Baa Baa Black Sheep: Treatment of Words for Animal Sounds in Two Online English Dictionaries

Satu Manninen (Lund University)

Maria Wiktorsson (Malmö University)

Abstract

The paper examines the entries of 36 words for common animal sounds in two online English dictionaries, *Cambridge Dictionaries* and *The Merriam-Webster.com Dictionary*, to see what information is provided in the entries. Previous work on English dictionaries has focused on meaning explanations of referential, arbitrary words. With the examination of onomatopoeic words for animal sounds, this paper expands the field beyond the study of arbitrary words and into words whose forms contribute to their meaning.

The results show that there are no consistent policies for how words for animal sounds are handled, or how the animal readings are separated from other possible meanings of the words. There is variation in how explicitly the animals are mentioned in the definitions of meaning, and if they are in fact mentioned at all. The entries for the verb and noun uses of the words may not contain the same information. The examples, in cases where the animal readings are exemplified at all, may come in a different entry from where the relevant definition of meaning is provided. One of the dictionaries also relies heavily on definitions where the word's meaning is explained in terms of itself. The use of synonyms in the meaning explanations of onomatopoeic words is also found to be problematic. As these words do not merely identify a referent, but describe or imitate what the referent sounds like, exchanging one word for another does not carry over the same imagery of sound.

Keywords: onomatopoeia; animal sounds; dictionary entries; dictionary definitions; English dictionaries; synonyms

Manninen, Satu, and Maria Wiktorsson. 2025. '*Baa Baa Black Sheep*: Treatment of Words for Animal Sounds in Two Online English Dictionaries.' *Nordic Journal of English Studies* 24(1): 1–40. https://doi.org/10.35360/njes.v24i1.41113. Copyright (c) 2025 Satu Manninen, Maria Wiktorsson. This work is licensed under a Creative Commons Attribution 4.0 International License.

1. Introduction

Onomatopoeic words are a sub-type of iconic words where sounds of the word imitate sounds of the world: although ducks or sheep do not use actual speech sounds, the speech sounds that make up words like *quack* or *baa* are assumed to mimic how these animals sound. Onomatopoeic words are traditionally associated with sound, that is, sensory experience that is most salient and directly observable for humans; words for bodily sounds (*slurp*, *munch*), animal sounds (*quack*, *baa*, *moo*) and other natural sounds (*splash*, *thump*, *bang*) are commonly cited examples of such vocabulary. Although the sounds of ducks, sheep and raindrops falling from the sky are the same everywhere, speakers of different languages are argued to 'hear' and imitate them differently using language (e.g., Chamberlain 1892; Gombrich 1961; Werner and Kaplan 1963; Hinton, Nicholls and Ohala 1994; Cuskley, Simnet and Kirby 2015; Sidhu and Pexman 2018; Nuckolls 2020). A web search for *How does a rooster sound in different languages?* results in numerous hits listing words that differ considerably in terms of how they look and sound, and speakers of one language may have difficulty understanding how a rooster can possibly sound the way it sounds in languages other than their own. Previous work has shown that even onomatopoeias must fit the language's phoneme inventory and they seldom contain sounds or combinations of sounds that are not part of the language (Bredin 1996; Körtvélyessy 2020).

A topic that has received little attention in the past is how words for animal sounds are handled in dictionaries and if it is possible to identify consistent principles in the treatment of such words, both within and across dictionaries. In what ways are words depicting animal sounds linked with the animals that make these sounds? Are the links stated clearly in the entries, or are dictionary users expected to fill in such information for themselves? To date, little is known about the treatment of words for animal (and many other) sounds in dictionaries of English. Extensive lexicographic guides, handbooks and textbooks published during the past two decades, such as *The Oxford guide to practical lexicography* (Atkins and Rundell 2008), *Practical lexicography: A reader* (Fontenelle 2008), *The lexicography of English* (Béjoint 2010), *The Oxford handbook of lexicography* (Durkin 2016), *The Routledge handbook of lexicography* (Fuertes-Olivera 2017) and *The Bloomsbury handbook of lexicography* (Jackson 2022) do not address how onomatopoeic words are, or should be, handled in dictionaries of English. There is only isolated mention of topics

such as the possibility for online dictionaries to illustrate natural sounds using sound files. The same applies to articles in lexicographic journals, such as *The International Journal of Lexicography*. Sugahara (2010) partly addresses onomatopoeic words in the *Oxford English Dictionary*, but only investigates how the dictionary categorizes these words grammatically. The few sources where the treatment of words for sounds in dictionaries *is* discussed in more detail focus on languages like Estonian (Veldi 1999) and Czech (Kroupová, Štěpánková and Vodrážková 2018), and only occasional mention is made of English dictionaries. Some of this work is also focused on looking specifically at bilingual dictionaries (Veldi 1994).

The present paper will address this gap in knowledge and examine the entries of 36 English words for sounds produced by common animals, including dogs, cats, sheep, pigs, various birds, rodents and insects, in two monolingual English online dictionaries. The aim is to see how these words have been defined and exemplified in the dictionaries and if their treatment follows consistent identifiable lexicographic principles. Focusing on a relatively large number of words will allow us to determine if there is consistency in the dictionaries. Selecting fewer words but more dictionaries would have resulted in a different study, where the focus falls on determining if there is consistency *across* dictionaries in how words for animal sounds are dealt with. The first option is a more natural starting point, as comparing a number of dictionaries will make sense only after one has determined if there is consistency within the dictionaries.

All the 36 words included in the investigation come from two blog posts on the site *About words: A blog from Cambridge Dictionary* (About words 2022). The reason is that the author, a blogger for *Cambridge Dictionaries*, has already shown that the words can be used to depict common animal sounds in English, has named the relevant animals, and has provided definitions that can function as a baseline for the investigation of the dictionary entries. The first blog post, Woodford (2022a), covers the meanings of 13 words for sounds associated with dogs, cats and horses; the words are listed in Table 1, with Woodford's definitions and other comments. Woodford (2022b) discusses another 23 words, produced by other common animals: these are listed in Table 2.

Table 1: Animal sounds and their descriptions in Woodford (2022a)

Animal	**Sound**	**Definition and other comments in Woodford (2022a)**
dog	*bark*	'the usual loud, rough noise'
	yap	'high-pitched sound associated with smaller dogs, often used negatively'
	yelp	'sudden, short high sound associated with pain'
	growl	'continuous low threatening sound'
	snarl	'deep, rough sound with teeth exposed'
	whine	'long, high-pitched sound that shows the dog is unhappy or wants something'
dog / wolf	*howl*	'long, loud, high-pitched sound'
cat	*purr*	'quiet, continuous, soft sound'
	miaow (UK)	'high crying sound'
	meow (US)	'high crying sound'
	mew	'high crying sound'
horse	*neigh*	'long, loud, high call'
	whinny	'long, loud, high call'
	snort	'rather explosive sound of suddenly breathing out forcefully through the nose'

Table 2: Animal sounds and their descriptions in Woodford (2022b)

Animal	**Sound**	**Definition and other comments in Woodford (2022b)**
sheep, goat	*baa, bleat*	'sheep and goats are said to baa or to bleat'
cow	*moo*	'long, deep sound'
	bellow	'louder, distressed sound'
	low	'literary way of saying moo'
pig	*grunt*	'repeated low, rough noise'
	squeal	'longer, high-pitched sound'
bird	*tweet*	'short, high sound, pleasant'
	chirp	'short, high sound, pleasant'
	cheep	'short, high sound, pleasant'
	warble	'longer sound, with rapidly changing notes, pleasant'
	screech	'loud, high-pitched, unpleasant'
	squawk	'loud, high-pitched, unpleasant'
	hoot	'associated with owls'
	cluck	'associated with chickens'
	quack	'associated with ducks'
	honk	'loud, rough noise associated with geese'

	caw	'loud, rough noise associated with crows'
	coo	'repeated soft, low sound associated with doves and pigeons'
frog	*croak*	'characteristic deep, rough sound'
snake	*hiss*	'long *s* sound'
small rodents	*squeak*	'repeated short, high sound'
insects	*buzz*	'continuous, low sound'

We have followed the links from the blog posts to *Cambridge Dictionaries* (henceforth, *Cambridge*) and focused on the sources documenting British English usage. We have then looked up the words in another online dictionary, *The Merriam-Webster.com Dictionary* (henceforth, *Merriam-Webster*) where the focus has been on North American English. The following questions have served as a starting point:

1. Do the definitions of meaning state that the words depict animal sounds? Are the animals the same as in Woodford (2022a; 2022b)?
2. Are the animals named in the possible examples? Are the animals the same as in the definitions of meaning and/or in Woodford (2022a; 2022b)?

As the dictionaries represent different geographical variants, we can expect some variation in the animals listed as possible sources. The main reason for choosing these dictionaries is, however, that they are large, descriptive general-purpose dictionaries that aim to be representative of English vocabulary in its entirety. This means that we can reasonably expect items that mainly fall in informal and/or spoken language domains to be listed in these dictionaries. Both dictionaries are also produced by leading actors in the English dictionary market. *Merriam-Webster* characterizes itself as 'America's leading provider of language information' (About us, *Merriam-Webster* n.d.). *Cambridge* boasts its 'clear definitions' and is based on a dedicated corpus from which the examples in the dictionary are selected (English Dictionary, *Cambridge* n.d.). Both dictionaries are also listed among the most used online dictionaries of English in the world in sources such as Pikilniak et al. (2020). It should be noted that some modern online dictionaries add sound files to the entries that focus, among other things, on defining natural sounds such as the sounds of musical instruments, machines, and animals

as well as many human sounds such as claps and hiccups (Lew 2011; Jackson 2017). Such sound files are not used in *Cambridge* or *Merriam-Webster*, which means that this aspect will not be part of the investigation.

2. Dictionary entries and onomatopoeia

In its simplest form, a dictionary is an alphabetically arranged list of words in a language that are matched with a meaning. The meanings of words are communicated to dictionary users in the form of meaning explanations (Agerbo 2017) that include 'all the information in a dictionary entry that the lexicographer employs in order to transmit the meaning of an item to the dictionary user' (Atkins 2008, see also Béjoint 2010). This information can consist of the following elements:

- Information about lexical category
- Definition, in the sense of an explanation, description or paraphrase of the word's meaning
- Comments about usage, dialect, register, style
- Examples of synonyms and antonyms, in the sense of words that are semantically equivalent or opposite to the word
- Examples that show how the word can be used
- Cross-references to other words that may be of relevance

The noun *cat* is described as 'a small animal with fur, four legs, a tail, and claws, usually kept as a pet or for catching mice' (Cambridge n.d.) and as 'a small domestic animal known for catching mice' (Merriam-Webster n.d.). Both definitions provide a description of what a prototypical exemplar of the entity looks like, what it does or is used for, and what the superordinate category is. Descriptions of meaning are expected to use language and terms that are easily understandable, they should not be circular so a word's meaning is described in terms of itself, and all words and terms used to describe and paraphrase the meaning of a word should be entries in the same dictionary (Atkins and Rundell 2008; Béjoint 2010). It is widely known that items belonging to different word classes call for different definitions, and there is variation even within a single word class. Non-scalar adjectives, for example, are often explained in terms of negation and oppositeness, as establishing mutually exclusive categories is a fundamental property of such adjectives. Hence, *alive* is explained as

'having life: not dead or inanimate' (Merriam-Webster n.d.), while *dead* is explained as meaning 'deprived of life: no longer alive' (Merriam-Webster n.d.). Scalar adjectives are, in turn, explained in terms of synonyms and the domains where the adjectives fall. Both *big* and *small* are defined through references to the domain of size: *big* is paraphrased as 'large in size' (Merriam-Webster n.d.), *small* as 'having comparatively little size or slight dimensions' (Merriam-Webster n.d.).

A common denominator for words like *cat* is that there is no connection between their form—how the words look or sound like—and meaning. Onomatopoeic words, including words for animal sounds, are different, in the sense that their form is assumed to contribute to, and be part of, their meaning: the sounds of the word are assumed to mimic and iconically represent sounds of the world (e.g., Dingemanse 2012). Most previous work on dictionaries and dictionary entries of English words has focused on arbitrary words like *cat*, and little attention has been paid to the entries of descriptive, imitative words. The treatment of onomatopoeic words is discussed, in a handful of studies, for other languages. Veldi's (1999) paper is based on examples from Estonian and, to a limited extent, English. The author identifies various generic issues in the lexicographic description of onomatopoeic words, but does not conduct a *systematic* investigation of any specific words and/or dictionaries. Veldi observes that the meaning explanations in the entries of onomatopoeic words often consist of a description of the sound in question, of mentions of sources that make the sound, and of examples. Veldi (1999) stresses the importance of consistency in the descriptions of meaning and calls for clearer and more direct ways of providing information about the possible sources. Veldi also highlights the importance of providing examples that are explicit and focus on the most basic and concrete sound aspects of these words. Finally, the inclusion of synonyms in the meaning explanations is found to be problematic, as onomatopoeic words do not enter into synonymic relations in the same way as arbitrary words like *taxi* and *cab* do, and the topic needs to be researched more thoroughly, before synonyms can be of much help in a dictionary setting.

Kroupová, Štěpánková and Vodrážková (2018) investigate the descriptions of onomatopoeic words in *Akademický slovník současné češtiny* (*The academic dictionary of contemporary Czech*), which is a monolingual dictionary of Czech. The paper highlights the importance of including specific components in the meaning explanations more

consistently, most notably a description of the sound (how the sound 'sounds'). In line with Veldi (1999), they also argue that the entries should include more explicit information about typical sources for the sound. The authors state that onomatopoeic words need to be handled following their own set of rules, and that their treatment in general 'is rather insufficient in existing monolingual dictionaries' (Kroupová, Štěpánková and Vodrážková 2018).

Veldi (1999) and Kroupová, Štěpánková and Vodrážková (2018) agree that dictionary entries for most onomatopoeic words provide some type of description of the sound although there is variation as to how these descriptions look, and that there is also variation regarding if and how the source or producer is included. The source information can be direct, or it can function as part of an ostensive definition of comparison (Kroupová, Štěpánková and Vodrážková 2018). The definition of the verb *buzz* in *Cambridge* offers an example of this: 'to make a continuous, low sound such as the one a bee makes' (Cambridge n.d.). The explanation points indirectly to a source that makes such a sound, without stating *explicitly* that bees buzz.

3. Entries for words depicting animal sounds in Cambridge Dictionaries

The first step in the investigation has been to follow the links from the two blog posts to the relevant entries in *Cambridge*. The dictionary follows the common lexicographic practice of listing homonymous word forms as separate headwords; see Figure 1. Another common practice is to list nouns and verbs as separate headwords even when their meanings are related. This is shown in Figure 2, where we also see how the verb *bark* is viewed as polysemous: a single headword is followed by two different definitions of meaning.

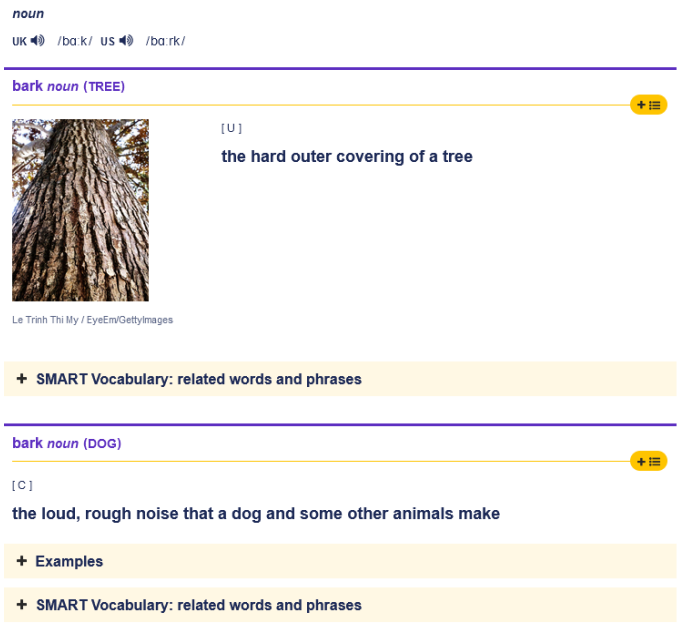


Figure 1: The definition section from the entry page for *bark* (noun) in *Cambridge*

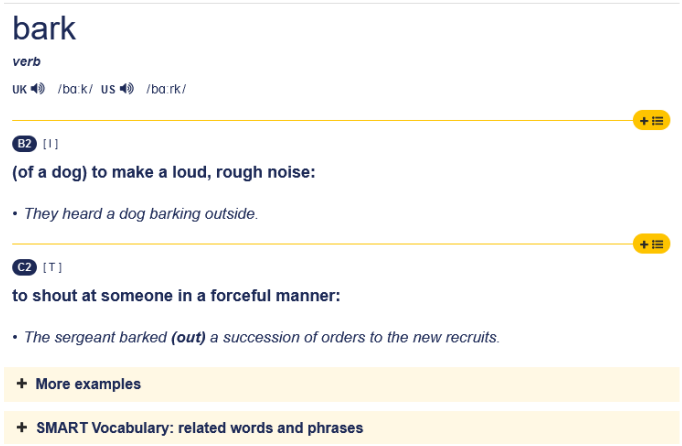


Figure 2: The definition section from the entry page for *bark* (verb) in *Cambridge*

Most entries for our words are similar to what we see in Figures 1 and 2, so the brief definitions of meaning, in boldface, precede most other

elements that are part of the entry. If any animals are mentioned, the information can precede the definition, as shown in Figure 2. The animals can also be named later—the more common option in this dictionary—as part of the sentence that defines the word's meaning or describes the sound in question; this is shown in Figure 1. Formulations like 'when animals such as frogs and crows croak, they make deep rough sounds' (*croak*, verb) are other common ways of naming the animals in these sentences. Another common formulation is to describe the meanings of verbs, for example *quack* and *moo*, along of the lines of 'to make the usual sound of a duck' and 'to make the deep, long sound of a cow'. While the relevant animals are named in these sentences, the sentences do not explicitly say *who or what* is making the sound of a duck or cow. In other words, it remains unclear if the word form is characterized as directly depicting an animal sound, or a sound that can be made by other sources as well and is only *imitative* of an animal sound. Similar observations have been made for dictionaries of other languages in Veldi (1999) and Kroupová, Štěpánková and Vodrážková (2018).

If the entry contains any examples, they can be placed immediately below the definition, so that each meaning that is identified for the word is accompanied by its own examples; see Figure 2. Examples can also come later, under headings that read *+Examples* (Figure 1) or *+More examples* (Figure 2).[1] Clicking on *+More examples* opens the list of examples shown in Figure 3. Although the verb *bark* is identified as having two separate senses, only one of them, in this case the animal one, is exemplified. It is not uncommon to find that some of the meanings are exemplified by more examples than others, and that some meanings are not exemplified at all.

[1] The panels that open under the heading *+SMART Vocabulary* 'provide words and phrases related to the one you've looked up' (Help, *Cambridge Dictionaries* n.d.). The items can be synonyms, enter in hierarchical relation, or belong to the same semantic field. In *Merriam-Webster*, similar lists are often provided under headings like *Synonyms*, *Antonyms* or *Synonyms and related words.* An analysis of these items is beyond the scope of this paper.

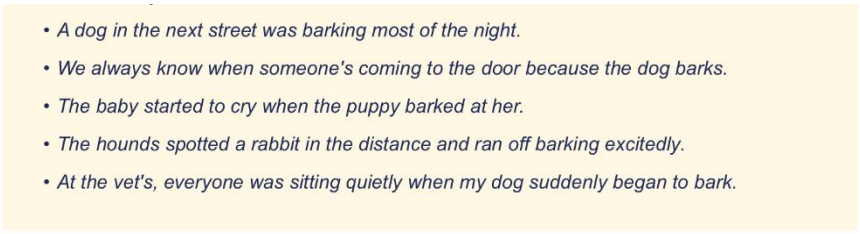


Figure 3: The *+More examples* section from the verb entry for *bark* in *Cambridge*

Table 3, which is placed in the Appendix due to its size, gives an overview of the results for the 13 words discussed in Woodford (2022a). The dictionary definition column shows if any of the definitions of meaning provided for the word names any animals, in any of the ways discussed above, and if these are the same as in the blog text. The example column reveals if any of the examples provided for the word mention any animals. *No* means that the entry contains examples where the word is used as a depiction of sound, but the sources are not animals. If the column is empty, there are no examples of such meanings.[2]

The first point to note, when looking at Table 3, is that the findings are in line with many of the observations made in dictionaries of other languages (Veldi 1999; Kroupová, Štěpánková and Vodrážková 2018; see also Sugahara 2010). Most of the 13 words have entries for both verb and noun use, and none of them are placed in any other word classes. Secondly, the entries deal with the words in a variety of ways, and there is no pattern that would predict what elements and information are provided in the entries. There are, for example, only two items in this set—*bark* and *yap*—where the definitions in both entries present the words explicitly as depictions of dog sounds and the examples exemplify the exact same readings. Another two words, *miaow* and *neigh*, also have definitions in both the verb and the noun entries where the words are treated as depictions of cat sounds and horse sounds, but only the verb entries have examples that exemplify these uses. None of the entries for *purr*, *whine* or

[2] Woodford (2022a) includes *miaow* and *meow* in the blog text. In *Cambridge*, the entry for *meow* only states that it is an American English spelling of *miaow*, and there is no other information. Likewise, the entry for *miaow* in *Merriam-Webster* states that it is a British English spelling of *meow*, and there is no other information. In the examination of *Cambridge* we have only included *miaow*, and in the examination of *Merriam*-Webster, only *meow*.

snort have definitions where the words would be presented as depictions of animal sounds at all. The first example of *purr* in each entry names cats, however, while the other examples name a lawnmower, a limousine, and an engine as sources of this sound. The same holds for *whine*, where one of the four examples in total mentions dogs. In the case of *snort*, the links with horses are indirect. The relevant definitions of meaning read 'to make an explosive sound by forcing air quickly up or down the nose' (verb entry) and 'a loud sound made by forcing air through the nose' (noun entry). All the examples of these readings name humans as the source: this is true also of the sentence *He did an impression of a horse snorting*, where dictionary users need to work out whether snorting is a sound of both humans and horses, or whether it is a sound of horses that humans can imitate.

For the remaining items in Table 3—*yelp*, *growl*, *snarl* and *howl*—the animals may be named in the entry for the noun, or for the verb, but not both. There is also variation as to where—in the definitions or the examples—the animals are mentioned. None of the definitions for the verb *yelp* is linked with any animals. The definition of the noun *yelp* mentions animals in general, without specifying dogs. Yet, one of the (four in total) examples in the *verb* entry names the yelper as a dog; all the other yelpers in both entries are humans. The definition of the verb *growl* does not name dogs (or any other animals) either, but the one in the noun entry does. Yet both these entries contain examples of dogs, although these are again outnumbered by examples where most growlers are humans. Finally, although only the verb entry for *snarl* presents the word as a depiction of dog sound—both entries contain examples where the snarlers are dogs—there are, again, more examples of humans who snarl.

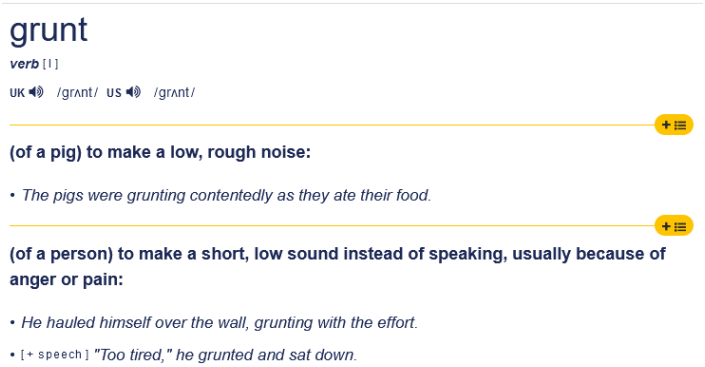
The overall results for the 23 onomatopoeic words in Woodford (2022b) are presented in Table 4 (see Appendix). The words are not placed in any other lexical categories than verbs and nouns and, as Table 4 shows, six items—*bleat*, *low*, *chirp*, *warble*, *cluck*, *coo*—have only verb entries in the dictionary. This is surprising, in view of what we have found for the first set. *No* and the empty columns are used in the same way as in Table 3. This time, there is only one item, *baa*, where the definitions in both entries present the word as a depiction of the natural sound of sheep and where this reading is also exemplified. For the six items that only have verb entries, the relevant animals are named explicitly in the definitions, but the entries have no examples that would exemplify these readings. For

eight words—*moo, bellow, tweet, cheep, hoot, quack, honk, caw*—both the verb and the noun entries contain definitions that name the same animals as Woodford (2022b) does, alongside various other natural and non-natural sources. There is more variation than in the previous set as to whether the animal sources are presented as separate senses of meaning—this is the case with *hoot*, where the verb entry has two separate definitions that read 'to make a short loud sound' and 'to make the sound that an owl makes'—or if the various sources are merged into one and the same sense, that is, are presented using the same description of meaning. This is the case with *honk*, where the definition of the verb reads 'If a goose or a car horn honks, it makes a short, loud sound', while the definition of the noun reads 'a short, loud sound made by a car horn or a goose'.

As in the previous set, the examples may or may not exemplify the animal readings. Neither entry for *hoot* contains examples of owls or other animals. In the case of *honk*, only the noun use is exemplified, with a single sentence where the honker is a horn. For *moo*, *tweet*, *cheep*, *quack* and *caw*, animal examples are provided in the verb entries only. All these examples are outnumbered by examples where the source is something else (usually a human being). For *bellow*, one example in the verb entry names bull and one example in the noun entry names cow, which is also the animal identified in Woodford (2022b). In all the remaining examples, the bellowers are humans.

Although we have seen how animals may be mentioned in only the noun definition of an item but exemplified in the verb entry, or vice versa, the animal mentions for all the items discussed above have been relatively direct. For the remaining items in this group—*grunt*, *squeal*, *screech*, *squawk*, *croak*, *hiss*, *squeak*, *buzz*—dictionary users will need to fill in information for themselves, before they are able to determine what readings—and what specific sources—the examples are meant to exemplify. The definitions of *squawk* in both entries characterize the word as a bird sound, and the examples specify the birds as chickens (verb entry) or owls (noun entry). Most dictionary users will, of course, already know that chickens and owls are types of birds, and the role of the examples is to provide more detailed information about what is said in the definitions. The examples serve a purpose because, although chickens and owls are not *prototypical* birds, they are still sufficiently well-known, to be recognized as entities that fall under the superordinate category *bird*. There are also cases where stating the superordinate category *animal* in (one of)

the definitions of meaning does not allow the dictionary users to decide what the intended source of the sound is. *Grunt* is associated with pigs in Woodford (2022b) and the link from the blog post leads to the entry in Figure 4. The two senses of meaning identified for the verb *grunt* are merged into a single sense in the noun entry, and the animal is no longer specified as a pig, but instead the superordinate category *animal* is mentioned; see Figure 5. If dictionary users *only* look at the definition and examples provided in the noun entry, they will need to already know what entities traditionally live in a pigsty and combine that knowledge with the mention of *animal* in the definition. However, in view of how even humans are mentioned as a possible source and the other example provided in the entry explicitly specifies the grunters as humans, the sentence featuring a pigsty is possible to be read as involving humans, too— it is not unheard of that human teenagers grunt and live in a pigsty. The animal reading will be foregrounded, if dictionary users have *also* read the definitions and looked at the examples in the *verb* entry of *grunt*. Similar observations can be made for the word *buzz.*


grunt

verb [I]

UK /grʌnt/ US /grʌnt/

(of a pig) to make a low, rough noise:

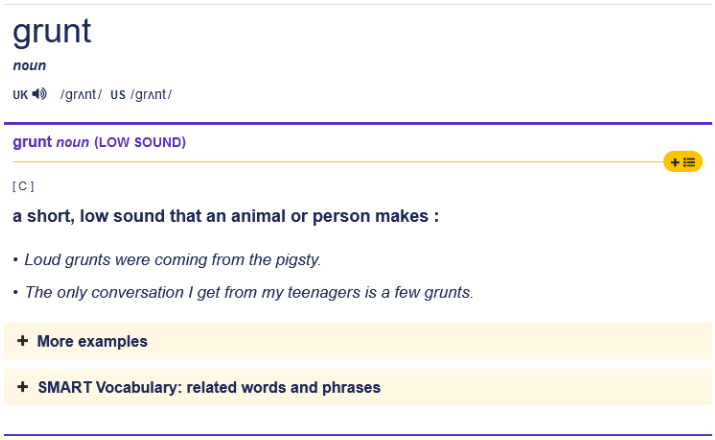
• *The pigs were grunting contentedly as they ate their food.*

(of a person) to make a short, low sound instead of speaking, usually because of anger or pain:

• *He hauled himself over the wall, grunting with the effort.*

• [+ speech] *"Too tired," he grunted and sat down.*

Figure 4: The definition section from the entry page for *grunt* (verb) in *Cambridge*


grunt

noun

UK /grʌnt/ US /grʌnt/

grunt *noun* **(LOW SOUND)**

[C]

a short, low sound that an animal or person makes :

- *Loud grunts were coming from the pigsty.*
- *The only conversation I get from my teenagers is a few grunts.*

+ More examples

+ SMART Vocabulary: related words and phrases

Figure 5: The definition section from the entry page for *grunt* (noun) in *Cambridge*

The definitions and examples of *squeal*, *screech*, *hiss* and *squeak* also require the dictionary user to fill in some gaps. As shown in Table 4, none of the definitions for these items specify them as possible depictions of animal sounds. The animals identified in Woodford (2022b) may or may not be named in the examples, alongside various other sources that outnumber the animal sources. One example in the verb entry for *squeal* names piglets, one names car brakes and one names humans, while in the noun entry, only car brakes and humans are specified. For *hiss*, one of the four examples in total mentions snakes, while in the other examples, hissing is attributed to (presumably hot) iron and humans. For *squeak*, one of the four examples provided names mice, a hyponym of rodents, which is the category identified in Woodford (2022b). The other squeakers are doors and humans. For *screech*, all the examples name humans and inanimate entities (cars, trucks) as sources for the sound. There is nothing in the entries that would allow dictionary users see that *screech* can *also* denote a ‘less positive word for unpleasant, loud and high-pitched bird sound’ (Woodford 2022b).

4. Entries for words depicting animal sounds in the Merriam-Webster.com Dictionary

In this section, we discuss the entries for the same 36 onomatopoeic words in *Merriam-Webster*. We start by commenting on how the entries can look, how the definitions can be formed, and how the examples are presented. Like in *Cambridge*, homonymous words are separate headwords. The same applies to verb and noun entries of words that are related. The different senses of polysemous words are usually listed under the same headword, and they are often numbered and/or lettered, along the lines of what we see in Figure 6.

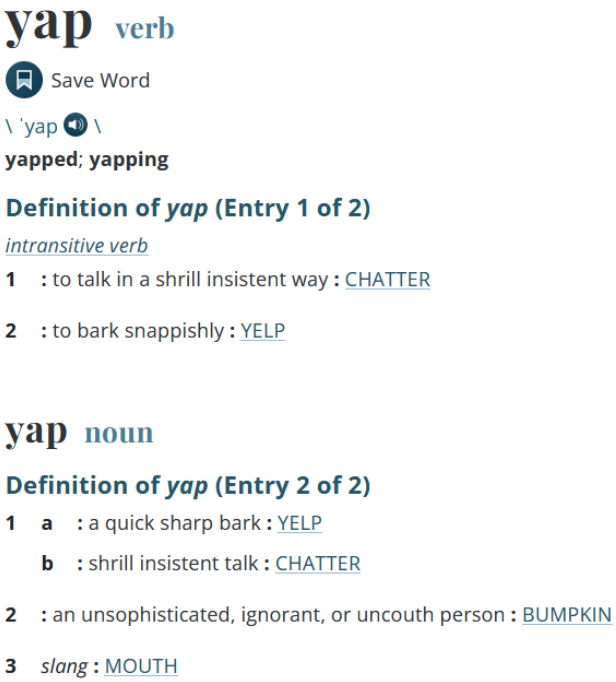


Figure 6. The definition section from the entry page for *yap* in *Merriam-Webster*

In terms of their general form, the definitions of meaning are often similar to what we see in Figure 6: they are seldom complete sentences. If any animal sources are mentioned, such mention is often formulated along the lines of ‘to make the prolonged cry of a horse’ (*neigh*) and ‘to make the

throat noise of a cow' (*moo*). These, like many of the formulations in *Cambridge,* leave room for interpretation as to whether the word depicts the sound of a horse, or a sound that only *imitates* the sound of a horse. Another general comment that can be made of the definitions in *Merriam-Webster* is that many of them are not actual *descriptions* of the sound: there is a difference between stating that *quack* and *honk* mean 'to make the characteristic cry of a duck' and 'to make the characteristic cry of a goose', respectively, and characterizing *warble* with the formulation 'to sing in a trilling manner or with many turns and variations'.

Some of the entries for the 36 words make use of what are labelled *synonymous cross-references* (Cross-references, *Merriam-Webster* n.d.) and are also shown in Figure 6. In such situations, the entry word and the cross-referred word are presented as being semantically equivalent: *yap* is defined as meaning *(to) bark snappishly* and as being synonymous to *yelp*. Although the use of synonymous cross-references can, in theory, be of help when defining a word's meaning, in practice the cross-references are not constrained enough, for our 36 words at least, to serve such a purpose. First, it is doubtful if *yap* and *yelp* in fact are synonyms—both Woodford (2022a) and *Cambridge* imply that *yap* lacks the associations of pain that are an important part of the meaning of *yelp,* and *yelp* is not a negative word, the way *yap* often is. Secondly, in view of how synonymy is often defined in terms of mutual entailment (e.g., Clark 1967; Cruse 1986) so that *The dog yapped* entails *The dog yelped* and vice versa, one would expect the synonymous cross-references to go consistently in both directions. Yet most entries for our words that have synonymous cross-references are like *yap* and *yelp,* in that word A may be marked as being synonymous to word B, but the entry for word B does not even mention word A. The problems with assuming that onomatopoeic words can be synonymous, with other onomatopes or with more 'ordinary' words, have also been raised in Veldi (1999).

A further problem with the synonymous cross-references for our words is that the entries cross-referred to may feature meanings that are contradictory to what is said in the original entry. A cat that makes 'a high crying sound' is said to 'miaow, meow, or mew' (Woodford 2022a). In *Merriam-Webster* the noun *mew,* as shown in Figure 7, is treated as a bird (a gull). This need not be a problem, as onomatopoeias can be associated with different animal sources in different geographical locations, and birds are known to be named after the sounds they make: *cuckoo* and *crow* are

further examples of this. What *is* problematic is that the entries labelled noun(1) and verb(1) in Figure 7 are formatted as if they were related (i.e., a case of polysemy), while the entry labelled noun(2) is separate from them (i.e., a case of homonymy). If it is true that noun(1) and verb(1) are related and noun(1) denotes a bird, then verb(1) cannot be defined using a synonymous cross-reference to a noun that means 'the cry of a cat'.

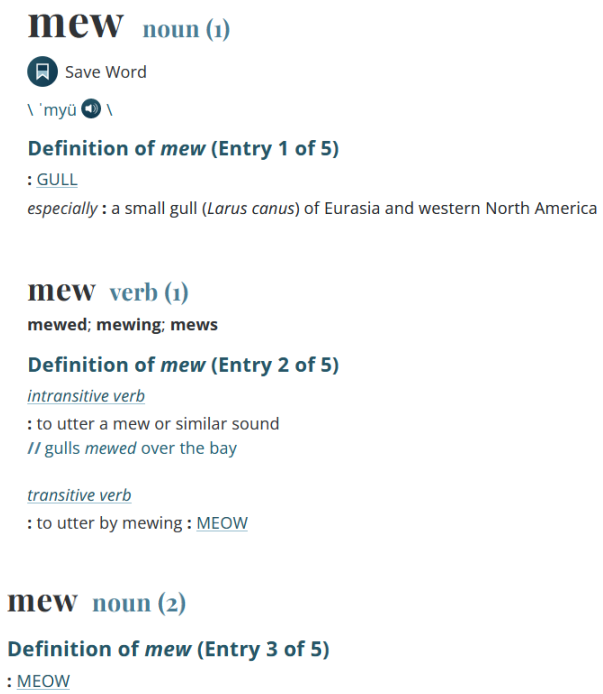


Figure 7. The definition section from the entry page for *mew* in *Merriam-Webster*

Figure 7 illustrates yet another recurring feature in the entries for the 36 words that should be commented on: the definitions of meaning, as already noted, tend to be rather brief, and they are often provided for only one of the entries—there is no consistency as to whether this is the verb or the noun entry—while the other entry contains a mere circular statement where the word is paraphrased in terms of itself. The nouns *bark* and *quack* are said to mean 'the sound made by a barking dog' and 'a noise made by

quacking', and the verbs *purr*, *chirp*, *grunt* and *cluck* mean 'to make a purr or a sound like a purr', 'to make a chirp or a sound resembling a chirp', 'to utter a grunt' and 'to make a cluck', to mention just a few more examples of this. Such statements make very little sense, unless dictionary users have also read other possible definitions of meaning provided for the word, which in many cases provide a more informative meaning explanation. These may come before or after the entry containing the circular statement.

As Tables 5 and 6 in the Appendix show, entries that only have definitions of meaning but no examples are not uncommon in *Merriam-Webster*. When the entry does contain examples, these may be listed in the verb entry, the noun entry or both. Examples can fall in three sub-types. One way of presenting examples is to list them immediately below the relevant definition of meaning, so that the examples illustrate that specific meaning only. As Tables 5 and 6 show, not all definitions that make references to animals are accompanied by such examples, and there are entries where none of the meanings is exemplified using such examples; Figure 6 illustrates a case in point. Examples can also come at the bottom of the page, so they follow all the entries where the word's meanings are defined. These examples can come under a heading that reads *Examples of [word] in a sentence*, or, a heading that reads *Recent examples from the web*, as shown in Figure 8. The examples listed under these headings can exemplify any of the meanings identified for the word, and they are not arranged in any identifiable order: their order does not mimic, for example, the order in which the word's meanings are presented in the entry. As in *Cambridge*, it is not possible to determine why some meanings are exemplified using more examples than others, and why some meanings are not exemplified at all.

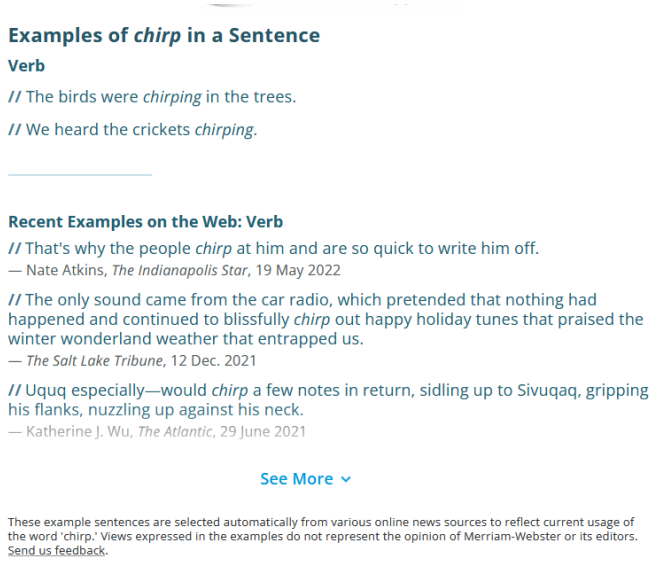
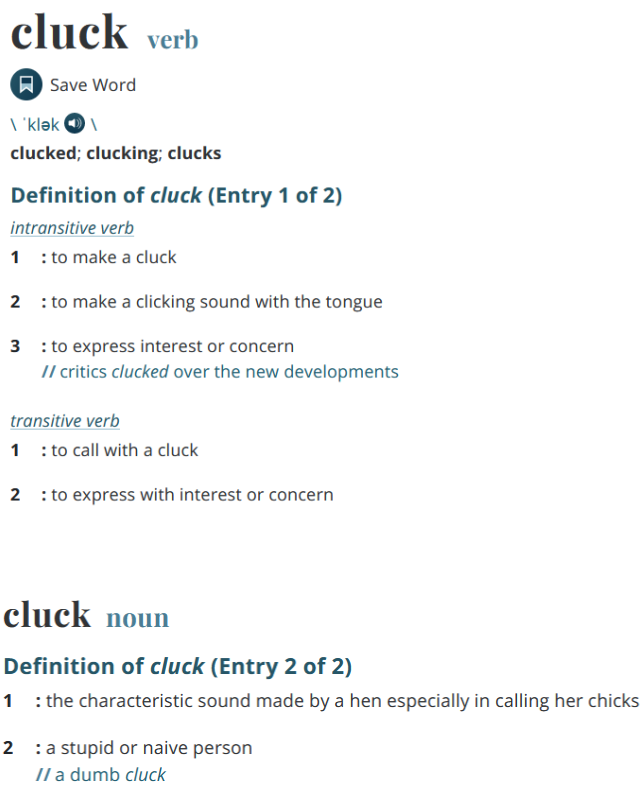


Figure 8. The example section from the entry page for *chirp* in *Merriam-Webster*

There is no information on the dictionary site explaining where the examples come from. The fact that most examples in the first sub-type are clearly linked to the meanings that they are paired with, and they help clarify these even further, suggests that they might be fabricated or selected from a corpus, for this specific purpose; see, e.g., Drysdale (1987) and Agerbo (2017) for the role of examples in dictionary entries. For the third sub-type, the web examples, the source is identified as 'various online news sources' and the examples are said to be 'selected automatically' and 'reflect current usage' of the word—this information is provided in the blurb that accompanies the web examples; see Figure 8. There is, however, no information anywhere on the dictionary site about the automatic selection process or the nature of the online news sources referred to. This is unfortunate, as dictionary users should be able to trust that the examples listed in the entries are accurate, reliable and match the definitions of meaning provided for the word. The role of examples should, after all, be to illustrate and clarify these meanings. The fact that the web is not a proper corpus, and that web searches using Google or some other search engine must be properly constrained, before they can result in reliable data, has been noted widely in previous work; see, e.g.,

Kilgarriff and Grefenstette (2003), Gatto (2014), Agerbo (2017) and Kilgarriff (2022). The varying quality of the web examples of our 36 words suggests that there is a need to re-consider why such examples are listed in *Merriam-Webster* in the first place, as 'bad' examples will only confuse the readers and lead them astray. Examples of the types of problems that the web materials generate for our 36 words include the observation that items listed under headings like *Recent examples on the web: noun* may not be nouns but verbs, while examples under the heading *Recent examples on the web: verb* may be nouns or adjectives. These are not isolated errors: four of the eight examples of *chirp* and seven of the eight examples of *croak* that are presented as examples of noun use are verbs, and six of the seven examples of *croak* are the same example repeated six times.

Another common problem with the web examples is that they cannot always be matched with any of the meanings that are identified for the word in the entries. The word *cluck*, as shown in Figure 9, can be used as a verb and a noun. Its meanings are described as being very concrete and as involving both animal and non-animal sources. Yet many of the web examples feature abstract extended readings and word-play, as in *Eating raw chicken can bring a cluck-load of other risks* and *Flat Rock has two chicken options, but with so many other food trucks dedicated to it, this isn't destination-worthy cluck for your buck*. In a dictionary context where the main function of examples is not to amuse, but to illustrate and clarify the meanings identified for the word, use of examples such as above cannot be viewed as a very successful policy.



cluck verb

Save Word

\ ˈklək \

clucked; **clucking**; **clucks**

Definition of *cluck* (Entry 1 of 2)

intransitive verb

1 : to make a cluck

2 : to make a clicking sound with the tongue

3 : to express interest or concern
// critics *clucked* over the new developments

transitive verb

1 : to call with a cluck

2 : to express with interest or concern

cluck noun

Definition of *cluck* (Entry 2 of 2)

1 : the characteristic sound made by a hen especially in calling her chicks

2 : a stupid or naive person
// a dumb *cluck*

Figure 9. The definition section from the entry page for *cluck* in *Merriam-Webster*

After these lengthy general remarks, we move to the overall results for the 13 words discussed in Woodford (2022a), presented in Table 5 (see Appendix). The dictionary definition column specifies if any of the definitions for the word name any animals, and if the animals are the same as in Woodford (2022a). This time, each sub-type of examples is placed in its own column. *No* signals that there are examples of this type, but none of them names animals. An empty cell signals that there are no examples of this type, or, in the case of the additional examples, the panel is not even there. As Table 5 shows, *howl* and *neigh* only have entries for verb use, *meow* for noun use. The 'missing' entries are not missing, but, as shown in Figure 10, are minimally informative. None of the 13 words in this set are placed in any other lexical categories than verbs and/or nouns.

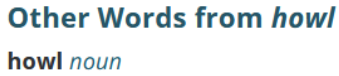


Figure 10. The definition section from the entry page for *howl* in *Merriam-Webster*

Bark is the only item in this set where the definitions in both entries present barking as a characteristic sound of dogs. There are no examples of this reading: all the examples feature humans that bark. In five cases—in the entries for *yap*, *growl*, *whine*, *snort* and *snarl*—neither the verb nor the noun entry has definitions of meaning where the items would be treated as depictions of animal sounds. Some of the examples of *yap*, *growl* and *whine* feature dogs, but these are outnumbered by examples of non-dog yappers, growlers or whiners. To illustrate how much more frequent the non-animal examples often are, one can look at the entries for *yap:* dogs are mentioned in three of the 20 examples provided in total. The non-animal yappers include humans (the most common type) and a gargoyle, or they are identified using personal names (*Poole*, *Green*) or pronouns (*they*, *some*), so the nature of the intended referents is unclear.

While some of the examples in entries for *yap*, *growl*, *whine* make explicit references to the relevant animals, the examples provided for the word *snort* are much less specific. The relevant definitions are shown in Figure 11.

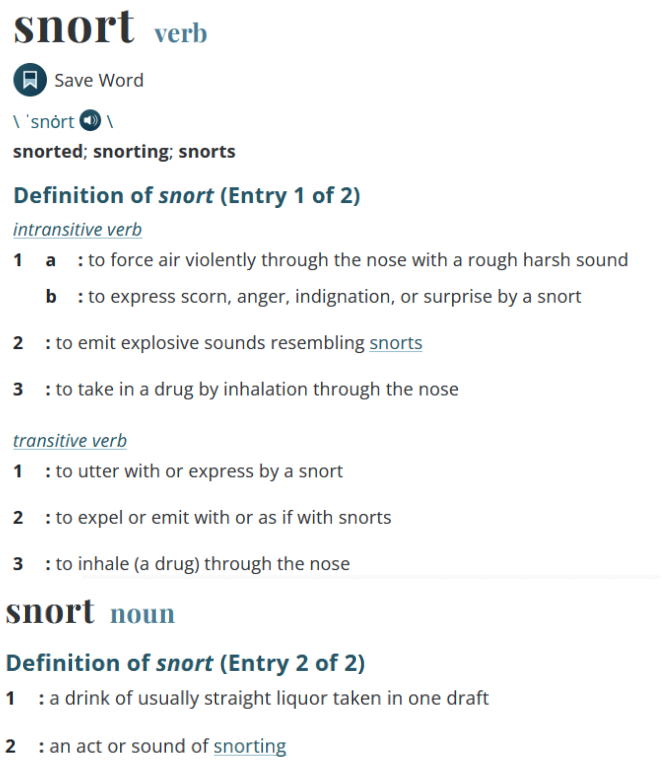


Figure 11. The definition section from the entry page for *snort* in *Merriam-Webster*

The examples listed under the heading *Examples of snort in a sentence* are shown in Figure 12. Rather than horses, which is the animal identified in Woodford (2022a), the only animals mentioned are pigs and a dog that snorts like a pig. The 16 web examples of *snort* that are also provided in the entry do not mention horses or any other animals. Most of the web examples exemplify, instead, situations where humans are consuming illegal substances. There is, then, nothing in the entries for this word that would help dictionary users see that snorting is *also* a characteristic sound of horses.

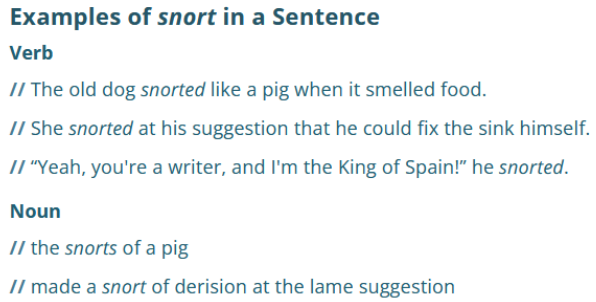


Figure 12. The example section from the entry page for *snort* in *Merriam-Webster*

The last item in this set, *snarl*, is defined by Woodford (2022a) as 'a sudden deep, rough sound from a dog, with the teeth exposed'. In *Merriam-Webster*, as shown in Figure 13, none of the definitions makes references to animals or specifies whose teeth are displayed. As there are no examples at all of how *snarl* can be used, dictionary users cannot identify the snarlers with the help of the examples either. The only clue that connects *snarl* with dogs is the word *growl* that is used in the definition of meaning. Dictionary users who already know that *growl* can be a dog sound, and dictionary users who look at the *examples* of *growl* in *Merriam-Webster*—dogs are featured only in the examples, but not in the definitions of meaning for *growl*—will be able to conclude that *snarl* can also be used to describe a dog sound.

snarl verb (2)

snarled; **snarling**; **snarls**

Definition of *snarl* (Entry 3 of 4)

intransitive verb

1 : to growl with a snapping, gnashing, or display of teeth

2 : to give vent to anger in surly language

transitive verb

: to utter or express with a snarl or by snarling

snarl noun (2)

Definition of *snarl* (Entry 4 of 4)

: a surly angry growl

Figure 13. The definition section from the entry page for *snarl* in *Merriam-Webster*

The overall results for the 23 words discussed in Woodford (2022b) are provided in Table 6 (see Appendix). The notations are the same as in Table 5. Six of the 23 items—*baa*, *moo*, *bellow*, *cheep*, *caw*, *coo*, *hiss*—lack the other (usually noun) member of the pair. *Hoot* is the only word that is also presented as an interjection, when it is 'used to express impatience, dissatisfaction, or objection'—this use is not relevant from an animal sound perspective. When a word has both a verb and a noun entry, the references to animals can be made in the verb entry, the noun entry, but seldom both, as Table 6 also shows. There is no consistency as to whether the references are made in the definitions of meaning, the examples, or both, although it is rather common, as Table 6 shows, to only mention the animals in the examples. There is also more variation than in the first group of words in how in/direct the references to animals are, and the animal examples are nearly always outnumbered by non-animal examples. The web examples stand out even here. As Table 6 shows, they may name more or different animals from the ones identified in Woodford (2022b) and/or in *Cambridge*. Although this is not a problem, it highlights an even further issue with the web examples. In linguistic literature, the term *basic-level category* is used to identify a level in a hierarchy that is viewed as being sufficiently specific, but not too specific, to represent the hierarchy

as a whole. The term that is used to refer to the basic-level category is also seen as having neutral, generic reference (e.g., Rosch and Mervis 1975; Rosch et al. 1976; Geeraerts 2000). The term can, therefore, serve as an informative answer to a question like *What did you see*? In a hierarchy that ranges from *living creature* > *animal* > *mammal* > *dog* > *labradoodle* > *Edgar*, the term *dog* will serve as the most informative response in most speakers' minds. In an out-of-the blue context, which is where dictionary examples necessarily fall, *I saw a dog* is also likely to serve as an informative statement. *I saw an animal* would be too broad, while *I saw a labradoodle* would be too specific, as it would require pre-existing knowledge about labradoodles being a type of dog. The examples that fall in the first two sub-types in *Merriam-Webster* mainly make use of category labels that are at the 'right' level from this viewpoint, including *dog*, *cat*, *horse*, *pig*, *goose*, *frog*, *mouse*. The web examples, in contrast, regularly make use of terms that are too specific for the task, which means that dictionary users may have problems matching the examples with the most appropriate (or, with any) meanings identified in the entries. Table 6 lists terms like *labradoodle*, *feral burro*, *manatee*, *cockatoo*, *pika* and *toucan* that are of this type, as they are only helpful for those dictionary users who are already knowledgeable about the animal world, or who *also* look up the meanings of these words in *Merriam-Webster*.

5. Concluding discussion

The investigation shows that neither of the dictionaries seems to follow an identifiable and internally consistent policy in their treatment of words for animal sounds. In *Cambridge*, 29 of the 36 words have both a verb and a noun entry. Of the 29 words, 14 are such that (i) the definitions of meaning present the words as depictions of animal sounds, (ii) the animals are specified clearly and unambiguously, and (iii) both entries present the same information. At the same time, only three of the 14 words are such that the animals are *also* named in the examples. This may be taken to suggest that, if the connections with animals are already explicitly stated in the definitions, the dictionary makers see no need to *also* provide this information in the examples, and the examples focus therefore on the other possible sources for the sounds that are often further extensions of the concrete animal and/or natural sound associations. For the remaining 15 words that have both a verb and a noun entry in *Cambridge*, seven are such that *none* of the definitions of meaning presents the words as depictions of

animal sounds. The relevant animals are usually named in the examples, but the animal examples are in all cases outnumbered by various non-animal examples. This means that it may be difficult for the dictionary user to conclude that the word they have looked up is *also* a depiction of a common animal sound in English, unless they already know this before they consult the dictionary.

Similar conclusions hold for *Merriam-Webster*, where 26 of the 36 words in total have both a verb and a noun entry. This time, only four of the 26 words are such that (i) the definitions of meaning present the words as depictions of animal sounds, (ii) the animals are specified clearly and unambiguously, and (iii) both entries present the same information. Furthermore, only one of these four words is also accompanied by examples that name the same animals. For the remaining 22 words that have both a verb and a noun entry in *Merriam-Webster*, 12 are such that *none* of the definitions of meaning presents the words as possible depictions of animal sounds. For 10 of these words, the examples provided in the entries may name animal sources for the sounds, alongside various non-animal sources. However, as there are issues with the type of examples provided in *Merriam-Webster*, the overall conclusion must be that dictionary users will find it difficult to understand, solely on the basis of the examples, that the words they have looked up are *also* depictions of common animal sounds in English. In other words, *Merriam-Webster* is relying heavily on the dictionary users already knowing this when they consult the dictionary.

Overall, the results show that there is a need to ensure that the descriptions of meaning provided for words for animal sounds include a proper description of what the sounds 'sound' like, and non-descriptive statements such as 'to make the usual sound of a duck' are avoided. There is also a need to avoid defining these words in terms of themselves, such as when the noun *quack* is said to mean 'the sound made by quacking'. In situations where the verb and noun uses of a word are defined along the lines of what we have just seen, the dictionary user is required to fill in information, based on their own experiences of the world, on what the usual sound of a duck indeed 'sounds' like. Is it hard? Is it rough? Is it loud? Is it a throat noise? As such information is provided for some of these words, one should be able to expect it consistently for all of them.

A further result is that the dictionaries lack a uniform policy on whether the animal readings are presented as separate senses of meaning,

or if the animal readings and 'other' readings, where the sound in question is caused by something else, are merged into one and the same sense. As it is often possible to distinguish between these readings, as shown by the fact that *The geese were honking and so was the horn of my Mercedes* reads as 'odd' as *I love you and meatballs*, there are reasons to keep the animal readings separate from the other possible readings. Speakers are also likely to activate different auditory imagery of honking in situations where the term is applied to geese and in situations where it is applied to a car horn. A related issue is the need to clarify explicitly and consistently if the word form is intended to signify an actual animal sound, or a sound that is only imitative of the sound that the animal makes—in other words, what is the word form presented as a description of?

Examples have an important role in clarifying a word's meaning in a dictionary, and the same applies to words for animal sounds. It is of utmost importance to ensure that the examples that are provided match the meanings identified for the word in a consistent and straightforward way and they do not involve unnecessary wordplay. The examples of animal readings should be given in the same entries where the senses of meaning involving animals are presented. Dictionary users should not have to consult various other entries, which may be for the same word or for some other word(s), to be able to piece together the whole story.

References

Agerbo, Heidi. 2017. Explaining meaning in lexicographical information tools. In *The Routledge handbook of lexicography*, edited by Pedro A. Fuertes-Olivera, 59–77. Abingdon: Routledge.

Atkins, Sue. 2008. Theoretical lexicography and its relation to dictionary-making. In *Practical lexicography: A reader*, edited by Thierry Fontenelle, 31–50. Oxford: Oxford University Press.

Atkins, B. T. Sue, and Michael Rundell. 2008. *The Oxford guide to practical lexicography*. Oxford: Oxford University Press.

Béjoint, Henri. 2010. *The lexicography of English: From origins to present*. Oxford: Oxford University Press.

Bredin, Hugh. 1996. Onomatopoeia as a figure and a linguistic principle. *New Literary History* 27(3): 555–569. http://dx.doi.org/10.1353/nlh.1996.0031.

Cambridge dictionaries. n.d. Accessed 15 June 2022. https://dictionary.cambridge.org/dictionary.

Cambridge dictionaries. n.d. Help. *Cambridge dictionary*. Accessed 10 August 2022. https://dictionary.cambridge.org/help.

Cambridge dictionaries. n.d. English Dictionary, *Cambridge dictionary*. Accessed 11 August 2023. https://dictionary.cambridge.org/dictionary/english.

Cambridge words. 2022. About Words. *Cambridge dictionary blog*. Accessed 10 August 2022. https://dictionaryblog.cambridge.org/.

Chamberlain, Alexander Francis. 1892. Some points in linguistic psychology. *The American Journal of Psychology* 5(1): 116–119. https://doi.org/10.2307/1410863.

Clark, Michael. 1967. The general notion of entailment. *The Philosophical Quarterly* 17(68): 231–245. https://doi.org/10.2307/2218157.

Cruse, Alan. 1986. *Lexical semantics.* Cambridge: Cambridge University Press.

Cruse, Alan. 2000. *Meaning in language: An introduction to semantics and pragmatics.* Oxford: Oxford University Press.

Cuskley, Christine, Julia Simner, and Simon Kirby. 2015. Phonological and orthographic influences in the bouba-kiki effect. *Psychological Research* 18: 119–130. http://dx.doi.org/10.1007/s00426-015-0709-2.

Dingemanse, Mark. 2012. Advances in the cross-linguistic study of ideophones. *Language and Linguistics Compass* 6(10): 654–672. http://dx.doi.org/10.1002/lnc3.361.

Drysdale, Paul D. 1987. The role of examples in a learner's dictionary. In *The dictionary and the language learner. Papers from the EURALEX seminar at the University of Leeds, 1–3 April 1985*, edited by Anthony Paul Cowie, 213–223. Berlin and Boston. Max Niemeyer Verlag. https://doi.org/10.1515/9783111340500-018.

Durkin, Philip (ed.). 2016. *The Oxford handbook of lexicography*. Oxford: Oxford University Press.

Fontenelle, Thierry (ed.). 2008. *Practical lexicography: A reader.* Oxford: Oxford University Press.

Fuertes-Olivera, Pedro A. (ed.). 2017. *The Routledge handbook of lexicography*. Abingdon: Routledge.

Gatto, Maristella. 2014. *The web as corpus. Theory and practice.* London: Bloomsbury.

Geeraerts, Dirk. 2000. Salience phenomena in the lexicon. A typology. In *Meaning and cognition*, edited by Liliana Albertazzi, 125–136. Amsterdam: John Benjamins.

Gombrich, Ernst Hans. 1961. *Art and illusion*. New York: Pantheon Books.

Hinton, Leanne, Johanna Nichols, and John J. Ohala (eds.). 1994. *Sound symbolism.* Cambridge: Cambridge University Press.

Jackson, Howard. 2017. English lexicography in the internet era. In *The Routledge handbook of lexicography*, edited by Pedro A. Fuertes-Olivera, 540–553. Abingdon: Routledge.

Jackson, Howard (ed.). 2022. *The Bloomsbury handbook of lexicography*. London: Bloomsbury.

Kilgarriff, Adam. 2022. Using corpora as data sources for dictionaries. In *The Bloomsbury handbook of lexicography*, edited by Howard Jackson, 71–88. London: Bloomsbury.

Kilgarriff, Adam, and Gregory Grefenstette. 2003. Introduction to the special issue on the web as corpus. *Computational Linguistics* 29(3): 333–347. https://doi.org/10.1162/089120103322711569.

Kroupová, Magdalena, Barbora Štěpánková, and Veronika Vodrážková. 2018. The sounds of a dictionary: Description of onomatopoeic words in the academic dictionary of contemporary Czech. In *The proceedings XVIII EURALEX international congress: Lexicography in global contexts*, edited by Jaka Čibej, Vojko Gorjanc, Iztok Kosem, and Simon Krek, 149–157. Ljubljana: Ljubljana University Press.

Körtvélyessy, Lívia. 2020. Onomatopoeia–A unique species? *Studia Linguistica* 74(2): 506–551. https://doi.org/10.1111/stul.12133.

Lew, Robert. 2011. Online Dictionaries of English In *e-Lexicography: the internet, digital initiatives and lexicography*, edited by by Pedro A. Fuertes-Olivera, and Henning Bergenholtz, 230–250. London: Continuum.

Merriam-Webster dictionary. n.d. Accessed 15 June 2022. https://www.merriam-webster.com.

Merriam-Webster. n.d. About Us. *Merriam-Webster*. Accessed 13 September 2022. https://www.merriam-webster.com/about-us.

Merriam-Webster. n.d. Cross-references, in Help. *Merriam-Webster*. Accessed 13 September 2022 https://www.merriam-webster.com/help/explanatory-notes/dict-cross-references.

Nuckolls, Janis. 2020. Onomatopoeia. In *The international encyclopedia of linguistic anthropology*, edited by James Stanlaw, 1–5. Hoboken, NJ: Wiley-Blackwell.

Pikilniak, Andrii, Nadia Stetsenko, Volodymyr Stetsenko, Tetiana Bondarenko, and Halyna Tkachuk. 2020. Comparative analysis of online dictionaries in the context of the digital transformation of education. In *Proceedings of the 8th workshop on cloud technologies in education* (CTE 2020), edited by Serhiy O. Semerikov, and Mariya P. Shyshkina, 70–81. ceur-ws.org. http://ceur-ws.org/Vol-2879/.

Rosch, Eleanor, and Carolyn B. Mervis. 1975. Family resemblances: Studies in the internal structure of categories. *Cognitive Psychology* 7(4): 573–605. https://doi.org/10.1016/0010-0285(75)90024-9.

Rosch, Eleanor, Carolyn B. Mervis, Wayne D. Gray, David M. Johnson, and Penny Boyes-Braem. 1976. Basic objects in natural categories. *Cognitive Psychology* 8(3): 382–439. https://doi.org/10.1016/0010-0285(76)90013-X.

Sidhu, David M., and Penny M. Pexman. 2018. Five mechanisms of sound symbolic association. *Psychonomic Bulletin & Review* 25: 1619–1643. http://dx.doi.org/10.3758/s13423-017-1361-1.

Sugahara, Takashi. 2010. Onomatopoeia in spoken and written English: Corpus- and usage-based analysis. PhD diss., Hokkaido University.

Veldi, Enn. 1994. Onomatopoeic words in bilingual dictionaries (with focus on English-Estonian and Estonian-English). *Dictionaries: Journal of the Dictionary Society of North America* 15(1): 74–85.

Veldi, Enn. 1999. *Lexicography of onomatopoetic words. Estonian: Typological studies III*. (Tartu Ülikooli Eesti keele õppetooli toimetised 11), edited by Mati Erelt, 204–230. Tartu: University of Tartu.

Werner, Heinz, and Bernard Kaplan. 1963. *Symbol formation*. New York: Wiley.

Woodford, Kate. 2022a. Howling, mewing and snorting (Animal sounds, part A). *About words - Cambridge dictionary blog*. 11 May. Accessed 8 June 2022. https://dictionaryblog.cambridge.org/2022/05/11/howling-mewing-and-snorting-animal-sounds-part-a/.

Woodford, Kate. 2022b. Grunting, lowing and bleating (Animal sounds, part B). *About words - Cambridge dictionary blog*. 25 May. Accessed 8 June 2022. https://dictionaryblog.cambridge.org/2022/05/25/grunting-lowing-and-bleating-animal-sounds-part-b/.

Appendix

Table 3: Animal sounds in Woodford (2022a) with the data from the *Cambridge Dictionaries*

Woodford	**Word**	**Dictionary definition names the (same) animal**	**Examples name the (same) animal**
dog	*bark*, V	Yes	Yes
	bark, N	Yes	Yes
	yap, V	Yes	Yes
	yap,N	Yes	Yes
	yelp, V	No	Yes
	yelp, N	Yes, but generic animal, not dog	Yes, but generic animal, not dog
	growl, V	No	Yes
	growl, N	Yes	Yes
	snarl, V	Yes	Yes
	snarl, N	No	Yes
	whine, V	No	Yes
	whine, N	No	No
dog/wolf	*howl*, V	Yes, both dog and wolf	Yes, both dog and wolf
	howl, N	No	Yes, but only dog
cat	*purr*, V	No	Yes
	purr, N	No	Yes
	miaow , V	Yes	Yes
	miaow, N	Yes	
	mew, V	Yes	
	mew, N	Yes	
horse	*neigh*, V	Yes	Yes
	neigh, N	Yes	
	whinny, V	Yes	Yes
	snort, V	No	Indirectly via human referents
	snort, N	No	No

Table 4. Animal sounds in Woodford (2022b) with the data from the *Cambridge Dictionaries*

Woodford	**Word**	**Dictionary definition names the (same) animal**	**Examples name the (same) animal**
sheep, goat	*baa*, V	Yes	Yes
	baa, N	Yes	Yes
	bleat, V	Yes	
cow	*moo*, V	Yes	Yes
	moo, N	Yes	
	low, V	Yes	
	bellow, V	Yes	Yes, but bull instead of cow
	bellow, N	Yes	Yes
pig	*grunt*, V	Yes	Yes
	grunt, N	Yes, generic animal	Only indirectly via *pigsty*
	squeal, V	No	Yes
	squeal, N	No	No
bird	*tweet*, V	Yes	Yes
	tweet, N	Yes	No
	chirp, V	Yes	
	cheep, V	Yes	Yes
	cheep, N	Yes	
	warble, V	Yes	
	screech, V	No	No
	screech, N	No	No
	squawk, V	Yes, generic bird	Yes, chickens
	squawk, N	Yes, generic bird	Yes, owls
owl	*hoot*, V	Yes	
	hoot, N	Yes	
chicken	*cluck*, V	Yes	
duck	*quack*, V	Yes	Yes
	quack, N	Yes	
goose	*honk*, V	Yes	
	honk, N	Yes	No
crow	*caw*, V	Yes	Yes
	caw, N	Yes	
dove, pigeon	*coo*, V	Yes	

Woodford	**Word**	**Dictionary definition names the (same) animal**	**Examples name the (same) animal**
frog	*croak*, V	Yes, frog and crow	
	croak, N	Yes, generic animal	
snake	*hiss*, V	No	Yes
	hiss, N	No	No
small rodents	*squeak*, V	No	Yes, mice
	squeak, N	No	No
insects	*buzz*, V	Yes, bee	Only indirectly
	buzz, N	No	No

Table 5. Animal sounds from Woodford (2022a) with the data from the *Merriam-Webster*

Wood-ford	**Word**	**Dict. def. names the (same) animal**	**Examples name the (same) animal**		
			Part of the entry	**Additional example sentences**	**Recent examples from the web**
dog	*bark*, V	Yes			
	bark, N	Yes			
	yap, V	No		Yes	Yes
	yap,N	No		Unclear	No
	yelp, V	No	Yes.	Yes	Yes, via naming a labradoodle
	yelp, N	Yes, also turkey			No, only turkey
	growl, V	No	Yes.	Yes	Yes, also seabird
	growl, N	No		Yes	No, only cub (species not specified) and elephant seal
	snarl, V	No			
	snarl, N	No			
	whine, V	No	No	Yes	Unclear
	whine, N	No		No	No
dog/ wolf	*howl*, V	Yes, via 'dog family'		Yes, also coyote	Yes, both dog and wolf. Also fox and specific breeds of dog (beagles, bloodhounds)
	howl, N	Not a real entry – only mentions that a noun also exists			
cat	*purr*, V	No	No	Yes	Yes
	purr, N	Yes		No	No
	meow, V	Not a real entry – only mentions that a verb also exists			
	meow, N	Yes			Yes

Wood -ford	**Word**	**Dict. def. names the (same) animal**	**Examples name the (same) animal**		
			Part of the entry	**Additional example sentences**	**Recent examples from the web**
cat	*mew*, V	Yes, but only indir-ectly	Yes, but gull, not cat		
	mew, N	Yes, but gull, not cat			
horse	*neigh*, V	Yes		Yes	Yes
	neigh, N	Not real entry – only mentions that a noun also exists			
	whinny, V	No		Yes	Yes, but mare instead of horse; also mention of generic animal life
	whinny, N	Yes			Yes
	snort, V	No		No, only dog that snorts like a pig	No
	snort, N	No		No	No

Table 6. Animal sounds from Woodford (2022b) with the data from the *Merriam-Webster*

Wood-ford	**Word**	**Dict. def. names the (same) animal**	**Examples name the (same) animal**		
			Part of the entry	**Additional example sentences**	**Recent examples from the web**
sheep, goat	*baa*, V	Yes, but only sheep			Yes, but only generic animal and unclear examples
	baa, N	Not a real entry – only mention that a noun also exists			
	bleat, V	Yes, both sheep and goat		Yes	Yes, but only goat and buck
	bleat, N	Yes, both sheep and goat		No	Yes, but only sheep. Also fawn
cow	*moo*, V	Yes			Yes
	moo, N	Not a real entry – only mention that a noun also exists			
	low, V	No	Yes		
	low, N	Yes			
	bellow, V	Yes	No	No	No, only alligator
	bellow, N	Not a real entry – only mention that a noun also exists			
pig	*grunt*, V	No		No	No, only camel
	grunt, N	Yes, but hog, not pig. Also 'Haemulidae synonym Pomadasyidae'	No	Yes	No
	squeal, V	No	No	No	Yes
	squeal, N	No		Yes	Yes, but generic animal, not pig
bird	*tweet*, V	No	Yes		No
	tweet, N	No			No

Wood-ford	**Word**	**Dict. def. names the (same) animal**	**Examples name the (same) animal**		
			Part of the entry	**Additional example sentences**	**Recent examples from the web**
bird	*chirp*, V	No	Yes, also grass-hopper	Yes. Also cricket	Yes, bird
	chirp, N	Yes, also insect			Yes, also cricket, frog, manatee
	cheep, V	No		No	Yes, duckling and fake eggs
	cheep, N	Not a real entry – only mention that a noun also exists			
	warble, V	No		Yes	
	warble, N	No			
	screech, V	No	No	No	No
	screech, N	No		No	Yes. Also gulls and the species ‘screech owl’
	squawk, V	No	No	No	Yes, spec. gull
	squawk, N	No		No	Yes, spec. seabird, cockatoo, toucan
owl	*hoot*, V	Yes	No	Yes	No
	hoot, N	Yes	No	No	No
chicken	*cluck*, V	No	No	Yes	Yes
	cluck, N	Yes, but hen not chicken	No	No	Yes, but only generic bird
duck	*quack*, V	Yes			
	quack, N	No			
goose	*honk*, V	Yes		Yes	No
	honk, N	Yes		No	Yes, also feral burro

Wood-ford	**Word**	**Dict. def. names the (same) animal**	**Examples name the (same) animal**		
			Part of the entry	**Additional example sentences**	**Recent examples from the web**
crow	*caw*, V	Yes, crow			Yes, but only generic bird. Also raven, seagull
	caw, N	Not a real entry – only mention that a noun also exists			
dove, pigeon	*coo*, V	Yes, pigeon	No	No	No
	coo, N	Not a real entry – only mention that a noun also exists			
frog	*croak*, V	No		Yes.	Yes, also raven and rooster
	croak, N	No			Yes. also amphibian
snake	*hiss*, V	No	No	No	Yes, also swan and ‘wide-eyed critters’
	hiss, N	Not a real entry – only mention that a noun also exists			
small rodents	*squeak*, V	No	No	Yes, mouse	Yes, pika and manatee
	squeak, N	No	No	No	No
insects	*buzz*, V	Yes, bees	No	Yes, flies	No
	buzz, N	No	No	Yes, bees	No