages (Davydova, 2022). However, imitative words are not identical even in closely related languages despite the fact that they do share a considerable degree of cross-linguistic similarity. The ***aim*** of this talk is to define and classify the reasons why imitative words differ from each other worldwide. The examples are drawn from the ***material*** of the *Iconicity Atlas* (IA) and *The Oxford English Dictionary* (OED).

I distinguish three main types of restrictions on iconic imitation: biological, systemic, and chance restrictions. The first type of restrictions is objective (predetermined by human physiology) and, therefore, does not add to the dissimilarity of imitative words. The other two, however, arbitrary and should be described in detail.

Biological restrictions

We can only imitate what we can hear (hurdle 1) and pronounce (hurdle 2). The biology of our speech organs does not allow us to produce an ideal imitation of a cat's miaow, for example. So, these two a rather 'technical' hurdles. The restrictions discussed below are, on the other hand, of cognitive nature, and, therefore, more complicated.

Systemic restrictions

Systemic restrictions are restrictions predetermined by the parameters of the language system where imitative words are coined. Language is an arbitrary system of signs, which implies that new, language-specific, hurdles arise if one intends to coin an imitative word.

Firstly, languages differ by their phonemic inventories (hurdle 3). Thus, such words as English *thump* or *thwack* are not possible to coin in Russian which has no /θ/ in its phonemic inventory.

Secondly, imitative words should comply with phonotactic rules of the language (hurdle 4). Thus, words like *scream*, *plump* or *mwah* cannot be coined in languages with prohibited initial or final consonant clusters.

Ideophones and certain ideophonic interjections tend to overcome these two hurdles with relative success (see, e.g., Voeltz et. al., 2001), however, these 'marked' traits tend to disappear in the course of system integration (Dingemanse, 2017; Dingemanse & Akita 2017).

Further grammatical integration (esp. creating content words out of ideophones/imitative interjections – see McGregor, 2001) in many languages creates an additional hurdle (5) – addition of (arbitrary) morphological markers (including root changes by ablaut).

Also, the longer the word exists in the language the more likely it is to be affected by language change, which affects iconicity negatively (Flaksman 2017; 2018).

Chance restrictions

Chance restrictions are restrictions which are neither explained by human biology or by linguistic factors. These include (hurdle 6) picking up the salient characteristics of the nominated sound (articulatory gesture), (hurdle 7) choosing between typologically similar phonemes from the phonemic inventory the language, and (hurdle 8) arranging them into sequences (within the boundaries of phonotactic restrictions).

The chance restrictions were summed up by Voronin (2006: 185) in a form of *multiple-nomination law*. It states that "one and the same concept may have different (iconic) motifs of nomination and vice versa – one and the same motif of nomination may be encountered in several concepts". Thus, a dog's bark in different languages is conveyed via onomatopoeic words with different *nomination motifs*: cf. English *bark*, Swedish *skälla*, Norwegian *gjø* German *bellen*, etc. (Shamina 2017: 325). The same nomination motif (e.g., a high-pitched sound) trigger the coinage of very dissimilar onomatopoeic words (e.g., *peep, beep, chirp*).

The talk will be devoted to the detailed discussion of these restrictions on imitative coinage which make imitative words so different in different languages. The similarities between imitative words which arise due to iconicity will be discussed as well.

References

Davydova, Varvara. 2022. *Zvukoizobrazitel'naja leksika v vymyšlennyh jazykah: fonosemanticeskij analiz* [Imitative words in invented languages: phonosemantic analysis]. St. Petersburg: St. Petersburg University of Economy (Doctoral dissertation).

Dingemanse, Mark & Akita, Kimi. 2017. An inverse relation between expressiveness and grammatical integration: on the morphosyntactic typology of ideophones, with special reference to Japanese. *Journal of Linguistics*, 53(3). 501–532.

Dingemanse, Mark. 2017. Expressiveness and system integration: On the typology of ideophones, with special reference to Siwu. In *STUF*. *Language Typology and Universals* 70(2). 363–384.

Flaksman, Maria. 2015. *Diahroničeskoe razvitie zvukoizobrazitel'noj leksiki anglijskogo jazyka* [Diachronic development of English imitative vocabulary]. St. Petersburg: University of St. Petersburg (Doctoral dissertation).

Flaksman, Maria. 2017. Iconic treadmill hypothesis: the reasons behind continuous onomatopoeic coinage. In M. Bauer, Angelika Zirker, Olga Fischer, and Christine Ljungberg (eds.) *Dimensions of Iconicity* [Iconicity in Language and Literature 15]. 15–38. Amsterdam: John Benjamins.

Flaksman, Maria. 2018. Onomatopoeia and regular sound changes. *Siberian Federal University Journal: Humanities & Social Sciences*. 1–11.

IA – *Iconicity Atlas Project: a multilingual online dictionary of iconic words and ideophones*. 2022. (http://www.iconicity-atlas.com/index.htm) (Accessed 2022-09-10.)

McGregor, William. 2001. Ideophones as the source of verbs in Nothern Australian languages. In F. K. E. Voeltz & Ch. Kilian-Hatz (eds.), *Ideophones. Typological Studies in Language 44*, 205–222). Amsterdam: Benjamins.

OED — *The Oxford English Dictionary* (3d edition). (http://www.oed.com) (Accessed 2022-09-09).

Peirce, Charles Sanders. 1940. *The philosophy of Peirce: selected writings* (ed. by J. Buchler). New York: Harcourt, Brace and Company.

Shamina, Elena. 2017. Reprezentacija laja v jazyke: svidetel′stvo v pol′zu suŝestvovanija zvukopodražatel′noj kartiny mira [Language representation of dog barking: An argument for the onomatopoeic world mapping]. In *Aktual'nye problemy jazykoznanija*, 324–327. St. Petersburg: LETI University Publishing.

Voeltz, Erhard F. K. & Kilian-Hatz. Christa (Eds.). 2001. *Ideophones [Typological Studies in Language 44*]. Amsterdam-Philadelphia: John Benjamins.

Voronin, Stanislav. 2006 [1982]. *Osnovy fonosemantiki* [The fundamentals of phonosemantics]. Moscow: Lenand.

Klingon sounds evil, Quenya sounds pleasant? Perception of constructed languages among Cantonese, English, Japanese, and Mandarin Chinese native speakers.

Authors: Henrik Hornecker, Christine Mooshammer, Olga Olina, Qiang Xia.

Several studies have shown that human beings associate sounds found in natural languages with sensory experiences, such as brightness, colours, speed, or taste (Lockwood & Dingemanse, 2015), suggesting that the linguistic sign is in fact not entirely arbitrary (de Saussure, 1916). The association between shapes and speech sounds seem to be stable crosslinguistically regardless of cultural background or writing systems (Lockwood & Dingemanse, 2015; Ćwiek et al., 2022), and related to such factors as the vowel height and roundness, the consonant voicing, the vowel to consonant ratio and the frequency of open syllables.

The current experimental study has a twofold aim. Firstly, we investigate whether participants with different L1 (Cantonese, English, Japanese and Mandarin Chinese) rate constructed languages differently on various scales and whether divergences in rating results can be explained through phonological features of the participants' L1. We take into account features such as sonority, based on the sonority index (Fought et al., 2004), the syllable structure, vowel to consonant ratio and the occurrences of certain phonemes, for instance, back vowels (Bloomfield, 1909). Differences in rating results would suggest that the perception of the language aesthetics depends on the linguistic background, in this case, the native tongue.

Secondly, Reiterer et al. (2020) found that familiarity with a language results in its more positive assessment. In our experiment, we reduce the factor of familiarity with a language by using constructed languages, which are less known to the public. Therefore, we are able to concentrate on the effect of the phonological and phonetic resemblances. We assume that the more similar the phonological system of a constructed language is to the participants' native tongue, the more positively that language will be assessed.

For our experiment, we chose three sentences in each of the following 14 constructed languages: Adûnaic, Atlantean, Dothraki, Fjerdan, Horn, Kesh, Khuzdul, Klingon, Na'vi, Orkish, Quenya, Sindarin, Vulcan, and ʔUiʔuid. Each of the sentences was recorded by a female and a male speaker spoken in a neutral voice without any emotional involvement. The participants were asked to rate the randomized stimuli on three 7-point Likert scales: good – evil, pleasant – unpleasant, peaceful – aggressive. The experiment was hosted on the browser-based Percy platform (Draxler, 2011).

In total, 158 participants (25 Cantonese, 37 English, 36 Japanese, 63 Mandarin Chinese) completed the online experiment. The ratings given by the four groups of participants demonstrate several differences suggesting that the perception of constructed languages depends on the L1 knowledge. While the English and Japanese speakers found the sound of Quenya most pleasant, Kesh received the most positive ratings from the speakers of Cantonese and Mandarin Chinese. Interestingly, Klingon was rated most negatively by all four groups of participants. To explain the differences in ratings we evaluate the correlations between the rating results and various phonological/phonetic features of the investigated constructed languages and participants' L1. Although the results are not always clearly interpretable, it can be generally stated that it is easier to discern what is considered to sound unpleasant than euphonious.

References

Bloomfield, Leonard. (1909). *A semasiological differentiation in Germanic secondary ablaut*. Chicago: The University of Chicago.

Ćwiek, Aleksandra et al. (2022). The *bouba/kiki* effect is robust across cultures and writing systems. *Philosophical Transactions of the Royal Society B*, 377 (1841). 20200390.

Draxler, Christoph. (2011). Percy-an HTML5 framework for media rich web experiments on mobile devices. *Twelfth Annual Conference of the International Speech Communication Association*.

Fought, John G. et al. (2004). Sonority and climate in a world sample of languages: Findings and prospects. *Cross-Cultural Research*, 38 (1): 27–51.

Lockwood, Gwilym; Dingemanse, Mark. (2015). Iconicity in the lab: A review of behavioral, developmental, and neuroimaging research into sound-symbolism. *Frontiers in Psychology*, 6: 1–14.

Reiterer, Susanne M. et al. (2020). Foreign language learning motivation: Phonetic chill or Latin lover effect? Does sound structure or social stereotyping drive FLL? *Psychology of Learning and Motivation*, 72: 165–205.

de Saussure, Ferdinand. (1916). *Cours de linguistique générale*. Cambridge: Payot.

From iconic pictures to "grammatical" templates: Modeling the evolution of internet memes

Ana Krajinović[1] and Xavier Rodrigues[2]

[1]Heinrich Heine University Düsseldorf
[2]University of Bochum

Language is known for incorporating both iconicity and arbitrariness in its lexicon (Dingemanse et al., 2015), which obeys grammar, a system of higher abstraction. While language evolution provides insight into how humans create abstract systems out of and with iconicity (Monaghan & Roberts, 2021), multimodal constructions such as internet memes can provide a wealth of data on this evolution pattern.

In this paper, we argue that many image macros or internet memes change over time by going from an iconic picture or scene to an arbitrary association of image and text, and finally to their own "grammatical" template, in a process akin to grammaticalization, while at the same time maintaining a certain level of iconicity and semantic relatedness to the source material.

We analyze ten different exploitable memes (ca. 2000 instances), each consisting of an image macro with text. We collect information on the date, format and semantic change over time of a sample of meme instances shared on Know Your Meme (knowyourmeme.com). Our classification of semantic change describes the incremental stages of change of text and picture in memes (see Figure 1). These stages are parallel to the stages of grammaticalization, such as use in new contexts (innovation), semantic bleaching and erosion (change of text and picture), and decategorialization (emergence of a new meme). We also show that these stages follow the same temporal ordering across memes (cf. Figure 1), resembeling the unidirectionality of grammaticalization.

We show that the change and replacement of text and picture lead to a higher degree of arbitrariness of form and meaning of the meme in relation to its original iconic meaning. We also show that, statistically, wider transmission leads to a higher rate of semantic change in the direction of higher abstraction (see Figure 2).

References

Dingemanse, Mark, Damián E Blasi, Gary Lupyan, Morten H Christiansen & Padraic Monaghan. 2015. Arbitrariness, iconicity, and systematicity in language. *Trends in cognitive sciences* 19(10). 603–615.

Monaghan, Padraic & Seán G Roberts. 2021. Iconicity and diachronic language change. *Cognitive Science* 45(4). e12968. doi:https://doi.org/10.1111/cogs.12968.

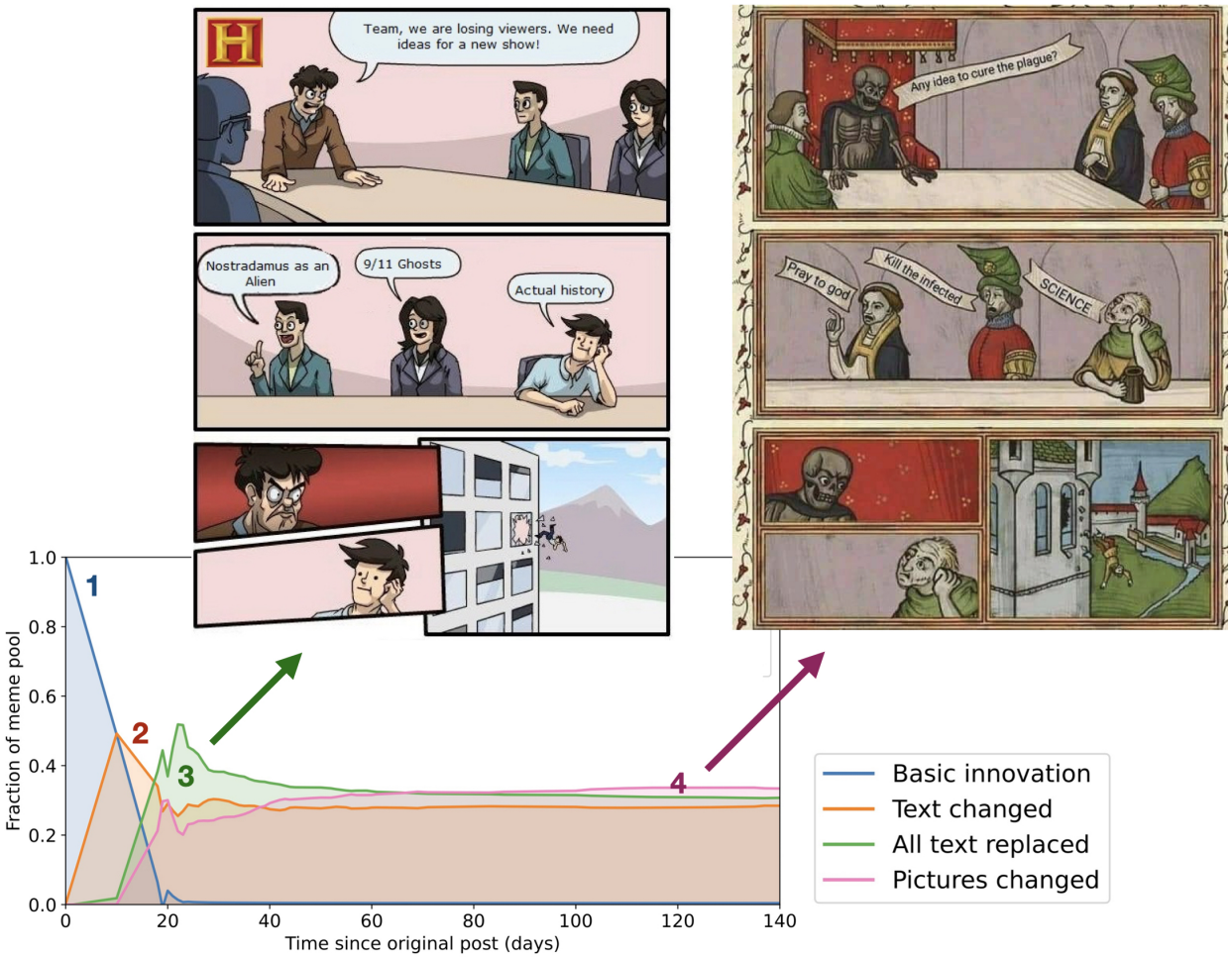

Figure 1: Fraction of memes (N=277) in each stage of evolution over time of the "Boardroom suggestion" meme with examples

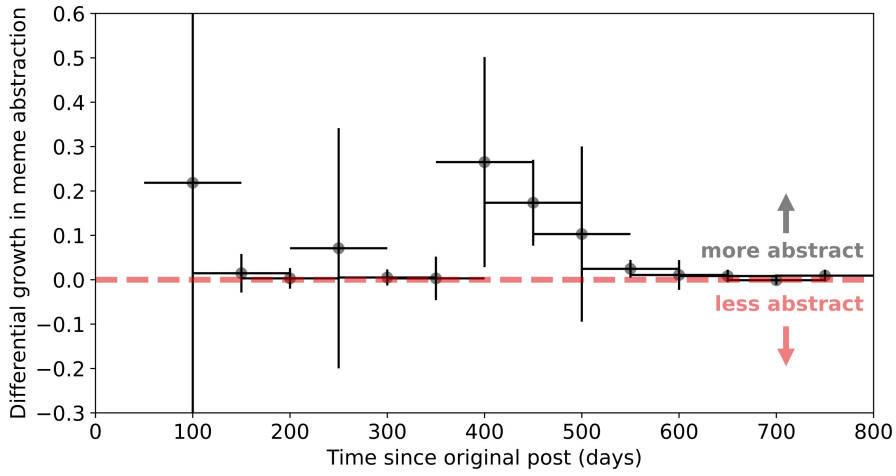

Figure 2: The rate of change of the average level of abstraction over time in our meme pool

Valeria Malysheva
Saint Petersburg Electrotechnical University "LETI"
Teaching fellow, graduate student

English phonaesthemes: phonosemantic fields of the *br-* and *cr-* groups

Iconicity in language may be regarded within the frames of the phenomenon of sound symbolism. *Phonaesthemes* are two or three phonemes in a contact position (e.g., *br-*, *gl-*) demonstrating a recurring association with semantically related meanings. The term was first introduced by Firth (1935). Since then, it has received an instrument of credible study (Voronin, 2006), and a number of researches appeared describing different languages (Sadowski, 2001; Smith, 2016; Kwon & Round, 2015; Abelin, 2015; Joo & Liu, 2020; Willemsen & Miltersen, 2020). The issues of the status and the origin of phonaestheme remain contradictory. The notion *phonosemantic field* (Mikhalev, 1995) appears to be an effective instrument for the phonaesthemic group studying. The present research arises the problem of the origin of phonaesthemic sound symbolism in English and the semantic development of the phonaesthemic groups.

For the moment, the phonaesthemic groups *br-* and *cr-* are being analysed. The research ***material*** is gathered by the method of continuous sampling from the Oxford English Dictionary (3 ed.). Altogether, around 300 words are analysed. Historical-comparative ***method*** is applied together with phonosemantic analysis and other methods of etymology. The study ***aims*** to trace the semantic change of the words, to identify the phonosemantic fields of the phonaesthemes in question.

It occurs that there is a connection between the core of the phonosemantic field with the ancient roots of the words that used to form a major part of the group of words with the same onset. For instance, *br-* group is much influenced by PIE roots **bhreg-* 'to break' and **bhreu-* 'to boil, bubble, effervesce, burn'. Still, a further semantic development and the semantic shift to the consequences of breaking (sharpness, the sound of breaking) resulted in a greater number of the words with the semes *'something sharp and thorny, loud and irritating, sudden'* (Flaksman, 2016). The seme *'something broken'* though presumably remains in the semantic core, while the other semes remain on the periphery.

The *cr-* phonaesthemic group is characterised as *'something rigid, inflexible and rough'* (Flaksman, 2016). In the meantime, a significant number of the words analysed have a seme *'broken'*, *'broken with a crackling noise'*, *'twisted by force'*, *'forceful'* or *'a fissure'*. The word *craft*, which is registered since the OE period, might be particularly important to understand the development of the group. OED states that it was used in its original sense *'strength, might, power'*, traced in other Germanic languages, until the 16th century (OED). The examples of its use in the contemporary language demonstrate the shift to meanings of *'skill, ability, and related senses'* making it the interconnections within this group hardly visible.

Among the ***conclusions*** we reached were the following:

- the phonosemantic field is influenced by the etymology of the oldest words as well as the growing number of words with a semantic shift;

- the semantic development of the group may cause the attraction of the words that are not etymologically connected with the core of the phonosemantic field to the satellite positions;
- initial reason for forming a phonaestheme group may become obscure once the words of the core of the phonosemantic field change their major meaning greatly.

The research focuses on the present and other conclusions about nature and history of phonaesthemes of the English language.

References

Abelin, Å. (2015). Phonaesthemes and sound symbolism in Swedish brand names. Ampersand, 2, 19–29. https://doi.org/10.1016/j.amper.2014.12.001

Firth, J. R. (1935). The Technique of Semantics. Transactions of the Philological Society, 34, 36–72. https://doi.org/10.1111/j.1467-968X.1935.tb01254.x

Flaksman, M. A. (2016) A Dictionary of English Iconic Words on Historical Principles. St. Petersburg: Institute of Foreign Languages/RHGA Publishing Company.

Joo. I., Liu, M. (2020). Profiling Sound Symbolism: The case of Mandarin phonestheme -ang. Paper presented at 21st Chinese Lexical Semantics Workshop (CLSW2020), Hong Kong, China.

Kwon, N. & Round, E. R. (2015). Phonaesthemes in morphological theory. Morphology 25, 1–27. https://doi.org/10.1007/s11525-014-9250-z

Mikhalev, A. B. (1995). The Theory of Phonosemantic field. Pyatigorsk.

Oxford English Dictionary 3 ed. https://www-oed-com.emedien.ub.uni-muenchen.de (date of consulting: 01.10.2022).

Sadowski, P. (2001). The sound as an echo to the sense. The iconicity of English gl- words. In O. Fischer & M. Nänny (Eds.), The Motivated Sign. Iconicity in language and literature 2 (pp. 69–88). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Smith, C. A. (2016). Tracking semantic change in fl- monomorphemes in the Oxford English Dictionary. Journal of Historical Linguistics 6:2, 165–200. https://doi.org/10.1075/jhl.6.2.02smi

Voronin, S. V. (2006). Fundamentals of Phonosemantics. St. Petersburg: IFL.

Willemsen, J. & Miltersen E. H. (2020). The expression of vulgarity, force, severity and size. Phonaesthemic alternations in Reta and in other languages. Studies in Language, 44:3, 659–699. https://doi.org/10.1075/sl.19073.wil

A robustness approach to operationalisations of iconicity

Bonnie McLean & Yasamin Motamedi

The complex processes behind construals of iconicity present a challenge for operationalisations of iconicity in scientific investigations. Here, we explore how the notion of 'robustness' from philosophy of science (e.g. Irvine et al., 2013; Levins, 1966; Weisberg & Reisman, 2008; Wimsatt, 1981) can be used to untangle the diverse mechanisms behind perceptions of iconicity, to build a comprehensive theory of iconicity as one of several factors that contribute to fitness between form and function. Through a series of case studies, we argue that construals of iconicity are not only dependent on resemblance but are shaped by experience and by the complex interactions that exist between iconicity and other kinds of motivated mappings (e.g. systematic and indexical mappings) in language. We suggest that a robustness approach to operationalizations of iconicity can be used to untangle the roles of these different factors, by considering the influences that stimuli, participants, contexts, representations, and framing have on construals of iconicity. Diversifying the viewpoints from which we examine iconicity, shifting objects of study from decontextualized signs to situated 'composite utterances', and triangulating insights from mixed quantitative and qualitative measures are key goals for future research. Under this approach, operationalizations of iconicity are not only a means to an end, but also an object of study in themselves; a way to explore where construals of iconicity come from and how they operate—which in turn enables us to design better measures of iconicity for the future.

References

Irvine, L., Roberts, S. G., & Kirby, S. (2013). A robustness approach to theory building: A case study of language evolution. *Proceedings of the 31st Annual Conference of the Cognitive Science Society*, 2614–2619.

Levins, R. (1966). The strategy of model building in population biology. *American Scientist*, *54*(4), 421–431.

Weisberg, M., & Reisman, K. (2008). The robust Volterra principle. *Philosophy of Science*, *75*(1), 106–131.

Wimsatt, W. C. (1981). Robustness, reliability, and overdetermination. *Scientific Inquiry and the Social Sciences*, 124–163.

Cuteness modulates size sound symbolism at its extremes

Dominic Schmitz
Heinrich-Heine-Universität Düsseldorf

The phenomenon of sound symbolism describes that certain sounds become meaningful when they are combined with other sensory information. One of the most prominent types of sound symbolistic patterns is the so-called "size sound symbolism". Speech sounds with high-frequency components are associated with smallness, while speech sounds with low-frequency components are associated with bigness (e.g. Tarte 1982; Knoeferle et al. 2017). While size sound symbolism is well researched in itself, there is barely any research available connecting size to other dimensions of appearance. The present investigation aims at providing evidence for this research gap.

The dimension of size has been under investigation in a multitude of studies on sound symbolism during the last decades (e.g. Berlin 1995; Blasi et al. 2016). A further dimension of appearance, however, has rarely been considered by research: cuteness. Cuteness can be understood as a more complex form of simple geometric shape, as has been studied before (e.g. Westbury et al. 2018; Bremner et al. 2013; D'Onofrio 2013). Cuteness, especially from its biological perspective as comprised in the so-called "baby schema" (Lehmann, Huis in't Veld & Vingerhoets 2013), is a fundamental feature of human perception and correlates, among other things, with size (Kringelbach et al. 2016). Research on Japanese has shown that cuteness is also found as sensory information to be combined with speech sound (Kumagai 2019).

Taking into account both dimensions, size and cuteness, the present investigation aims at establishing a relation from "small" to "big" and from "not cute" to "cute" for long vowels of Standard German (i.e. /aː, ɛː, eː, iː, oː, øː, uː, yː/), providing further insight into sound symbolism and its nature.

To gain evidence, an online forced-choice task was conducted using OpenSesame (Mathôt, Schreij & Theeuwes 2012). Disyllabic pseudowords were used as auditory stimuli, controlling for potentially confounding lexical (Caselli, Caselli & Cohen-Goldberg 2016; Gahl 2008) and contextual (Klatt 1976; Wightman et al. 1992) effects. In either syllable, stimuli's nuclei consisted of one of the vowels under investigation. The simplex onsets of the syllables consisted of one consonant, i.e. /d, f, j, k/ or /r/. There were no coda consonants. In total, 96 pseudowords, i.e. 12 per vowel, were used. Images of phantasy creatures (van de Vijver & Baer-Henney 2014) were used as visual stimuli. In each trial, participants were shown five differently sized versions of a randomly chosen creature. The participants' task was to decide which image version matched the audio stimulus of a trial best. As cuteness judgements most likely differ by participants, after the forced-choice part of the experiment, participants were again shown all creature images to judge them for their cuteness on a five point scale.

The size response then entered a generalised additive mixed model regression analysis as dependent variable. Cuteness judgments, vowel quality, as well as onset consonant types and phonological neighbourhood density were introduced as independent variables, while participant ID and age were included as random effects. Overall, /aː/ is considered bigger than all other vowels, while /uː, iː/ are considered smallest. Cuteness judgement ratings did not show a significant effect on their own. However, having vowel quality and cuteness judgements interact, a noteworthy pattern emerged: For the open vowel /aː/ and for the close front vowels /uː, iː/, the interaction reached significance. While the size judgements for /aː/ further increased with cuteness, the size judgements for /uː, iː/ further decreased.

The present findings demonstrate that the dimension of cuteness modulates the effect of size sound symbolism at its extremes. That is, with increasing cuteness, the vowel considered to be biggest is judged to be even bigger, while the vowels considered to be smallest are judged to

be even smaller. Sound symbolistic effects appear to manifest in an intricate interaction when multiple dimensions of sensory information are taken into account. The present findings contribute to the growing body of evidence for and the nature of sound symbolism and call for the incorporation of multiple dimensions of sensory information where applicable.

References

Berlin, Brent. 1995. Evidence for pervasive synesthetic sound symbolism in ethnozoological nomenclature. *Sound Symbolism*. Cambridge University Press 76–93. https://doi.org/10.1017/CBO9780511751806.006.

Blasi, Damián E., Søren Wichmann, Harald Hammarström, Peter F. Stadler & Morten H. Christiansen. 2016. Sound-meaning association biases evidenced across thousands of languages. *Proceedings of the National Academy of Sciences of the United States of America*. National Academy of Sciences 113(39). 10818–10823. https://doi.org/10.1073/PNAS.1605782113.

Bremner, Andrew J., Serge Caparos, Jules Davidoff, Jan de Fockert, Karina J. Linnell & Charles Spence. 2013. "Bouba" and "Kiki" in Namibia? A remote culture make similar shape–sound matches, but different shape–taste matches to Westerners. *Cognition*. Elsevier 126(2). 165–172. https://doi.org/10.1016/J.COGNITION.2012.09.007.

Caselli, Naomi K., Michael K. Caselli & Ariel M. Cohen-Goldberg. 2016. Inflected words in production: Evidence for a morphologically rich lexicon. *Quarterly Journal of Experimental Psychology* 69(3). 432–454. https://doi.org/10.1080/17470218.2015.1054847.

D'Onofrio, Annette. 2013. Phonetic Detail and Dimensionality in Sound-shape Correspondences: Refining the Bouba-Kiki Paradigm. SAGE Publications. UK: London, England 57(3). 367–393. https://doi.org/10.1177/0023830913507694.

Gahl, Susanne. 2008. Time and thyme are not homophones: The effect of lemma frequency on word durations in spontaneous speech. *Language* 84(3). 474–496. https://doi.org/10.1353/lan.0.0035.

Klatt, Dennis H. 1976. Linguistic uses of segmental duration in English: Acoustic and perceptual evidence. *The Journal of the Acoustical Society of America* 59(5). 1208. https://doi.org/10.1121/1.380986.

Knoeferle, Klemens, Jixing Li, Emanuela Maggioni & Charles Spence. 2017. What drives sound symbolism? Different acoustic cues underlie sound-size and sound-shape mappings. *Scientific Reports*. Springer US 7(1). 5562. https://doi.org/10.1038/s41598-017-05965-y.

Kringelbach, Morten L., Eloise A. Stark, Catherine Alexander, Marc H. Bornstein & Alan Stein. 2016. On Cuteness: Unlocking the Parental Brain and Beyond. *Trends in Cognitive Sciences* 20(7). 545–558. https://doi.org/10.1016/j.tics.2016.05.003.

Kumagai, Gakuji. 2019. A sound-symbolic alternation to express cuteness and the orthographic Lyman's Law in Japanese. *Journal of Japanese Linguistics*. Walter de Gruyter GmbH 35(1). 39–74. https://doi.org/10.1515/JJL-2019-2004.

Lehmann, Vicky, Elisabeth M.J. Huis in't Veld & Ad J.J.M. Vingerhoets. 2013. The human and animal baby schema effect: Correlates of individual differences. *Behavioural Processes*. Elsevier 94. 99–108. https://doi.org/10.1016/j.beproc.2013.01.001.

Mathôt, Sebastiaan, Daniel Schreij & Jan Theeuwes. 2012. OpenSesame: An open-source, graphical experiment builder for the social sciences. *Behavior Research Methods*. Springer 44(2). 314–324. https://doi.org/10.3758/s13428-011-0168-7.

Tarte, Robert D. 1982. The relationship between monosyllables and pure tones: An investigation of phonetic symbolism. *Journal of Verbal Learning and Verbal Behavior*. Academic Press 21(3). 352–360. https://doi.org/10.1016/S0022-5371.

Vijver, Ruben van de & Dinah Baer-Henney. 2014. Developing biases. *Frontiers in Psychology* 5. https://doi.org/10.3389/fpsyg.2014.00634.

Westbury, Chris, Geoff Hollis, David M. Sidhu & Penny M. Pexman. 2018. Weighing up the evidence for sound symbolism: Distributional properties predict cue strength. *Journal of Memory and Language*. Academic Press 99. 122–150. https://doi.org/10.1016/J.JML.2017.09.006.

Wightman, Colin W., Stefanie Shattuck-Hufnagel, Mari Ostendorf & Patti J. Price. 1992. Segmental durations in the cicinity of prosodic phrase boundaries. *Journal of the Acoustical Society of America* 91(3). 1707–1717. https://doi.org/10.1121/1.402450.

Nastazja Stoch

University of Warsaw

Linguistic diagrams may be classified in many ways. The most relevant typology of diagrams in this paper is the one created in regard to the type of mapping between the linguistic form and meaning. The mappings are formulated within the diagrammatic principles governing language, yielding an explanatory function of the motivation behind a given formal structure.

An overview of the typology of diagrammatic principles governing language exposed in the literature shows that it is not consistent. It required a meticulous analysis of different concepts under different names, often overlapping without explicit indication. It resulted in deriving three main diagrammatic principles in language: that of sequence, quantity, and proximity.

Iconicity of sequence has been often interchangeably used with iconicity of temporality and iconicity of linearity. Nöth's (1990) typology of syntagmatic diagrams was convincing enough to realize that iconicity of temporality and iconicity of linearity are merely subtypes of iconicity of sequence, because not any iconic sequence must be temporal or linear. It also proved that iconic temporality and linearity are distinctive. Therefore, after inspecting Nöth's proposal, I adapted this division of possible sequential diagrams in language between temporal sequence, spatial and conceptual sequence, the latter, in turn, being divided into causal, linear, and hierarchical sequence. The only modification to this proposal concerns moving causal sequence under the governance of temporal sequence (due to the argument that causality involves temporal perception of the cause-effect relation), and offering one more dimension of iconic sequence, namely, iconicity of epistemic sequence.

Iconicity of quantity has also been studied under different labels. In particular, the most often term associated with it is iconicity of complexity. However, I formulated arguments to view it as a subtype of iconicity of quantity. Another term related to the quantity diagram in language is markedness. I debunked the idea to identify iconicity of complexity with markedness, even though they partially overlap in the extension of instantiating them. Another confusion is caused by listing iconicity of repetition and iconicity of reduplication as (implicitly) disjunctive principle, although they are univocally prescribed under the overarching principle of quantity. I have then decisively classified the iconic principle of reduplication as specific type of the iconic principle of repetition being manifested on the morphological level. In result, the principle of quantity has two subtypes: repetition (having reduplication is its subtype) and complexity. Lastly, iconicity of absence was joined to this first-level division of types of iconic quantity, next to iconicity of intensification and informativeness, none of which could be subdued to neither repetition nor complexity in their entirety.

Iconicity of proximity may have required most clarification. I discovered that iconicity of distance, alienation, adjacency, cohesion and contiguity are indistinguishable concepts, defined in the same way as iconicity of proximity. However, after further inspection, I preserved only iconicity of distance as a true synonymy of iconicity of proximity. I excluded the plausibility of using the terms "cohesion" or "contiguity" to refer to iconicity of proximity by pointing out their conventionalized applications in describing different linguistic phenomena. "Iconicity of alienation" is similar to "iconicity of (in)alienability", therefore I did not use it extensively to not confuse it with (in)alienability, which I classified as a specific manifestation of iconicity of proximity. Iconicity of adjacency (divided into iconicity of grammatical adjacency and iconicity of head proximity) has been also defined to be a particular case of iconicity of proximity, next to iconicity of causal distance and juxtaposition.

References:

Givón, T. (1995(1991)). Isomorphism in the grammatical code: cognitive and biological considerations. In R. Simone (Ed.), *Iconicity in Language* (pp. 47-76). Amsterdam & Philadelphia: John Benjamins Publishing Company.

Greenberg, J. H. (1966). Some universals of grammar with particular reference to the order of meaningful elements. In J. H. Greenberg (Ed.), *Universals of Language* (2nd ed., pp. 73-113). Cambridge & London: The M.I.T. Press.

Haiman, J. (1985). *Natural Syntax: Iconicity and Erosion.* Cambridge: Cambridge University Press.

Haspelmath, M. (2008). Frequency vs. iconicity in explaining grammatical asymmetries. *Cognitive Linguistics, 19*(1), 1-33.

Hiraga, M. K. (1994). Diagrams and metaphors: Iconic aspects in language. *Journal of Pragmatics, 22*, 5-21.

Lacková, L. (2015). Iconicity and topic-focus sequentiality. *Czech and Slovak Linguistic Review, 1*, 44-55.

Leech, G. N., & Short, M. (2007). *Style in Fiction: A Linguistic Introduction to English Fictional Prose* (2nd ed.). Harlow: Pearson.

Newmeyer, F. J. (1992). Iconicity and generative grammar. *Language, 68*(4), 756-796.

Nöth, W. (1990). The semiotic potential for iconicity in spoken and written language. *Kodikas/Code: Ars Semiotica, 13*(3/4), 191-209.

Tai, J. H.-Y. (1985). Temporal sequence and Chinese word order. In J. Haiman (Ed.), *Iconicity in Syntax* (pp. 49-72). Amsterdam & Philadelphia: John Benjamins Publishing Company.

Van Langendonck, W. (2007). Iconicity. In D. Geeraerts, & H. Cuyckens (Eds.), *The Oxford Handbook of Cognitive Linguistics.* Oxford: Oxford University Press.

Wescott, R. W. (1971). Linguistic iconism. *Language, 47*(2), 416-428.

Iconicity of modified reduplication

Stephen Watters and Juha Yliniemi, SIL International

This article presents a cross-linguistic study on the iconicity of modified reduplication (MRD). Although the iconic potential of reduplication has been addressed by researchers (e.g. Sapir 1921: 79-82, Lakoff & Johnson 1980: 128, Fischer 2011), not enough attention, with some notable exceptions such as Cabrera (2017), has been paid to the distinct character of MRD in opposition to full reduplication. MRD here refers to the juxtaposition of two linguistic forms that are phonologically similar but not identical, differing in either vowel quality or initial consonant. Modification of vowel quality is also known as ablaut reduplication (e.g. English *chit-chat*, Lhasa Tibetan *zam zom* 'careless work', Tshangla *napanopo* 'silly') and modification of initial consonant is also known as rhyming reduplication (e.g. English *hotchpotch*, Finnish *hyrskyn myrskyn* 'in a state of disarray', Turkish *bulut mulut* 'cloud and the like').

Drawing data from a wide array of languages and languages families (e.g. Finnic, Germanic, Indic, Slavic, Tangkic, Tibetic and Turkic), our paper argues that MRD has cross-linguistically potential to express four types of iconicity in each of which the iconicity arises from the structural comparison (or perceiving the similarity and dissimilarity) of two juxtaposed similar but not identical phonological forms:

1) Duality/plurality of similar but not identical sounds, e.g. Finnish *pim pom* 'ding dong, sound of door-bell', Denjongke *tʻaŋtʻiŋ* 'cling clang', Bengali *ʈapur ʈupur* 'rain pattering'

2) Duality/plurality of similar but not identical items, e.g. Denjongke *dakdok* 'occurring as an assortment of small items of various sizes', Lhasa Tibetan *phap phop* 'cloths etc.', Nepali *khānā sānā* 'food and such things', Turkish *kapi mapi* 'door[s] and the like'

3) Duality/plurality of similar but not identical locations (e.g. Dzongkha *pchamchim* 'scattered, here.there', Lhasa Tibetan *thar thor* 'scattered'), also suggesting alternating motion between locations (e.g. Scots *hitherum ditherum* 'a drying wind [of eddying nature]', Tibetan *lang ling* 'drifting, swinging', Spanish/English *tiki taka* 'style of football characterized by short passing and movement') and reciprocity between two locations/persons (Bengali *mārā* 'hit' > *mārāmāri* 'violence, fighting', English *hobnob* 'to drink to each other [arch.]', Kayardild *junkuyunku* 'towards each other')

4) Nonnormativity arising from the comparison of two similar but non-identical forms: a) falling short of the norm, e.g. English *flim flam* 'deceptive nonsense', Tshangla *thapathopo* 'slow-witted', Lhasa Tibetan *'dzag ge 'dzog ge* 'pell-mell', Estonian *kiraldi-viraldi* 'badly, poorly', Turkish *okudu mokudu* 'read (PST) improperly, skimmed'; b) exceeding the norm, e.g. English *super-duper*, *teeny-weeny*

While the types of iconicity listed above have been hinted at by other researchers (e.g. Thun 1963, Fischer 2011, Armoskaite & Kutlu 2015, Cabrera 2017), this paper presents the first unified crosslinguistic study of the iconicity of MRD which highlights the similarity of ablaut reduplication and rhyming reduplication, and establishes an iconically-based common ground between such diversely labelled phenomena as "expressives" (Diffloth 1979), "ideophones" (Mikone 2001), "echo formations" (Abbi 2018) and "m-reduplication" (Armoskaite & Kutlu 2015).

The study also shows that similar but not identical forms occur in many languages on the paradigmatic level in personal and demonstrative pronouns, giving further evidence that MRD

has iconic potential to represent two or more locations, e.g. Swedish *här* ‘here’ vs. *där* ‘there’, Finnish *minä* ‘1SG’ vs. *sinä* ‘2SG’, Finnish (dialectal) *myö* ‘1PL’ vs. *työ* ‘2PL’ vs. *hyö* ‘3PL’.

References

Abbi, Anvita. Echo Formations and Expressives in South Asian languages. 2018. In Urdze, Aina (ed.), *Non-Prototypical Reduplication*, 1-34. Berlin, Boston: De Gruyter Mouton. https://doi.org/10.1515/9783110599329-001

Armoskaite, Solveiga & Kutlu, Ethan. 2015. Turkish m-reduplication: a case of similative number. *Turkic Languages* 18, 271–288.

Cabrera, Juan C. Moreno. 2017. Continuity and change: On the iconicity of Ablaut Reduplication (AR). In Bauer, Matthias; Fischer, Olga; Ljungberg, Christina & Zirker, Angelika (eds.), *Dimensions of Iconicity* (Iconicity in Language and Literature 15), 63-84. Amsterdam, Philadelphia: John Benjamins.

Diffloth, Gérard. 1979. Expressive phonology and prosaic phonology in Mon-Khmer. In Henderson, E. J. A; Thongkum, Theraphan; Phānuphong, Wičhin; Kullavanilaya, P.; Tingsabadh, M. R. K. (eds.), *Studies in Tai and Mon-Khmer Phonetics and Phonology in Honour of Eugénie J.A. Henderson*, 49-59. Chulalongkorn University Press.

Fischer, Olga. 2011. Cognitive iconic grounding of reduplication in language. In Michelucci, Pascal; Fischer, Olga.; and Ljungberg, Christina (eds.), *Semblance and Signification* (Iconicity in Language & Literature 10), 55–81. Amsterdam: John Benjamins. doi: 10.1075/ill.10.04fis

Lakoff, George & Johnson, Mark. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.

Mikone, Eve. 2001. Ideophones in the Balto-Finnic languages. In *Ideophones* [Typological Studies in Language 44], F. K. Erhard Voeltz & C. Kilian-Hatz (eds), 223–234. Amsterdam: John Benjamins. doi: 10.1075/tsl.44.18mik

Sapir, Edward. 1921. *Language: An Introduction to the Study of Speech.* New York: Harcourt, Brace and Company.

Thun, Nils. 1963. *Reduplicative words in English: A study of formations of the types* tick-tick, hurly-burly, *and* shilly-shally. Uppsala.