Research Article

Hilke Elsen*

The Two Meanings of Sound Symbolism

Abstract: This article deals with sound symbolism and the ways to interpret sound symbolic phenomena. Sound symbolism appears to be a universal phenomenon but linguists tend to neglect it or offer heterogeneous approaches and definitions. This paper is concerned with the role of motivation, as assumed in cases like *cuckoo*, and the question whether some sound symbolic effects might be the result of acquired statistical knowledge about the language system. The author argues that several aspects of sound symbolism such as natural/iconic or habitual relationships between sound and (facets of) referents interact but should be considered separately to gain a more realistic insight into the working of sound symbolism.

Keywords: Iconicity, definitions, size-sound symbolism, names, language universals, phonestheme

1 Introduction

Research on sound symbolism was never really popular, perhaps due to the dominance of Western European and US-American research and Ferdinand de Saussure's conclusion that the relation between form and meaning of the linguistic sign was arbitrary - except for a few onomatopoetic terms. Still, from time to time, authors would offer experiments and new ideas on sound symbolism, including some of the most cited ones such as Sapir (1929), Köhler (1929), Jespersen (1933), Jakobson (1971), French (1976), Ultan (1978), Hinton/Nichols/Ohala (1994) and Nuckolls (1999), to name just a few. Likewise, French and German publications contributed interesting insights, such as Uznadze (1924), Müller (1935), Wissemann (1954), Chastaing (1958ff.), Fónagy (1963), Peterfalvi (1964ff.), Ertel (1969) or Etzel (1983). Recently, the number of reports and experiments dealing with sound symbolism and its cross-linguistic implications is growing. Actually, Non-Indo-Germanic languages reveal much more sound symbolic lexemes than Indo-Germanic, e.g. Basque (Ibarretxe-Antuñano 2006), Turkish (Jendraschek 2002), Tamil (Yoshida 2012) or Japanese and Korean (Taylor 1966; Kim 1977; Ivanova 2006; Parault & Parkinson 2008; Akita 2011, 2013; Kantartzis et al. 2011). African languages and many others use a lot of ideophones, "marked words that depict sensory imagery" (Dingemanse 2012: 655 and cf. Dingemanse 2011; Childs 1994, 2015; Voeltz & Kilian-Hatz 2001; Dingemanse et al. 2016). Japanese dictionaries list around 4.500 sound symbolic words (Imai & Kita 2014; Oszmiańska 2001). For an overview cf. Volke (2007), Elsen (2016).

As for now, a generally accepted definition of sound symbolism is missing. On the one hand, authors postulate a natural relationship, cf. "the term 'sound symbolism', designating an inmost, natural similarity association between sound and meaning" (Jakobson & Waugh 1987: 182). On the other hand, we find characterizations such as "the sound of the spoken word-forms is felt to be appropriate to the meaning of the lexemes of which they are forms, though the words do not actually denote sounds or the source of sounds, illustrate the phenomenon known as sound-symbolism" (Lyons 1977: 104) or "[h]abitual association of a particular phoneme, or a category of phonemes, with a concept such as largeness or smallness, proximity or distance, beauty or ugliness, curved or angular shapes, and the like" (Anderson 1998: 340). Whereas a

*Corresponding author: Hilke Elsen, Augsburg University, Augsburg, Germany, E-mail: Hilke.Elsen@philhist.uni-augsburg.de

natural relationship is, among others, based on similarity or iconicity, cf. *smash!, clatter!,* some habitual associations can be acquired over time without being natural.

The most popular definition though is by Hinton et al. (1994: 1). The authors list several types of sound symbolism according to more or less intensity of relationship: With the help of *corporeal sound symbolism* speakers express emotional or physical states, e.g. sneezing, *ouch*!. *Imitative sound symbolism* concerns words mimicking sounds, such as *bang*! or *bow-wow*!. *Synesthetic sound symbolism* expresses non-acoustic information by speech sounds. Synesthesia deals with crossmodal associations. The term refers to the neurobiological condition of experiencing a combination of two different senses like hearing colours or tasting sounds (cf. Simner/Hubbard 2013). In Hinton et al.'s terminology synesthetic sound symbolism refers to movements or tactile properties represented by speech, e.g. *snap*!. Finally, *conventional sound symbolism* deals with frequent pairings of phonemes and aspects of meanings, e.g. *gl-* in *glimmer*, *glisten*, *glitter, glint,* often called phonesthemes. The first three types show more or less natural, iconic connections; the fourth one, though, might solely be based on a frequently occurring link. Sound symbolism is based on a natural association and, alternatively or additionally, a habitual one.

For the time being we will work with a broad as well as practicable definition:

> The term sound symbolism is used 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.
> (Nuckolls 1999: 228).

The question is whether sound symbolism should be defined on the basis of motivation alone.

2 Some sound symbolic phenomena

One of the most frequent correlations is that between high front vowels and smallness and *a/o*-sounds and large size. In Sapir's (1929) famous study, subjects were offered 60 pairs of artificial words such as *mil/mal*. They were told that these were foreign names for referents, e.g. a table. Participants of the study had to decide whether they referred to a small or a large one. Results were unanimous as the vast majority paired large objects with words containing /a/ (up to 96 %) and small objects with words containing /i/ (Sapir 1929: 225-239). Subsequently, similar experiments followed. In a recent study by Shinohara & Kawahara (2010) subjects with English, Chinese, Japanese and Korean as mother tongue took part. Stimuli consisted of doubled VC-syllables with /b, d, g, z – p, t, k, s/ and /i, u, e, o, a/. High and front vowels and voiceless consonants correlated positively with small size. In another study, Thompson & Estes (2011: 2392-2404) formed systematically varied artificial words with "large" and "small" sounds/ letters according to published results, such as /a, u, o, m, l, w, b, d, g/ (large) and /i, e, t, k/ (small). Their words consisted of CV-syllables with no, two, four or six "large" sound/letters and six, four, two or no "small" ones such as *wodolo* (exclusively "large" sounds) or *tibudo* (four "large" sounds, two "small" sounds). Referents were fantasy characters of different sizes. Subjects had to choose the best fitting word for a given character with the result that the larger the size of the referent, the higher was the number of "large" sounds in the word. These and several more experiments show size-symbolism for artificial words. Analyses of actual vocabulary yield less robust results, for descriptive as well as experimental studies (for experiments with real words cf. Dingemanse et al. 2016: 117-133). However, when comparing data about actual lexicon and artificial words, one gets interesting results: Slavic languages very often use lexemes with /a/ for small things, but in experiments with artificial words Russian and Ukrainian speakers judge /a/ to be 'big' and /i/ to be 'small' (Levickij 2013: 87). The same was found for Korean speaking subjects (Shinohara & Kawahara 2010). Sound symbolism exists, but it may be latent without being active all the time. It may be activated when a speaker feels entitled to express emotions like lengthening a sound to emphasize meaning (e.g., Feist 2013: 110) or when further information is lacking, e.g., when interpreting unknown or artificial words.

As Feist (2013: 107) already pointed out, articulation seems to be a crucial factor but not the only one. /i/ may be associated with small size because of the small opening of the mouth during articulation. It is

connected to high tongue position and a smaller mouth cavity, whereas /a/ is connected to low tongue position and larger mouth cavity. Listeners as well as speakers may find a natural relationship between the high frequencies of /i/ and smallness. This relation is acoustic, articulatory as well as kinaesthetic. Furthermore, we are used to hear high and light sounds in combination with small animals and persons. Small objects make high frequency sounds, large ones low frequency sounds. In his "frequency code", Ohala (1994) suggests biological backgrounds for some sound symbolic phenomena. One reason for the tendency to associate /i/ and /e/ with 'small' and therefore 'harmless' and therefore 'good' as opposed to dark vowels might be found in sexual and age related dimorphism of the vocal anatomy (cf. Ohala 1994), "sounds made by a confident aggressor [...] are typically rough and have a low F_0" (Ohala 1994: 329) and are connected with larger apparent size to give a dangerous impression. Back vowels and fricatives resemble threatening growls, roars and snarls and will be more suitable to name dangerous and evil creatures. This is another common sound symbolic correlation.

Thorndike (1945a, b) assumed that /k, g, x, kr/ or /gr/ sound unpleasant because we associate them with groaning, grunting and growling. Fónagy (1963: 70) interpreted /r/, velar and laryngal plosives such as /k/, /q/ and /ʔ/ as hard sounds as we need more effort for their production compared to /m/ or /l/. According to Fónagy, the glottal stop is especially aggressive and related to vomiting and indisposition.

Whissell (1999) characterized /g/ and (the English) /r/ as aggressive consonants. "Sounds that are produced towards the back of the throat (including /k/ and /g/) share some of the muscular responses characteristic of the negative and active emotions of disgust and anger. [...] The production of phonemes interacts with preprogrammed emotional responses in several ways. Phonemes that simulate the muscular reactions typical of an emotion may engender a perception of that emotion, and emotional responses that control breathing patterns and facial muscles may make it easier to produce some sounds and more difficult to produce others" (Whissell 1999: 43f.). In several experiments she showed that certain (classes) of phonemes are related to emotions. E.g., velars correlated with aggression and anger, whereas the lateral was found to be pleasant and gentle (Whissell 1999, 2000). The threatening effect of velars and uvulars is based on acoustic similarities. They resemble roars of dangerous animals, so that we associate aggression and menace because of our experiences. They sound harsh and hard because we need more energy for articulation. In contrast, nasals, laterals, glides, voiced consonants in general, /ā/, /i/, open syllables and the avoidance of consonant clusters are pleasant-sounding (Crystal 1995; Anderson 1998). These relationships are motivated as they seem to have a natural base which might be learned early in life, but they are independent of the language system.

3 Artificial names for science fiction and fantasy characters

In a recent study, names in science fiction and fantasy stories were analysed to examine a possible relationship between word formation pattern and group of referents (Elsen 2008). First, all names from 52 books were collected and analysed according to morphological structure and reference. All books were originally written in German.

A lot of names turned out to be transparent and to be formed according to morphological rules, e.g. *Roter Palast /Red Palace* or *Schwarzes Portal/ Black Portal*. Others showed a mix of unknown and known fragments such as *Terkonit, Ebulit, Molvedin* (metals) or *Amnesin, Energon, Erosan, Euphorit, Somnalin, Valoron* (drugs). Examples like these correspond to trade names from chemistry in using pseudo-morphs like *-in*, *-an*, *-on*, *-it* which sound scientific but do not carry a consistent meaning. The most interesting finding was the third group: artificially constructed words. These names, however, were obviously not used arbitrarily. For example, small and harmless characters were named *Krila*, a gnome, *Kelwitt,* an intelligent, innocent, dolphin-like creature, *Brin*, a young, good-natured prince, *Elim*, a childlike prince, or *Cir*, a small dwarf. The names for dangerous and evil beings like monsters, demons and orks showed back vowels and consonants, especially velar and uvular fricatives, often closed syllables and consonant clusters, cf. *Ch'tuon, Tairach, Azrathoth, Chrekt-Orn, Rrul´ghargop* or *An-Rukhbar*. Another group comprised positive, magnificent, potent and good-natured characters such as magicians, scholars or elf

knights. Their names preferably consisted of more than two syllables, most of them open, most with the vowel *a*[1] and no schwa. Only the last syllable very often is closed, there are few consonant clusters, cf. *Kalakaman*, *Rakorium Muntagonus* or *Athanasios*.

Female names usually end with *a*, cf. *Udora, Karyla, Chaka, Vella, Lalapeja*, some with *i*, cf. *Celi, Charilan-Chi* (queen of cat-people). Final schwa or final consonants are rare. Lastly, extremely exotic creatures show names which deviate from the typical German syllable structure, two syllables, the first one is stressed, the second one unstressed with schwa, and many consonant clusters such as *str-*, *pfl-*, *-tz*, *-mpf*, cf. *Pflaume* 'plum', *Straße* 'street', *Puppe* 'doll', *Suppe* 'soup', *laufen* 'to run'. One representative of an intelligent, highly developed, not humanoid species is named *Gijül*. So called Idones are *Fänu*, *Fren* and *Kurla*. The names of some of the cat-people are *Ciran*, *Croi* or *Ciaril. Dex, Ill, Fei, Wast, Milzenisdarinne, Sophoheilip, Themaktima, Deshdriag, Jil'man'mar'ter* or *Ceox* are further names for exotic creatures.

As names for unknown characters are not built arbitrarily we might argue that they deliver information via sound structure. The sound /i/ is used for small, harmless referents. Dark vowels and back fricatives resemble threatening growls, roars and snarls and trigger negative associations. They will indicate evil, foreign species more appropriately than forms with /i/ or /m/. But it is not only single sounds, but particular groups and patterns which recur repeatedly in relation to certain kinds of protagonists. To denote powerful, magnificent and positive characters a Latin-Greek-like sound shape is used with many *a*-sounds and open syllables because we associate "reliability, efficiency, authority, importance" and further positive characteristics. For exotic creatures the names deviate from the average sound German pattern as much as possible. To examine whether hearers/readers make use of sound symbolic cues and whether they connect names with the intended referents, an experiment was designed, inspired by Rosch (1973) (cf. Elsen 2008).

4 Method

Data analysis was based on names from science fiction and fantasy books originally written in German. Participants were 106 native speakers of German, 93 students, aged between 20 and 27 years, and 13 employees in an engineering office, aged between 32 and 52 years. They were asked to judge six names as more or less fitting for a referent ranging from *very* (1) to *not at all* (7). All names were taken from the books. Most of the names were artificial names except for, e.g. *Gina, Nana, Mark, Nord*. Questions and names were presented as a questionnaire. In a final section participants were given the opportunity to comment.

The questions were:

How appropriate is the name for a

1 - beautiful young woman? (*Klipp, Alani, Olda, Valeron Veit, Sartassa, Gorx*).

2 - ferocious, ugly, malignant monster? (*Gina, Ch'tuon, Eugalp, Tik, Chrekt-Orn, Ghuzdan*).

3 - small gnome with a high-pitched voice? (*Cromag, Raul Madsen, Krillri, Nana, Cir, Gurlo*).

4 - exotic, kind creature with three legs (*N'ehetu, Mark Nord, Cara, Gnoorat, Mu'ati, Cir*).

5 - good-natured, powerful magician? (*Rrul'ghargop, Nana, Galdalyn, Cuul, Oderich Finck, Salamir*).

5 Results

The following tables[2] list the mean ratings.

---

1 We are aware of the fact that letters represent sounds. <a> in German is pronounced /a, *a*/, <i> is pronounced /i, I/, <o> : /o, ɔ/, <u>: /u, ʊ/, stressed <e>: /e, ɛ/, unstressed <e> : schwa (/ə/).

2 Tables from Elsen (2008: 100-102).

Table 1: young woman

example	rating
Alani	1.90
Sartassa	2.54
Valeron Veit	4.56
Olda	4.58
Klipp	5.76
Gorx	6.64

Table 2: monster

example	rating
Chrekt-Orn	2.07
Ghuzdan	2.32
Eugalp	2.87
Ch'tuon	2.93
Tik	5.27
Gina	6.59

Table 3: gnome

example	rating
Krillri	1.52
Cir	1.81
Gurlo	3.58
Cromag	4.09
Nana	4.34
Raul Madsen	5.74

Table 4: exotic creature

example	rating
N'ehetu	2.21
Mu'ati	2.49
Cir	3.06
Gnoorat	3.35
Cara	3.78
Mark Nord	5.58

Table 5: powerful magician

example	rating
Galdalyn	1.56
Salamir	1.85
Cuul	4.05
Oderich Finck	4.10
Rrul'ghargop	4.25
Nana	5.56

The first finding is that all best examples were the names the authors of the stories had chosen for the depicted or similar characters: *Alani, Sartassa, Chrekt-Orn, Ghuzdan, Eugalp, Ch'tuon, Krillri, Cir, N'ehetu, Mu'ati, Galdalyn, Salamir*, ratings between 1.52 and 2.93. Participants rated correct names as best fitting without background information and context.

The second finding is that ratings were not gradual. There's a sudden rise between the ratings of the two correct names and the rest in table 1, 3 and 5, and between the four correct names and the rest in table 2. *Klipp, Gorx, Tik, Gina, Raul Madsen, Mark Nord* and *Nana* didn't fit at all, ratings between 5.27 and 6.64. Results in table 4 are not as obvious. The only definite difference is between the last name, *Mark Nord*, and the rest, probably because it sounds like an average human being and thus not exotic.

The names are not equally well suited for the referents. As they do not show morphological information, the ranking must be based on phonetic information, represented and accompanied by orthographic clues, cf. *N'ehetu*. Taken together, the judgements of the participants correlated with the authors' intentions although they had no textual information. Accordingly, they made use of the sound structure of the words[3].

6 Discussion

Subsequent to the experiment participants were asked to comment on their decisions to get to know more about the reasons why some names are better than others. Participants rated /a/ to be positive and friendly, thus fitting well with young women who are prototypically positive characters, antagonists are usually male. Light vowels and /a/, especially as a last sound, are very important for female names, whereas final consonants indicate males. Back consonants are perfect for malicious monsters because they are strongly suggestive of the sounds these creatures are supposed to produce. Accordingly, *Gina* is unsuitable because of the bright and beautiful connotations, whereas *Tik* has a cheerful and harmless effect. *Eugalp* only got average marks because it does not sound really negative. The monsters in the texts were described as more or less vicious. For example, the demon *Eugalp* is only moderately evil.

Single syllables sound harsh (and thus not female). Names with consonant clusters and few vowels were again thought to be harsh. High vowels were associated with small creatures and high-pitched voices.

The exotic beings in the experiment were presented as amiable and friendly in the stories. The best two names for exotic, good-natured creatures were *N'ehetu* and *Mu'ati* with initial nasals and the apostrophe as a graphic signal for foreignness. They lack back consonants. Proper names consisting of two familiar sounding parts such as *Raul Madsen* or *Mark Nord* are typical for human beings and thus not suitable for non-human creatures.

Good-natured, powerful magicians are preferably named *Galdalyn* and *Salamir*. They lack back consonants[4], the syllable structure is reminiscent of Latin and Greek. These languages contribute technical terms, which are associated with science, effectiveness and power, at least for speakers of German. These

---

3 apart from common knowledge about proper names.
4 A syllable-final <r> is vocalized in German, especially when unstressed.

associations are transferred to the names and the characters. In this case, sounds express meaning, but it is a kind of meaning which reflects phonotactic knowledge of the language system.

Results show that participants make use of sound structure to interpret characteristic features of the referents. However, not all of this information can be called natural or motivated. Size-symbolism in the names for small creatures and velars and uvulars in the names for malicious monsters are based on a natural and/or iconic relationship between sound and referent. In contrast, final /a/ as opposed to a consonant and Latin-Greek syllable structures can only be taken as acquired information about the language system. Final *a* is used in many languages to mark female names besides *i*, in contrast to final consonants for males (Lieberson & Mikelson 1995; Hough 2000; Lieberson & Bell 1992; Whissell 2001a, b; Oelkers 2003; Aksholakova 2014; Rüdebusch & Ewels 2016). This is part of a gestalt which is felt to be fitting for females, based on culture, custom and fashion. There's probably nothing natural or iconic in final *a* for females. The same is true for phonesthemes such as *gl-* for *glimmer*, *glitter* or *fl-* for *flee, fly, flow, flurry*. They seem to be restricted to a language or a language family. Furthermore - is there anything glittering in *gl-* when considering words like *gloat, gloom* or *glove*? Phonesthemes are said to exist in most languages, the question is whether they have a mere statistical background or not (e.g., Joseph 1994; Hutchins 1998; Abelin 1999, 2012; Magnus 2001; Bergen 2004; Drellishak 2006; Ivanova 2006) or if the ranges of interpretations are due to phonic variation or ambiguity, depending on neighbouring sounds or the whole lexeme (Feist 2013). Data indicate that both aspects, natural/iconic and habitual information, interact. Both Galdalyn and Rrul'ghargop are powerful beings, the first one good-natured, the second one evil and dangerous, in his name we find an accumulation of back phonemes. Another interrelation may be that not all sound symbolic cues are equal. For example, a small, good-natured creature living in swamps is called *Gwrgi - i* indicating smallness seems to be stronger than the effects of the back consonants. Of course, this study can only offer first hints; it may serve as an impulse for further studies with speakers other than German and with a more elaborate set of data.

As to universalism, natural correlations between sound and meaning should show in many, if not all, languages. Usually, universal/natural as well as language-individual phenomena are equally entitled to research on sound symbolism. When investigating sound symbolism we should be aware of the two aspects and consider both when looking for the universal aspects of sound symbolic words. Finally, a last remark concerning the type of data might be permitted. One of the questions research tries to answer is whether sound symbolism is grammatical or "a fixed part of fixed lexical entries" (Feist 2013: 113). It may well be that present lexical systems are not suited for demonstrating the existence of sound symbolism. Though sound symbolic words may be easy to acquire and to manage, social and technical development results in more and more concepts. More concepts require more words. Growing vocabularies need more contrasts between lexical items, otherwise, precise communication is endangered due to too many homonyms, ambiguities and misunderstandings. Large vocabularies depend on arbitrariness. Arbitrariness is necessary. Consequently, not all of our present lexical systems constitute a valid basis when looking for sound symbolism. Though we do find traces everywhere, experiments with artificial words present a more reliable basis to study sound symbolic effects.

Future research will have to disentangle results for natural and artificial data as well as natural/iconic or purely habitual effects to filter out prototypical sound symbolism such as /i/ for small referents. These are the best candidates for universals. As all four factors interact, this is probably the reason why comprehensive results are still missing.

References

Abelin, Åsa 1999. *Studies in Sound Symbolism. Gothenburg Monographs in Linguistics* 17. Göteburg.
Abelin, Åsa 2012. Relative frequency and semantic relations as organizing principles for the psychological reality of phonaesthemes. Hart, Christopher. *Selected Papers from UK-CLA Meetings* I. 128–145.
Akita, Kimi 2011. Toward a phonosemantic definition of iconic words. Michelucci, Pascal, Fischer, Olga, Ljungberg, Christina. *Semblance and Signification. Iconicity in Language and Literature* 10. Amsterdam et al. 3– 8.

Akita, Kimi 2013. The lexical iconicity hierarchy and its grammatical correlates. Elleström, Lars, Fischer, Olga, Ljungberg, Christina. *Iconic Investigations. Iconicity in Language and Literature* 12. Amsterdam et al. 331–349.

Aksholakova, Assem 2014. Proper name as a clue symbol of identity. *Procedia – Social and Behavioral Sciences* 112. 467– 471.

Anderson, Earl R. 1998. *A Grammar of Iconism*. Madison/London.

Bergen, Benjamin K. 2004. The psychological reality of phonaesthemes. *Language* 80.2. 290–311.

Chastaing, Maxime 1958. Le symbolisme des voyelles significations des "I". *Journal de psychologie normale et pathologique* 55. 403–423, 461–481.

Chastaing, Maxime 1962. La brillance des voyelles. *Archivum Linguisticum* 14. 1–13.

Chastaing, Maxime 1964a. Nouvelles recherches sur le symbolisme des voyelles. *Journal de psychologie normale et pathologique* 61. 75–88.

Chastaing, Maxime 1964b. L'opposition des consonnes sourdes et muettes a-t-elle une valeur symbolique? *Vie et langage* 147. 367–370.

Chastaing, Maxime 1965a. Dernières recherches sur le symbolisme vocalique de la petitesse. *Revue philosophique* 155. 41–56.

Chastaing, Maxime 1965b. Pop, fop, pof, fof. *Vie et langage* 159. 311–317.

Chastaing, Maxime 1966a. Si les "r" étaient des "l". *Vie et langage* 173. 468–474.

Chastaing, Maxime 1966b. Si les "r" étaient des "l". *Vie et langage* 174. 502–507.

Childs, George T. 1994. African ideophones. Hinton, Leanne, Johanna Nichols, John Ohala. *Sound Symbolism*. Cambridge. 178–204.

Childs, George T. 2015. Sound symbolism. Taylor, John R. *The Oxford Handbook of the Word*. Oxford. 284–302.

Crystal, David 1995. Phonaesthetically speaking. *English Today* 42. 11.2. 8–12.

Dingemanse, Mark. 2011. Ezra Pound among the Mawu. Ideophones and iconicity in Siwu. Michelucci, Pascal, Olga, Fischer, Ljungberg, Christina. *Semblance and Signification. Iconicity in Language and Literature* 10. Amsterdam et al. 39–54.

Dingemanse, Mark 2012. Advances in the cross-linguistic study of ideophones. *Language and Linguistics Compass*. 6/10. 654–672.

Dingemanse, Mark, Schuerman, Will, Reinisch, Eva, Tufvesseon, Sylvia, Mitterer, Holger 2016. What sound symbolism can and cannot do: Testing the iconicity of ideophones from five languages. *Language*. 92/2. 117–133.

Drellishak, Scott 2006. *Statistical Techniques for Detecting and Validating Phonesthemes*. Seattle, WA.

Elsen, Hilke 2008. *Phantastische Namen. Die Namen in Science Fiction und Fantasy zwischen Arbitrarität und Wortbildung*. Tübingen.

Elsen, Hilke 2016. *Einführung in die Lautsymbolik*. Berlin.

Ertel, Suitbert 1969. *Psychophonetik. Untersuchungen über Lautsymbolik und Motivation*. Göttingen.

Etzel, Stefan 1983. *Untersuchungen zur Lautsymbolik*. Dissertation Frankfurt/M.

Feist, Jim 2013. "Sound symbolism" in English. *Journal of Pragmatics* 45.1. 104–118.

Fónagy, Ivan 1963. *Die Metaphern in der Phonetik. Ein Beitrag zur Entwicklungsgeschichte des wissenschaftlichen Denkens*. The Hague.

French, Patrice L. 1976. Toward an explanation of phonetic symbolism. *Word* 28.3. 305–322.

Hinton, Leanne, Nichols, Johanna, Ohala, John 1994. *Sound Symbolism*. Cambridge.

Hough, Carole 2000. Towards an explanation of phonetic differentiation in masculine and feminine personal names. *Journal of Linguistics* 36. 1–11.

Hutchins, Sharon Suzanne 1998. *The Psychological Reality, Variability, and Compositionality of English Phonesthemes*. Dissertation. Ann Arbor.

Ibarretxe-Antuñano, Iraide 2006. *Sound Symbolism and Motion in Basque*. München.

Imai, Mutsumi, Kita, Sotaro 2014. The sound symbolism bootstrapping hypothesis for language acquisition and language evolution. *Philosophical Transactions of the Royal Society* B. 369. 2013.0298. 1–13.

Ivanova, Gergana 2006. Sound-symbolic approach to Japanese mimetic words. *Toronto Working Papers in Linguistics* 26. 103–114.

Jakobson, Roman 1971. Why "mama" and "papa"? Jakobson, Roman. *Selected Writings I. Phonological Studies*. Second, expanded edition. The Hague/Paris. 538–545 (orig. 1959).

Jakobson, Roman, Waugh, Linda R. 1987. *The Sound Shape of Language*. Berlin et al.

Jendraschek, Gerd 2002. *Semantische Eigenschaften von Ideophonen im Türkischen*. München.

Jespersen, Otto 1933. Symbolic value of the vowel i. Jespersen, Otto. *Linguistica. Selected Papers in English, French and German by Otto Jespersen*. 283–303 (orig. 1922).

Joseph, Brian D. 1994. Modern Greek *ts*: Beyond sound symbolism? Hinton, Leanne, Nichols, Johanna, Ohala, John. *Sound Symbolism*. Cambridge. 222–236.

Kantartzis, Katerina, Imai, Mutsumi, Kita, Sotaro 2011. Japanese sound symbolism facilitates word learning in English-speaking children. *Cognitive Science* 35.3. 575–586.

Kim, Kong-On 1977. Sound symbolism in Korean. *Journal of Linguistics* 13.1. 67–75.

Köhler, Wolfgang 1929. *Gestalt Psychology*. New York.

Levickij, Viktor V. 2013. Phonetic symbolism in natural languages. *Glottotheory* 4/1. 72-91.

Lieberson, Stanley, Bell, Eleanor O. 1992. Children's first names: An empirical study of social taste. *American Journal of Sociology* 98.3. 511–554.

Lieberson, Stanley, Mikelson, Kelly S. 1995. Distinctive African American names: An experimental, historical, and linguistic analysis of innovation. *American Sociological Review* 60.6. 928–946.

Lyons, John 1977. *Semantics* I. Cambridge et al.

Magnus, Margaret 2001. *What's in a Word? Studies in Phonosemantics*. Dissertation Trondheim, Norway.

Müller, Hermann 1935. *Experimentelle Beiträge zur Analyse des Verhältnisses von Laut und Sinn*. Potsdam/Berlin.

Nuckolls, Janis B. 1999. The case for sound symbolism. *Annual Review of Anthropology* 28. 225–252.

Oelkers, Susanne 2003. *Naming Gender. Empirische Untersuchungen zur phonologischen Struktur von Vornamen im Deutschen*. Frankfurt/M.

Ohala, John J. 1994. The frequency code underlies the sound-symbolic use of voice pitch. Hinton, Leanne, Nichols, Johanna, Ohala, John. *Sound Symbolism*. Cambridge. 325–347.

Oszmiańska, Aleksandra 2001. Sound symbolism as a universal drive to associate sound with meaning: A comparison between English and Japanese. *Poznań Studies in Contemporary Linguistics* 37. 147–155.

Parault, Susan J., Parkinson, Meghan 2008. Sound symbolic word learning in the middle grades. *Contemporary Educational Psychology* 33.4. 647–671.

Peterfalvi, Jean-Michel 1964. Étude du symbolisme phonétique par l'appariement de mots sans signification à des figures. *L'année psychologique* 64.2. 411–432.

Peterfalvi, Jean-Michel 1965. Les recherches expérimentales sur le symbolisme phonétique. *L'année psychologique* 65.2. 439–474.

Peterfalvi, Jean-Michel. 1970. *Recherches expérimentales sur le symbolisme phonétique*. Paris.

Rosch, Eleanor H. 1973. On the internal structure of perceptual and semantic categories. Moore, T. E. *Cognitive Development and the Acquisition of Language*. New York/London. 111–144.

Rüdebusch, Frauke, Ewels, Andrea-Eva 2016. Vornamen im Wandel der Zeit. *Der Deutschunterricht* 1/2016. 2–14.

Sapir, Edward 1929. A study in phonetic symbolism. *Journal of Experimental Psychology* 12. 225–239.

Shinohara, Kazuko, Kawahara, Shigeto (to appear). A cross-linguistic study of sound symbolism: The image of size. *Proceedings of the Berkeley Linguistic Society* 36. Berkeley. (Paper delivered 2010).

Simner, Julia, Hubbard, Edward M. 2013. *The Oxford Handbook of Synesthesia*. Oxford

Taylor, Insup Kim 1966. Kritik an Ertels und Dorsts expressiver Lautsymbolik. *Zeitschrift für experimentelle und angewandte Psychologie* 13. 100–109.

Thompson, Patrick D., Estes, Zachary 2011. Sound symbolic naming of novel objects is a graded function. *The Quarterly Journal of Experimental Psychology* 64.12. 2392–2404.

Thorndike, Edward L. 1945a. The association of certain sounds with pleasant and unpleasant meaning. *Psychological Review* 52. 143–149.

Thorndike, Edward L. 1945b. On Orr's hypotheses concerning the front and back vowels. *The British Journal of Psychology* 36.1. 10–14.

Ultan, Russell 1978. Size-sound symbolism. Greenberg, Joseph H., Ferguson, Charles A., Moravcsik, Edith A. *Universals of Human Language II. Phonology*. Stanford. 525–568

Usnadze, Dimitri 1924. Ein experimenteller Beitrag zum Problem der psychologischen Grundlagen der Namengebung. *Psychological Research/Psychologische Forschung* 5.1. 24–43.

Voeltz, Erhard F. K., Kilian-Hatz, Christa 2001. *Ideophones*. Amsterdam et al.

Volke, Stefan 2007. *Sprachphysiognomik. Grundlagen einer leibphänomenologischen Beschreibung der Lautwahrnehmung*. Freiburg/München.

Whissell, Cynthia 1999. Phonosymbolism and the emotional nature of sounds: Evidence of the preferential use of particular phonemes in texts of differing emotional tone. *Perceptual and Motor Skills* 89. 19–48.

Whissell, Cynthia 2000. Phonoemotional profiling: A description of the emotional flavour of English texts on the basis of the phonemes employed in them. *Perceptual and Motor Skills* 91. 617–648.

Whissell, Cynthia 2001a. Sound and emotion in given names. *Names* 49.2. 97–120.

Whissell, Cynthia 2001b. Cues to referent gender in randomly constructed names. *Perceptual and Motor Skills* 93. 856–858.

Yoshida, Hanako 2012. A cross-linguistic study of sound symbolism in children's verb learning. *Journal of Cognition and Development* 13.2. 232–265.