

Light Emission Verbs in English: An Investigation of Sound-Symbolic and Semantic Properties

Yoshiharu KUMAGAI

1. Introduction

This study explicates notable linguistic characteristics of English light emission verbs in terms of the relationship between their meanings and sound-symbolic properties by extending the analysis developed in Kumagai (2015, 2017, 2018). To achieve this purpose, this study considers the relevant verbs from Levin (1993: 233–238), who identified several verbs that “involve the emission of a stimulus or substance that is particular to some entity” (p. 233), including verbs of light emission, sound emission, smell emission, and substance emission. The light emission verbs are presented in (1), in the order presented by Levin, to which this study pays special attention:

(1) Verbs of Light Emission [from Levin (1993: 233–234)]

beam, blink, burn, blaze, flame, flare, flash, flicker, glare, gleam, glimmer, glint, glisten, glitter, glow, incandesce, scintillate, shimmer, shine, sparkle, twinkle

This article is partly based on Marchand’s insights (1960: Chapter VII) on the sound-symbolic properties of individual consonants and consonant clusters in the onset position. This study further investigates nuclear vowels’ articulatory characteristics inside the light emission verbs and attempts to determine their phonological effect on the immediately preceding and following consonants. The relationship between nuclear vowels’ perceptual properties and the meanings of the light emission verbs, especially in terms of the degree or strength of emission and the temporal emission property, is examined, thus exploring the possibility of applying the sound-symbolic approach to the verbs that do not emit sounds.

After summarizing my work on sound emission verbs in section 2, section 3 analyzes light emission verbs illustrated in (1), including a discussion on the characterization of phonemes and consonant clusters by Marchand (1960), and an extension of the analytical method developed in Kumagai (2015, 2017, 2018) to the verbs in question. The fourth section presents the findings.

2. Previous Studies

2.1. Kumagai (2015) on Verbs of Laughing

Most English words are assumed to follow phonological conventions of the language (Lass, 1984; Taylor, 1995), which are independent of words' meanings. Thus, the association of phonological forms with word meanings are considered arbitrary. Nevertheless, detecting a certain degree of connection between some phonemic or syllabic characteristics and the meanings of the words that such phonological elements comprise is sometimes possible, especially if the words in question signify, or are more or less related, to the sound.

A certain perceptual characteristic of a vowel was thought to be related to the values of the second formant (F2) and up (von Bismarck, 1974). Carlson, et al. (1975) proposed the order or degree of auditory brightness or vowel sharpness based on the “weighted average of the energy distribution at frequencies from the second formant (F2) upwards” [Cutler, et al. (1990: 478)]. Cutler, et al. (1990, Figure 3, p. 479) use this scale to argue for some significant gender differences in the distribution of nuclear vowels in English first names.

Kumagai (2015) explored notable phonological properties of the verbs of laughter in English, such as *cackle*, *chortle*, *chuckle*, and *giggle*, based on Levin's (1993) classification. The study showed that all the verbs investigated were etymologically imitative, mimicking the sound of laughter, although they do follow English's conventional syllabic pattern. The F2 value of nuclear vowels are likely to be associated with the types of laughter, and

the size, age, and gender of the sound emitters.

For example, verbs with a front nuclear vowel (e.g., /i:/, /ɪ/ and /æ/), which has a high F2 value, tend to correspond to laughter by children and women, because their voices are considered higher than adult males. Furthermore, the difference between the open-front vowel (/æ/) and the close-front vowel (/i:/ and /ɪ/) reflects the age difference among female sound emitters. Because the open-front vowel has a lower F2 value than the close-front vowels, a verb like *cackle* tends to be associated with the laughter of an elderly female, who has a relatively lower pitched voice compared to younger women. Notably, verbs with close-front nuclear vowels (e.g., *giggle*, *snicker*, and *snigger*) are likely to correspond to the laughter of younger women or children.

It was argued that the use of close-front vowels has a sound-symbolic association with laughter in a higher tone of voice compared to open vowels. The verbs with back vowels as a nucleus (e.g., *chortle*, *chuckle*, and *guffaw*), have a lower F2 value than close-front and open-front vowels. Thus, the verbs with back nuclear vowels tend to describe laughter by low-pitched, masculine sound emitters.

2.2. Kumagai (2017) on Verbs of Crying

The insights of Kumagai (2015) outlined in 2.1 were extended in Kumagai (2017) to the verbs of crying, where verbs such as *bawl*, *blubber*, *lament*, and *mewl*, were taken up from Levin (1993). These verbs, like the verbs of laughter, follow the typical English syllable structure; however, in terms of etymology, some verbs (i.e., *sob* and *weep*) have nonimitative origins. Additionally, the findings in Kumagai (2017) suggested that it is difficult to relate the brightness scale of nuclear vowels to the size, age, and gender of the sound emitters for crying verbs. Sound symbolism is more difficult to detect in such verbs, compared to the verbs of laughter.

Kumagai (2017) suggested that asymmetry in the degree of sound symbolism between verbs of laughter and crying may reflect a tendency in which crying involves intricate emotional factors and physical activities such as shedding tears and emitting sounds. Additionally, the act of crying may be exploited to ask for change or draw interlocutors' attention. These factors

obscure the relationship between the perceptual property of nuclear vowels and the size and gender of sound emitters, suggesting that sound symbolism traits should also be explored in the onset and coda.

2.3. Kumagai (2018) on Verbs of Sounds Made by Birds

Kumagai (2018) investigated stimuli external to humans by studying animal sounds. Among the many animal species that emit sounds, birds outnumber others in terms of the kinds of verbs depicting different sounds. Because many distinct verbs indicate sound emission within a single animal subcategory, individual verbs should exist for distinguishing diverse types of sounds.

This hypothesis was supported by the analytic method proposed in Kumagai (2015). Similar to the verbs of human laughter, the verbs of sounds made by birds (e.g., *tweet*, *twitter*, *caw*, *quack*, *gobble*, *cluck*, *coo*, and *hoot*) can be characterized systematically in terms of the F2 value of the nuclear vowels inside them. The nucleus tends to have a front vowel (high F2 value) if the verb refers to the sounds made by small birds (e.g., *cheep*, *tweet*, *chirrup*, *cackle*, and *chatter*), and a central to back vowel (low F2 value) if the verb refers to the sounds of larger birds (e.g., *caw*, *gobble*, *honk*, *crow*, *coo*, *cuckoo*, and *hoot*).

This study further investigated nuclear vowels' phonological effect on the neighboring consonants in the onset and coda positions. The internal structure of the stressed syllable is illustrated in (2). C_1 and C_2 represent the initial and final consonants in the syllable, respectively. V represents the nuclear vowel:

(2) Syllable Structure of Birds' Sound Emission Verbs

[_{Syllable} [_{Onset} C_1] [_{Rhyme} [_{Nucleus} V] [_{Coda} C_2]]]

where

- (i) V tends to be front if the verb refers to small birds, and central to back if it refers to large ones
- (ii) C_1 and C_2 tend to be voiceless
- (iii) The place of articulation of C_1 and C_2 may be close to the tongue position of V

- (iv) C_1 and C_2 may be identical, or similar in terms of the place of articulation

(Kumagai, 2018: 64–65, slightly modified)

In addition to the clearly sound-symbolic property exemplified in (i), further characteristics were observed in the phonotactics of the stressed syllables, as indicated in (ii)–(iv). If the nuclear vowel is the head of the whole syllable, and if the selection of a particular vowel reflects the meaning of the verb in terms of the sizes and other physical properties of birds, as argued in Kumagai (2018), then certain phonological properties of the vowel may be inherited in the preceding and following consonants. The properties illustrated in (iii) and (iv) are the cases in point.

However, the consonant's tendency to be voiceless may not be directly relevant to the birds' physical properties because the selection of voiceless segments is extended to most of the verbs of the sounds made by birds. Rather, the choice of voiceless segments may be more phonological than symbolic; the choice may serve to highlight the sonority of the nucleus¹. Thus, the sound-symbolic properties (i.e., the exploitation of a vowel's intrinsically symbolic character and its percolation to the neighboring segments) and phonological properties (i.e., conformation to the English syllable structure and highlighting the sonority of the nucleus) are codified into the stressed syllable.

3. Analysis of Light Emission Verbs

3.1. Hypotheses

This study proposes and discusses the following hypotheses. First, the sound-symbolic approach is applicable to light emission verbs, even though light emission does not involve sound emission. The sound-symbolic and phonesthetic characteristics of phonemes, consonant clusters, and syllables extend to emission verbs other than sound emission verbs, and are partly related to the meanings of such verbs, especially regarding the degree and

temporal property of emission. Second, the onset and coda may inherit some of their phonological properties from the nuclear vowels in a phonologically significant manner.

3.2. Relevance of Initial Consonants to Sound Symbolism

In his influential and comprehensive work on English word-formation, Marchand devoted one chapter to sound-symbolic characteristics inside words. Specifically, Marchand (1960: Chapter VII) divided words into initial symbols (i.e., consonantal phonemes and consonant clusters inside onset) and final symbols, or rimes². Let us look at his illustrations of consonants and consonant clusters and see whether the light emission verbs in (1) may be properly treated.³

Marchand's characterization of initial and final symbols is not necessarily corroborated etymologically, because dictionaries, such as the *Oxford English Dictionary* and the *Kenkyusha Dictionary of English Etymology*, do not provide meanings or phonesthetic images for phonemes or consonant clusters. These elements are, in many cases, smaller than bound morphemes. Some of Marchand's examples were nonimitative etymologically (e.g., *blow*, *bell*, and *glass*).

This study investigates the stressed syllable. Morphologically and syllabically complex words, such as *incandesce* and *scintillate*, are excluded from the analysis. Since frequentative morphemes, such as *-le* and *-er*, are independent weak syllables, they are treated separately. Marchand's descriptions are summarized in Table 1:

Light Emission Verbs in English

Table 1: Sound-Symbolic Properties of Initial Positions [Marchand (1960: 321–334)]

Initial Symbols	Meanings/Phonesthetic Images	Applicable to Light Emission Verbs?
/b/	<ol style="list-style-type: none"> “originally represent merely the sound made when the mouth is opened and at the same time imitate a softened explosion of sound” “[o]riginally imitative of sound, but now primarily expressive of the accompanying movement” <p>(7. 38.)</p>	<p><i>beam</i> No</p> <p><i>burn</i> No</p>
/bl/	<ol style="list-style-type: none"> “an initial symbol with many words expressing the idea ‘blow, blow up, swell’” “/b/ in combination with /l/ is often used to imitate, with protruded lips, the noise of a bubble, also the bubbling sound of confused blubber” <p>(7. 39.)</p>	<p><i>blink</i> Yes (= 1)</p> <p><i>blaze</i> Yes (= 1)</p>
/fl/	<ol style="list-style-type: none"> “an initial with words denoting movement, orig. flowing movement” “[f]lare in sense ‘shine, glare’ is the symbol blended with <i>glare</i>, but otherwise the etymology of the word is not clear” <p>(7. 56.)</p>	<p><i>flame</i> Yes (= 1)</p> <p><i>flare</i> Yes (= 1, 2)</p> <p><i>flash</i> Yes (= 1)</p> <p><i>flicker</i> Yes (= 1)</p>
/gl/	<ol style="list-style-type: none"> “an initial with words expressive of the idea ‘light, shine’” “[a]s an English word-forming element we have /gl/ in ‘look’ words” <p>(7. 53.)</p>	<p><i>glare</i> Yes (= 1)</p> <p><i>gleam</i> Yes (= 1)</p> <p><i>glimmer</i> Yes (= 1)</p> <p><i>glint</i> Yes (= 1)</p> <p><i>glisten</i> Yes (= 1)</p> <p><i>glitter</i> Yes (= 1)</p> <p><i>glow</i> Yes (= 1)</p>
/ʃ/	<ol style="list-style-type: none"> “has not been very productive” “[t]he initial is emotionally expressive in the exclamation” <p>(7. 73.)</p>	<p><i>shimmer</i> No</p> <p><i>shine</i> No</p>
/sp/	<ol style="list-style-type: none"> “found at the beginning of many words expressing jet movement” “[m]any of the words imply the idea ‘reject’ or ‘spit’” <p>(7. 35.)</p>	<p><i>sparkle</i> Yes (= 1)</p>

/tw/	<p>1. “an initial occurring with several words denoting small sounds or small, chiefly twisting, movements”</p> <p>2. “[m]any words denote tremulating sounds of birds or such as are caused by the plucking of an instrument”</p> <p style="text-align: right;">(7. 62.)</p>	twinkle Yes (= 1)
------	---	-------------------

A sound-symbolic or phonesthetic characterization of a single phoneme (i.e., /b/ and /f/) does not seem to apply to light emission verbs. The meanings are either irrelevant or too vague to signify light emission; however, the initial consonant clusters reflect part of their meanings, although the degree of applicability varies. Marchand referred directly to the word *flare*. A consonant cluster /gl/ represents the meaning of light. Regardless of the degree of applicability, the consonant clusters indicate that light emission is a movement phenomenon.

3.3. Phonological and Etymological Properties of Light Emission Verbs

Table 2 summarizes etymological, phonemic, and syllabic properties of the verbs in question. The etymological information is based on descriptions found in either the *Longman Dictionary of Contemporary English for Advanced Learners (LD)*, the *Oxford English Dictionary (OED)*, or the *Kenkyusha Dictionary of English Etymology*. The word “yes” indicates that any of the aforementioned sources provided the imitative origin of the word in question:

Table 2: Etymological and Phonological Properties of the Light Emission Verbs (19)

Verb	Imitative Origin?	No. of Syllables	Linear Order of Phonemes
beam	No	1	/CVVC/
blink	No	1	/CCVCC/
burn	No	1	/CVVCC/
blaze	No	1	/CCVVC/

Light Emission Verbs in English

flame	No	1	/CCVVC/
flare	No	1	/CCVVC/
flash	Yes	1	/CCVC/
flicker	Yes	2	/CCVC/+ /-ə/
glare	No	1	/CCVVC/
gleam	No	1	/CCVVC/
glimmer	No	2	/CCVC/ + /-ə/
glint	No	1	/CCVCC/
glisten	No	2	/CCVC/ + /-ən/
glitter	No	2	/CCVC/ + /-ə/
glow	No	1	/CCVV/
shimmer	No	2	/CVC/ + /-ə/
shine	No	1	/CVVC/
sparkle	No	2	/CCVVCC/ + /-əl/
twinkle	No	2	/CCVCC/ + /-əl/

First, all the verbs conform to the well-formed structure of the stressed syllable. Second, there are only two instances out of 19 whose meanings have etymologically imitative origins. This distribution pattern is remarkably different from the cases of the verbs of laughter [all nine examples investigated (Kumagai, 2015: 27–28)] and the verbs of bird sounds [22 out of 24 (Kumagai, 2018: 56–57)].

According to the *LD*, *flash* originally referred to the sound of liquid striking a surface. Terasawa stated in the *Kenkyusha Dictionary of English Etymology* that *flicker* is imitative and closer in meaning to *flutter*, namely, mimicking the sounds of birds when they move their wings lightly up and down. Likewise, the *OED* regards *flicker* as “an onomatopœic formation with frequentative suffix,” which expresses “repeated quick movement similar to that expressed by *flacker*, but slighter or less noisy.” Although light emission per se does not emit sound (at least not to the degree in which it is audible to human ears), words with imitative origins have meanings related to the sound (e.g., birds’ moving wings); thus, the sound-symbolic property can be

extended to the meanings of the emission verbs that do not involve sound.

3.4. Nuclear Vowels of Sound Emission Verbs

The verbs illustrated in Table 2 are re-classified to investigate the relevance of nuclear vowels to the sound-symbolic nature of the meanings of these verbs. These pieces of information are based on the definition in the *LD* and, if necessary, the *OED*. For diphthongs, only the first element is considered.

3.4.1. Verbs with Front Nuclear Vowels

Table 3 summarizes two semantic dimensions of the sound emission verbs with front vowels as their nuclei. Words containing the frequentative suffix (*-le* and *-er*) are syllabified, with only the initial syllable examined. Most of the verbs analyzed (16/19) have front vowels as nuclei. As Kumagai (2015, 2018) argued, the vowels were associated sound-symbolically, because of their high F2 values, with the laughter in a high tone of voice, and with the sounds made by small birds. By contrast, back vowels are likely to be associated, because of their low F2 values, with the laughter by low-pitched and rather masculine sound emitters and with the sounds made by large birds.

Thus, this study applies the F2–size correspondence hypothesis to the degree and temporal property of light emission verbs. *AC* represents the judgment by an informant from the United States who responded to my multiple-choice queries regarding relevant properties. For example, the degree of light emission expressed by the verb *beam* is considered by *AC* as always strong (i.e., Alternative 1) and always bright (= 3). I also quoted relevant definitions and descriptions from the *LD*:

Light Emission Verbs in English

Table 3. Light Emission Verbs with Front Nuclear Vowels (16)

Verb	Nuclear Vowel	Degree of Light Emission (Alternatives AC chose from)	Temporal Property of Light Emission (Alternatives AC chose from)
		<ol style="list-style-type: none"> 1. always strong 2. always weak 3. always bright 4. always faint 5. from strong to weak 6. from bright to faint 7. from weak to strong 8. from faint to bright 	<ol style="list-style-type: none"> 1. steady/continuant (no end-point) 2. gradual change (from strong to weak) 3. gradual change (from bright to faint) 4. gradual change (from weak to strong) 5. gradual change (from faint to bright) 6. momentary (one-time emission only) 7. strong and on-and-off quickly 8. bright and on-and-off quickly 9. strong and on-and-off slowly 10. bright and on-and-off slowly 11. weak and on-and-off quickly 12. faint and on-and-off quickly 13. weak and on-and-off slowly 14. faint and on-and-off slowly
beam	Close /i:/	1, 3 (AC) “send out a line of light, heat, energy, etc.” (LD)	3 (AC)
gleam	/i:/	2, 4 (AC) “shine softly” (LD)	1 (AC)
blink	Close /ɪ/	1, 3 (AC) “shine unsteadily” (LD)	7~14 (AC) “go on and off quickly” (LD)
flick-er	/ɪ/	5~8 (AC) “burn or shine with an unsteady light” (LD)	11 and 12, followed by 13 and 14 (AC) “goes on and off quickly” (LD)
glim-mer	/ɪ/	2, 4 (AC) “shine with a light that is not very bright” (LD)	1, 2, 3, 14 (AC)

glint	/ɪ/	1, 3 (AC) “[of a shiny surface] gives out small flashes of light” (LD)	6 (AC) “gives out small flashes of light” (LD)
glisten	/ɪ/	2, 4 (AC) “shine and look wet or oily” (LD)	1, 11, 13 (AC)
glit-ter	/ɪ/	2, 4 (AC) “shine brightly with flashing points of light” (LD)	8 (AC) “with flashing points of light” (LD)
shim-mer	/ɪ/	2, 4 (AC) “to shine with a soft light that looks as if it shakes slightly” (LD)	11, 12 (AC)
twin-kle	/ɪ/	2, 4 (AC) “shines in the dark with an unsteady light,” “shine in the dark in a way that seems to change from bright to faint” (LD)	8 (AC) “shines in the dark with an unsteady light,” “shine in the dark in a way that seems to change from bright to faint” (LD)
blaze	Close-Mid /eɪ/	1, 3 (AC) “shine with a very bright light” (LD)	1, 2, 3 (AC) “if guns blaze, they fire bullets quickly and continuously” (LD)
flame	/eɪ/	1, 3 (AC) “become suddenly bright with light or colour, especially red or orange” (LD)	6, 7, 8 (AC) “become suddenly bright” (LD)
flare	Open-Mid /ɛə/	1, 3 (AC) “suddenly begin to burn,” “burn more brightly for a short time” (LD)	6, 7, 8 (AC) “suddenly begin to burn,” “burn more brightly for a short time” (LD)

Light Emission Verbs in English

glare	/ɛə/	1, 3 (AC) “shine with a very strong bright light which hurts your eyes” (LD)	1 (AC)
flash	Open /æ/	1, 3 (AC) “shine suddenly and brightly for a short time” (LD)	6 (AC) “shine suddenly and brightly for a short time,” “shine brightly for a very short time, or to shine on and off very quickly many times” (LD)
shine	Open /aɪ/	1, 3 (AC) “produce bright light” (LD)	1 (AC)

There is no serious contradiction between the judgment of *AC* and the definitions of *LD*, except for the verbs *twinkle* (“always weak and always faint” (*AC*) versus “unsteady light (*LD*)”) and *glitter* (“always weak and always faint” (*AC*) versus “shine brightly” (*LD*)), in the strong–weak or bright–faint dimension. More importantly, as far as the verbs with close nuclear vowels (i.e., /ɪ/ and /i:/) are concerned, we observe some diversity in the degree of light emission and in the judgment or definitions of a few verbs by *AC* and the *LD*. Overall, verbs with a close-front vowel can be characterized as emitting rather unsteady light. As the vowel becomes more open (i.e., /eɪ/, /ɛə/, /æ/, and /aɪ/), it signifies stronger and steadier light. Notably, open-front nuclear vowels (i.e., the vowels with lower F2 values than close-front vowels) do not entail the transition from the bright to faint light, as the responses by *AC* indicate. Regarding the verbs with close-mid to open-mid and open vowels (e.g., *flare*, *glare*, *flash*, and *shine*), no contradiction is observed between the judgment by *AC* and the definitions of the *LD*, in terms of the strength of light emission.

By contrast, no clear correspondence was observed between nuclear vowels’ perceptual properties and the temporal dimension of the light emission verbs. The transition from a close-front to an open-front vowel, which indicates the transition from a higher to lower F2 value, or from a narrow vocal tract to a wider tract, may enhance the meaning of the strength

of emission.

3.4.2. Verbs with Central and Back Nuclear Vowels

This subsection discusses the central and back vowels in Table 4, which have lower F2 values than the front vowels:

Table 4. Light Emission Verbs with Central and Back Nuclear Vowels (3)

Verb	Nuclear Vowel	Degree of Light Emission 1. always strong 2. always weak 3. always bright 4. always faint 5. from strong to weak 6. from bright to faint 7. from weak to strong 8. from faint to bright	Temporal Property of Light Emission 1. steady/continuant (no end-point) 2. gradual change (from strong to weak) 3. gradual change (from bright to faint) 4. gradual change (from weak to strong) 5. gradual change (from faint to bright) 6. momentary (one-time emission only) 7. strong and on-and-off quickly 8. bright and on-and-off quickly 9. strong and on-and-off slowly 10. bright and on-and-off slowly 11. weak and on-and-off quickly 12. faint and on-and-off quickly 13. weak and on-and-off slowly 14. faint and on-and-off slowly
burn	Open-Mid, Central /ɜ:/	1, 3 (AC) “shines or produces light” (LD)	1 (AC)
spar-kle	Open, Back /ɑ:/	1, 3 and sometimes 2, 4 (AC) “shine in small bright flashes” (LD)	7, 8 (AC) “shine in small bright flashes” (LD)

Light Emission Verbs in English

glow	Close-Mid, Back /oo/	1, 3 and sometimes 2, 4 (AC) “produce or reflect a soft steady light,” “(especially literary) to shine with a warm soft light” (LD)	1 followed by 7~14 (AC) “produce or reflect a soft steady light” (LD)
------	-------------------------	--	---

AC regards all the verbs in Table 4 as strong and bright, although she thinks that *sparkle* and *glow* may sometimes indicate weak and faint light. She makes intriguing comments on the degree of light emission. As for *sparkle*, she reports:

“Although smaller in scale than verbs such as *blaze* or *flame*, sparkling does not infer weakness or lack of brightness in my opinion, but rather light being emitted intensely in small amounts.” (P.C.)

For *glow*, she writes:

“Although much softer than verbs such as *blaze* and *flame*, glowing does not infer weakness or lack of brightness in my opinion, but rather light being emitted softly but not necessarily weakly.” (P.C.)

These observations indicate that neither *sparkle* nor *glow* is positively used to express weak or faint light. Thus, verbs with central or back vowels as nuclei are likely to indicate rather strong and bright emission. As with front vowels, it is difficult to correlate the perceptual properties of nuclear vowels and the temporal dimension of the light emission verbs.

3.5. Consonants Inside the Stressed Syllable: Attraction by Nucleus?

Kumagai (2018: 64–65) argued that sound emission verbs of birds reveal intriguing phonological properties: (i) the correlation between F2 values

of nuclear vowels and birds' size, (ii) the tendency of the initial and final consonants to be voiceless, (iii) the similarity of the tongue position of the nuclear vowel and the places of articulation of initial and final consonants, and (iv) the phonological identity or similarity between the initial and final consonants. As for (ii) to (iv), none of these properties appears applicable to the light emission verbs investigated in this study.

4. Concluding Remarks

A sound-symbolic or phonesthetic characterization of consonants (i.e., /b/ and /f/) is not entirely applicable to light emission verbs; however, the initial consonant clusters are observed to reflect part of their meanings. Although degrees of applicability may vary, the consonant clusters are observed to indicate that light emission is a movement phenomenon.

Although all light emission verbs conform to the well-formed structure of the stressed syllable, only two instances out of 19 have meanings of etymologically imitative origins, in contrast to the verbs of laughter and verbs of sounds made by birds. Even though light per se does not emit sound, words with imitative origins have meanings related to the sound. Thus, the sound-symbolic property can be extended to the meanings of the emission verbs that do not involve sound.

As for the sound-symbolic characteristics of nuclear vowels, verbs with a close-front vowel can be characterized as emitting rather unsteady light; however, as the vowel becomes more open (i.e., /eɪ/, /ɛə/, /æ/, and /aɪ/), the verbs tend to signify a strong and steady light. The transition from a close-front to an open-front vowel indicates the transition from a higher to lower F2 value, or from a narrow to wide vocal tract, which is argued to enhance the meaning of the strength of emission. Additionally, no clear correspondence was observed between the perceptual properties of nuclear vowels and the temporal dimension of the light emission verbs.

As for the phonological properties proposed in Kumagai (2018: 64–65) regarding the sound emission verbs of birds [i.e., (i) the correlation between the F2 value of nuclear vowels and sound-emitter's size, (ii) the tendency

of the initial and final consonants to be voiceless, (iii) the similarity of the tongue position of the nuclear vowel and the places of articulation of initial and final consonants, and (iv) the phonological identity or similarity between the initial and final consonants], only the first property seems applicable to the light emission verbs investigated in this study, in that there seems to be a partial relationship between F2 values and the degree of light emission.

Notes

- 1 This characterization contradicts my view in Kumagai (2015: 30–31), where I proposed that the distinction between *snicker* and *snigger* may reflect the sizes of sound emitters, and that the crucial difference is in the choice of the voiceless (/k/) or voiced (/g/) consonant. This phenomenon occurs because, other things (i.e., manner and place of articulation) being equal, the voiceless consonant is higher in pitch (Ladefoged, 1982: 168–170) and easily associated with a sound emitter having a small vocal tract. One native speaker of English reported to me that likely emitters of *snicker* may include women and girls, whereas *snigger* may indicate rather masculine laughter, although she also commented that girls and women also snigger. By contrast, Marchand (1960: 343) stated that the difference is “often one of dialect only or of earlier and later usage.” Likewise, the *Longman Dictionary of Contemporary English for Advanced Learners* regards *snicker* as a word in American English and *snigger* as the equivalent in British English. A further study would resolve the question of whether and how much the voiced-voiceless opposition of consonants is relevant to sound symbolism in English.
- 2 The notion *rime*, employed by Marchand, is to be taken as equivalent in meaning to *rhyme* in this article.
- 3 Although he admits that rime plays “a part in the derivation of symbolic words” (p. 335), Marchand (1960: 335–341) merely lists relevant forms (e.g., *-abble*, *-eeze*, *-ick*, *-oom*, *-uddle*) and examples (e.g., *babble*, *rabble*, *sneeze*, *wheeze*, *prick*, *flick*, *boom*, *zoom*, *cuddle*, *fuddle*), sporadically illustrating the semantic properties of such forms. Another problem is that he does not distinguish between syllables and occasionally includes a frequentative morpheme (e.g., *-le* in *-abble* and *-uddle*) as examples of the final symbols, although such a morpheme constitutes an independent weak syllable. Thus, the details of his characterization are not investigated in this article.

Acknowledgments

I would like to thank Andrea Carlson of Aichi Prefectural University, for her kindness and patience as an informant. Much of the information on the minute nuances of light emission verbs provided in this article is based on her intuition. All the errors in this article are my own. This research was supported in part by the Aichi Prefectural University President's Special Research Grant in 2018.

References

- Bismarck, Gottfried von. 1974. Timbre of steady sounds: A factorial investigation of its verbal attributes. *Acustica* 30(3). 146–159.
- Carlson, Rolf, Gunnar Fant & Björn Granström. 1975. Two-formant models, pitch and vowel perception. In Gunner Fant & M. A. A. Tatham (eds.), *Auditory analysis and perception of speech*, 55–82. London: Academic Press.
- Cutler, Anne, James McQueen & Ken Robinson. 1990. Elizabeth and John: Sound patterns of men's and women's names. *Journal of Linguistics* 26(2). 471–482.
- Kumagai, Yoshiharu. 2015. Traits of sound symbolism in English verbs: Evidence from the verbs of laughing. *Mulberry* 65. 25–38.
- Kumagai, Yoshiharu. 2017. Some problems in exploring the traits of sound symbolism: A case study of verbs of crying. *The Journal of the Faculty of Foreign Studies (Language Literature), Aichi Prefectural University* 49. 21–34.
- Kumagai, Yoshiharu. 2018. Linguistic and symbolic properties of sound emission verbs: A case study of birds and its theoretical implications. *The Journal of the Faculty of Foreign Studies (Language Literature), Aichi Prefectural University* 50. 49–68.
- Ladefoged, Peter. 1982. *A Course in Phonetics*, 2nd edn. New York: Harcourt Brace Jovanovich.
- Lass, Roger. 1984. *Phonology: An introduction to basic concepts*. Cambridge: Cambridge University Press.
- Levin, Beth. 1993. *English verb classes and alternations: A preliminary investigation*. Chicago and London: The University of Chicago Press.
- Marchand, Hans. 1960. *The categories and types of present-day English word-formation: A synchronic-diachronic approach*. Wiesbaden: Otto Harrassowitz.
- Taylor, John R. 1995. *Linguistic categorization: Prototypes in linguistic theory*, 2nd edn. Oxford: Oxford University Press.

Dictionaries

The Kenkyusha dictionary of English etymology. 1997. Tokyo: Kenkyusha.

Longman dictionary of contemporary English for advanced learners, 5th edn. 2009.

Harlow, Essex: Pearson Education Limited.

Oxford English dictionary, 2nd edn. 1989. Oxford: Oxford University Press.

英語における光放出動詞の音象徴的特徴と 意味的特徴の研究

熊谷吉治

本論文は、光の放出という意味を表す動詞に焦点を当て、核母音の音響的性質と、動詞が表す光の明るさや強さ、そして時間の経過に伴う光の性質の変化との関係を調査した。また、核母音周辺の子音の配列や当該子音と核母音の舌位置の類似性などについても分析した。その結果、次のことが明らかになった。

光放出動詞の子音について Marchand (1960) の分析に基づいて調査したところ、頭子音の結合 (/f/, /g/) などが、光の放出を表すイメージにつながるものが窺えた。また、光の放出は物体の移動現象と捉えられることもわかった。

調査した19の光放出動詞のうち、語源的に擬音語や擬態語と判断できるのは *flash* と *flicker* のみであった。光の放出自体は知覚可能な音声を伴っていないが、*flash* は液体が表面をたたく音を、*flicker* は鳥の羽ばたき音を反映していることから、二つの動詞は語源的に音に関わる意味を持っており、音象徴的な分析を光放出動詞に拡張する可能性を示唆している。

高めの前舌母音 (/i:/, /ɪ/) を核に持つ光放出動詞は、表す意味に多様性が見られ、明るさや強さが不安定な光を意味する傾向が見られた。一方、核母音が真ん中から低めの前舌母音 (/eɪ/, /ɛə/, /æ/, /aɪ/)、さらには中舌母音・後舌母音 (/ɜ:/, /ɑ:/, /oʊ/) へと推移するに従い、明るくて強く、安定した光を意味する傾向が見られた。舌位置の降下や後退は、F2の値が下がったり、調音の際に声道が広くなったりすることを意味しており、母音の周波数が低くなることで、光放出の強さが意味的に明確になると考えられる。一方、母音の周波数の変化が時間の経過に伴う光の性質の変化と対応する証拠を見いだすことはできなかった。

最後に、核母音周辺の子音配列や当該子音と核母音の舌位置の類似性 (①頭子音と尾子音が無声音になりやすいか、②頭子音や尾子音の調音点が核母音の舌位置に近いか、③頭子音と尾子音が同一ないしは類似した音素になりやすいか) については、一貫した傾向を見いだすことはできなかった。