Shouting and Screaming: Manner and Noise Verbs in Communication

Margaret Urban and Josef Ruppenhofer
University of California, Berkeley, CA, USA

Abstract

When a noise verb is used to indicate verbal communication, factors from both the source domain of the verb (perception) and the target domain (communication) play a role in determining the argument structure of the sentence. While the target domain supplies a syntactic structure, the source domain's semantics constrain the degree to which that syntactic structure can be exploited. This can be determined by comparing noise verbs in this use with manner-of-communication verbs, which are superficially similar, but native to communication. Data for these two classes of verbs were drawn from the British National Corpus. The data were annotated with frame-semantic markup, as described in the Berkeley FrameNet Project. We compared the presence, type of syntactic realization, and position of the semantically annotated arguments for both classes of verbs. We found that noise and manner verbs show statistically significant differences in these three areas. For instance, noise verbs are more focused on the form of the message than manner verbs: noise verbs appear more frequently with a quoted message. In addition, there are differences other than the complementation patterns: certain noise verbs are biased with respect to speakers' genders, message types, and even orthography in quoted messages.

1 Introduction

Correspondence:
Margaret Urban,
2079 Delaware No. 27,
Berkeley, CA 94709-2210, USA.
E-mail:
murban@socrates.berkeley.edu

1 Except as indicated the numbered examples (see note b)in this paper are from the British National Corpus, or BNC.
See info.ox.ac.uk/bnc

In many languages, words can be used in different domains from those in which they originated. In English, noise verbs are commonly used in the context of human communication:[1]

'Shut up, Doreen,' Silas *barked*, his face contorted by a scowl.

'Darling,' Conrad *cooed* as Lee entered the living room.

'He's a thief, Hilary,' he *grated* almost savagely.

Grandson Richard *rumbled* a reply.

However, the syntactic patterns of noise verbs used for communication are not the same as those found with true communication verbs. More-over, not all noise verbs have communication uses; the ones that do are

restricted as to the type of message and/or speaker they can occur with. Several researchers (Miller and Johnson-Laird, 1976; Levin, 1991, 1993; Goossens, 1995; Levin et al., 1997; to name a few) have explored these phenomena, paying particular attention to which noise verbs have or lack communication uses, but without discussion of how these senses come to exist. Here we propose a unified and expanded corpus-based account of these cross-domain extensions in terms of Frame Semantics (Fillmore, 1982). This analysis has implications for the further description of relationships between frames (e.g. inheritance and blending), and the diachronic development of cross-domain uses of words. In what follows, we will attempt to motivate these facts about noise verbs.

2 Research Context

The theoretical context of this research is Fillmore's *Frame Semantics*, according to which lexical meaning provides structure for or constrains syntactic realization. The arguments licensed by a verb, called *Frame Elements* (FEs), reflect the participants in the real-world situation or *frame* evoked by the verb. Thus senses of a verb are understood in terms of the frames in which they participate and the patterns of arguments which appear with them. For example, in the domain of motion, there exists a frame *Self-motion*, in which 'a living being moves under its own power in a directed fashion, i.e. along what could be described as a path' (Johnson et al., 2001, p. 159). This frame includes verbs such as *clamber, crawl, hike, hobble, scamper, troop, wade,* and *walk*. The moving being is identified as the Frame Element Self-mover, and other possible FEs include Source, Path, Goal, and Distance:[2]

[Her mother$_{Self-mover}$] was already *clambering*[laboriously$_{Manner}$] [down$_{Path}$][from the seat beside the driver$_{Source}$], displaying a lumpy mass of grey woollen stocking and woollen knickers in the process.

Next [he$_{Self-mover}$] *hiked* [40 km$_{Distance}$] [due North$_{Path}$] and arrived back at his base camp.

Then [he$_{Self-mover}$] *waded* [through the banked snow$_{Path}$] [to the foot of the wall$_{Goal}$].

The FrameNet Project[3] is creating a lexical database with three linked components: lexical descriptions, a frame database, and annotated example sentences (Baker et al., 1998). The source corpus, the BNC, contains part-of-speech tagged sentences. Files that represent senses of lexical items within a particular domain and frame (represented as *domain/frame*) are created, and constituents are annotated with the FEs that are realized with respect to the target word. This annotation, along with automatic markup of phrase type and grammatical function of the FE constituents, is further analysed for the combinations of syntactic and semantic patterns realized in various senses. Even while still in progress, this project has become a valuable resource for lexical and other linguistic analysis.

2 In the example sentences in this paper, square brackets surround the FrameNet-annotated constituent, subscripts name the FE, and italic identifies the target word of each sentence.

3 Principal Investigator (PI) Charles J. Fillmore; this project, housed at the International Computer Science Institute in Berkeley, California, has been funded by the NSF (NSF IRI-9618838, 'Tools for Lexicon Building'). See www.icsi.berkeley. edu/~framenet.

2.1 The perception/noise frame

By noise verbs we mean those verbs that participate in a frame whose basic meaning is to denote the production of some sound. It is true these verbs can also appear in communication uses, as shown above, and in motion uses as in the following:

> In the morning a little aeroplane came *buzzing* across the blue window-pane of sky and alighted on the sugary beach.

> Ten minutes late, the overcrowded 6.20 a.m. express *rumbled* past Clapham Junction.

However, they are generally considered to be basic to the noise production sense (Levin, 1991, 1993; Levin *et al.*, 1997; amongst others). The perception/noise frame, which incorporates noises made by animals and by inanimate objects, includes *bark, bellow, chirp, grunt, moo, peep, rasp, thunder*, and *yelp*. In the FrameNet sense, these verbs are found in the domain of perception and the frame noise (represented as perception/noise). FrameNet has created lexical entries for 193 verbs in perception/noise. This frame is, in a sense, defined by the arguments that appear in it:

> A physical entity (Source) emits a sound, or two or more entities coming into contact with one another (Source-1 and Source-2) create a sound . . . Manner expressions may be relevant in this frame, if they describe properties of the sound as such (Johnson *et al.*, 2001, p. 171).

The principal FEs found in perception/noise therefore include Source, Source-1, Source-2, Cause, Sound, and Manner. In their home domain, noise verbs are usually intransitive, taking the sound Source as subject:

> Somewhere behind her [a horn$_{Source}$] *blared*.

> The ducks began quacking and [the frogs$_{Source}$] *croaking*.

Manner expressions typically elaborate the type or quality of sound but do not conflict with the inherent meaning of the verb:

> [Heavy boots$_{Source}$] *clattered* [suddenly$_{Manner}$] outside and Jack Dodson panted his way through the door.

> [A horse$_{Source}$] skidded on ice, *whinnying* [loudly$_{Manner}$] as it fell to its side.

> [He$_{Source}$] *yelped* [shrilly$_{Manner}$] and dropped his guard just sufficiently for a sword, swung by a surprised opponent, to skewer him.

2.2 Communication and the communication/manner frame

The frames in the domain of communication[4] are defined as having 'to do with verbal communication between people' (Johnson *et al.*, 2001,

4 FrameNet's communication frames are candidness, commitment, conversation, encoding, gesture, manner, noise, questioning, request, response, statement, and volubility. -

p. 108). Therefore, the verbs in these frames license the FEs Speaker, Addressee, Message, Topic, and Medium. Communication verbs are often transitive, with a Speaker subject and an Message object. Addressee and Topic phrases and Manner adverbs also appear:

> In 1926 [Thomas Hardy$_{Speaker}$] *remarked* [forlornly$_{Manner}$] [of contemporary modernist writing$_{Topic}$]: ['They've changed everything now.'$_{Message}$]

> [The seller$_{Speaker}$] *informed* [the buyer$_{Addressee}$] [in writing$_{Medium}$] [that, if he did not pay the balance by a given date, the seller would try to re-sell the cars$_{Message}$].

One frame of communication is *communication/manner*, which involves verbs that inherently indicate manner of speaking (e.g. *drawl, mouth, mutter, shout, stammer, whisper*). FrameNet has created lexical entries for twenty-three verbs in communication/manner. Examples are as follows:

> ['How's the shop?'$_{Message}$] *mumbles* [one balding sweating man$_{Speaker}$] [to another$_{Addressee}$].

> One of his body squires heard [him$_{Speaker}$] *whispering* [about it$_{Topic}$] [to his Gascon favourite$_{Addressee}$].

> 'If [you$_{Speaker}$] so much as *whisper* [a word$_{Message}$] [about Dame Agatha$_{Topic}$] [to the Lady Maeve$_{Addressee}$], you will regret the day I ever plucked you out of Newgate!'

> [Kirsty$_{Speaker}$] *chattered* [excitedly$_{Manner}$] throughout the journey, helping to keep Shiona's mind off her anxieties.

3 What Makes a Noise Verb a Good Communication Verb?

Words denoting the production of non-linguistic sound are found in the perception/noise frame. Human verbal communication (in the vocal sense) necessarily involves the production and perception of sound. The class of sounds that can be used to describe human speech as well as non-linguistic sound is roughly delimited by the following two criteria. First, the sound is preferably produced by an animate being (e.g. *bark, yelp*) rather than an inanimate object (e.g. *clack, thud*). In fact, in the FrameNet word lists, the set of animal noise verbs that can be used for human communication is three times as large as the set of inanimate noise verbs that can be used in this way. Secondly, if the sound is an animal sound, it cannot be an imitative signature sound (e.g. **She oinked/woofed her goodbye*). In other words, the verb cannot pre-specify the exact shape of the acoustic signal. If the noise is associated with inanimate objects, it needs to have an extended temporal profile and to be reproducible by the human vocal tract (**He clinked with glee*).

4 Noise Verbs in Communication

The frame in which noise verbs are used for communication is called *communication/noise*. Given that sounds are most directly relevant for characterizing the acoustic shape of an utterance, rather than the Addressee, the Topic, or the Content, our first expectation is that, of all the frames of communication verbs, communication/noise verbs will be most similar to communication/manner verbs.

However, the communication/noise verbs (e.g. *scream, bellow*) do not behave in the same way as genuine manner of speech verbs (e.g. *shout, whisper*), differing from them both syntactically and semantically. As Levin *et al.* (1997) point out, noise verbs are not native to the domain of communication. We argue that the differences in their behaviour in communication arise from differences between the structures of the perception/noise frame and the communication domain. Perception/noise contains a Source and optionally an inanimate Cause or animate Causer, and a Sound. A sound is imagined as emanating from a source without being directed at anything or anybody in particular; the noise production frame gives no consideration to potential perceivers. Consequently, noise verbs are typically intransitive, with fewer required and optional arguments. On the other hand, communication verbs are typically transitive and can take prepositional-phrase adjuncts, because the frame invokes more participants, most often Messages or Addressees. Given these differences, our second expectation is that communication uses of noise verbs will have properties distinct from those of primary communication verbs.

4.1 Method

The syntactic and semantic differences between sentences in communication/manner and communication/noise can be exemplified statistically by the analysis of complementation patterns and frequencies in proportional samples of representative verbs from each domain and frame. We examined the presence of Messages, the phrase types that appear as Messages, the presence and type of Addressee phrases, the presence of Manner phrases, and the presence of Topic elements.

The authors, both researchers involved in all stages of the FrameNet Project, have examined annotated files for 193 verbs in perception/noise, twenty-three verbs in communication/manner, and sixty verbs in communication/noise (there are 314 communication verb files overall). For comparison purposes, we determined precise statistics for eleven communication/noise verbs, eight communication/manner verbs, and one communication/statement verb (*say*), based on randomly selected data. Statistical significance was determined by χ^2 tests of the factors under discussion. These are listed in tables with the raw numbers used to calculate them, and compare whether the differences in Manner and Noise results are significant, with a level of confidence of 95. In the tables, cv stands for critical value.

4.2 Message presence and type

We found that although both communication/manner and communication/noise have a high percentage of Messages, there is a significantly higher percentage for communication/noise. This may reflect the inheritance of multiple Message phrase types into communication/noise (Table 1).

We categorized Messages into four types: quoted, nominal, clausal, and other (including to-infinitives, as-phrases, prepositional phrases, etc.) (Table 2). The complementation pattern seems to be weighted toward physical message form, in that quoted Messages are the commonest Message type in both communication/manner and communication/ noise. Moreover, proportionally more quoted Messages are found with noise verbs than with manner of speech verbs, indicating that a communication/noise sentence emphasizes physical Message form even more. On the other hand, communication/manner verbs tend to have a higher proportion of clausal Messages.

Table 1 Message presence (numbers, with percentages given in parentheses)

	Message		No Message	
Manner	1174	(85.51)	199	(14.49)
Noise	941	(92.80)	73	(7.20)

χ^2 value = 31.21; cv 3.84.

Table 2 Message types (numbers, with percentages given in parentheses)

	Quoted		NP		Clausal		Other	
Manner	917	(78.11)	197	(16.78)	34	(2.90)	26	(2.21)
Noise	777	(82.57)	97	(10.31)	12	(1.28)	55	(5.84)

χ^2 value = 40.89 > cv 7.82

4.3 Message placement

Unlike nominal and clausal Messages, quoted Messages have the option of appearing in three positions: they can precede, follow, or be split around the target word:

'Well, well, well,' he *drawled*. (Preceding)

Hess *yelled*: 'Soon we turn to Russia.' (Following)

'I'll do it,' he *bellowed*, 'anytime I feel like doin' it!' (Split)

The 'Preceding' position is generally the beginning of the sentence; given the prominence of such a position, a Message placed there is emphasized even more. Both communication/manner and communication/noise have approximately 75 per cent Preceding Messages and about 18 per cent Following, and the remaining amount is Split around the verb.

4.4 Addressee presence and types

Some communication verbs, most in the frame statement (*address, advise, inform, tell*) invoke an Addressee, which is the direct object of the target word, as in the following:

'But [I$_{Speaker}$] can *assure* [them$_{Addressee}$] [our umpires will be quite even-handed about checking all bowlers$_{Message}$].'

Doctors should be advised, [they$_{Speaker}$] must *inform* [patients$_{Addressee}$] [about side effects and dangers$_{Topic}$].

However, in both communication/manner and communication/ noise, Addressees are realized as the noun objects of prepositional phrases. An overall comparison of the proportion of sentences reveals that the two frames behave similarly with respect to the presence of Addressees, i.e. the comparison is not significant (Table 3).

What is interestingly different about the two frames is the preposition that introduces the Addressee-phrase. The canonical preposition for communication-domain Addressees is *to*. The participant identified by this preposition is voluntarily part of the speech situation. The majority of Addressees in communication/manner is introduced with *to*-type prepositions (which include *to, into, in*):

['Too mean to offer a living wage,'$_{Message}$] *muttered* [Tom Tedder$_{Speaker}$] [to the young man beside him$_{Addressee}$].

['Are you sure you're OK, Connie?'$_{Message}$] [he$_{Speaker}$] *whispered* [to Connon$_{Addressee}$] as the others went ahead through the door.

With noise verbs used in communication, Addressees can be introduced in the same way:

['What the hell are you doing?'$_{Message}$] [she$_{Speaker}$] *screamed* [to the unseen driver$_{Addressee}$] as the black vehicle came hurtling towards her once more . . .

['Hang on,'$_{Message}$] [he$_{Speaker}$] *grunted* [to Antony$_{Addressee}$] and clambered quickly to the top.

But the Addressees of noise verbs can also be realized by a prepositional phase headed by *at* (*at*-PP):

['It's too late,'$_{Message}$] [she$_{Speaker}$] *screams* [at her daughter$_{Addressee}$], to which Elaine cries, 'Not for me.'

Table 3 Addressee presence (numbers, with percentages given in parentheses)

	Addressee		No addressee	
Manner	155	(11.29)	1,218	(88.71)
Noise	141	(13.61)	895	(86.39)

χ^2 value = 3.08 < cv 3.84.

[Sarah$_{Speaker}$] *screamed* [at him$_{Addressee}$], ['No, I bloody well won't, you gormless eejit!'$_{Message}$]

['You're right,'$_{Message}$] [he$_{Speaker}$] *bellowed* [at Benjamin$_{Addressee}$].

In fact, the corpus shows that this type of coding is actually the normal strategy used with noise verbs in the communication domain. Communication/noise verbs overwhelmingly invoke *at*-type prepositions to introduce their Addressees. Table 4 shows the numbers and percentages of types of Addressees, comparing those introduced with *to*-type prepositions and those introduced with *at*-type prepositions (*at, after, before*) for Manner and Noise verbs.

Table 4 Addressee type (numbers, with percentages given in parentheses)

	To-type addressee		*At*-type addressee	
Manner	101	(65.16)	54	(34.84)
Noise	33	(24.09)	104	(75.91)

x^2 value = 49.84 > cv 3.84.

We suggest that there is a special distinction in the encoding of Addressees. *At* introduces the direction of a motion event, whereas *to* introduces the goal or recipient:

Moe threw a pie at Curly.

Moe threw a pie to Larry.

In the communication domain, *to* usually introduces a voluntary participant in the speech situation, and *at* simply the direction of speech. When noise-type encoding is used for Addressees of communication/noise as in the three *at*-PP examples above, there is an implication that the Addressee is not a voluntary participant. It should be noted that, as Table 4 (above) also shows, speakers can and frequently do use manner verbs more like noise verbs to achieve the same result. This is done by using *at* for the encoding of the Addressee.

['I'll deal with you later,'$_{Message}$] [Otley$_{Speaker}$] *muttered* [at me$_{Addressee}$].

['Stupid,'$_{Message}$] *mouthed* [Caspar$_{Speaker}$] [at Fenella$_{Addressee}$] under cover of the serving of half a dozen roast boars.

When there is an *at*-phrase Addressee but no Message, a manner verb can look even more like a noise verb:

[I$_{Speaker}$] *shouted* [at it$_{Addressee}$] [in English$_{Medium}$] but it kept on.

[One of the passengers, an American,$_{Speaker}$] stood up and *shouted* [at her$_{Addressee}$].

4.5 Manner presence

Manner expressions can elaborate on the manner of some action, even if the verb denoting the action itself describes the manner, or introduce a component of manner not found in the verb. In communication/noise

and communication/manner this means that Manner expressions elaborate on the production of the utterance, as in:

Instead [he$_{Speaker}$] *whispered* [hoarsely$_{Manner}$], ['Gently, gently.'$_{Message}$]

or on the emotional state of the Speaker, as in:

['Waal,'$_{Message}$] [he$_{Speaker}$] *drawled* [defiantly$_{Manner}$], ['let it come out.'$_{Message}$]

Both frames have a small but significant percentage of Manner expressions; however, proportionally more Manner expressions are found in communication/manner sentences than in communication/noise sentences (Table 5).

Among the Manner expressions appearing with both verb classes, expressions referring to emotional states are three times as common as production-related expressions. As Table 6 shows, however, the two classes do not differ significantly with respect to the distribution of the two types.

4.6 Topic presence

Topic elements appear in a very small percentage of both communication/manner and communication/noise sentences. Again, this is in accord with the analysis suggested above, that these frames profile the manner and quality of direct speech and are less concerned with Topic and Content. Of course, information about these components can usually be derived from the Message. However, there is even a significant difference of Topic presence between the two frames. Noise verbs contain even fewer Topics than Manner, as Table 7 shows.

Table 5 Manner presence (numbers, with percentages given in parentheses)

	Manner		No manner	
Manner	154	(11.22)	1,219	(88.78)
Noise	68	(6.71)	946	(93.29)

χ^2 value = 13.75; cv 3.84.

Table 6 Manner types (numbers, with percentages given in parentheses)

	Emotion		Production	
Manner	109	(70.78)	45	(29.22)
Noise	53	(77.94)	15	(22.06)

χ^2 value = 0.97 < cv 3.84.

Table 7 Topic presence (numbers, with percentages given in parentheses)

	Topic		No topic	
Manner	29	(2.11)	1,344	(97.89)
Noise	5	(0.49)	1,009	(99.51)

χ^2 value = 9.98 > cv 3.84.

4.7 Argument patterns

The cluster of FEs that appear in a sentence with respect to a target word is called the *Frame Element Group*, or *FEG*. The frequencies of various FEGs show the subcategorization tendencies of target words. Combinations of FEs may be possible given the frame descriptions that are never found in the data. In our data, for instance, there are no examples of sentences with both Medium and Topic. Of the thirty-four sentences that contain Topic elements, twenty-two sentences (64.71 per cent) occur without a Message, as in:

[The housekeeper$_{Speaker}$] left the room, *muttering* [about ingratitude$_{Topic}$].

The ten most frequent patterns in both manner and noise verbs make up 75.87 per cent of the sentences in our dataset. Of these patterns, eight contain two or fewer realized frame elements—the Speaker and the Message. In the entire dataset, there are 1,809 sentences with only two realized FEs, which represents 75.79 per cent. This once again shows that other possible elements of communication are not highlighted in these frames (Table 8).[5]

At the other end of the scale, there are only thirteen occurrences of sentences with four realized FEs, which represents 0.54 per cent of the data. Of these, nine occur with manner verbs. This may be another example of 'inheritance' of the syntactic structure of communication (Table 9).

5 Explanations

It is clear not only that noise verbs are not native to the domain of communication, but also that they participate easily in expressions about communication. Although, as mentioned above, researchers have generally discussed the phenomenon without necessarily attempting to provide an explanation, some proposals have been put forth that merit discussion.

Table 8 The ten most frequent Frame Element Groups

Frame	Spk	Add	Msg	Med	Top	Man	Plc	No. of S	No. of FEs
Mnr	S		Gq				P	589	2
Nse	S		Gq				P	500	2
Mnr	S		Gn					136	2
Mnr	S		Gq				F	126	2
Mnr	S							103	1
Nse	S		Gq				F	99	2
Mnr	S		Gq			M	P	85	3
Nse	S		Gn					78	2
Nse	S		Gq				S	49	2
Nse	S		Gq			M	P	46	3

Number of sentences in top ten patterns is 1811; number of sentences in dataset is 2,387.

5 Explanations for abbreviations in this and all other tables can be found in Table A3.

Table 9 Frame Element Groups with four Frame Elements

Frame	Spk	Add	Msg	Med	Top	Man	Plc	No. of S	No. of FEs
Mnr	S	Ain	Gq			M	P	2	4
Mnr	S	Aat	Gq			M	P	1	4
Mnr	S	Ato			T	M		1	4
Mnr	S	Ato	Gn			M		1	4
Mnr	S	Ato	Gq			M	S	1	4
Mnr	S	Ato	Gq			M	F	1	4
Nse	S	Aat	Gn	D				1	4
Nse	S	Aat	Go			M		1	4
Nse	S	Aat	Gq	D			P	1	4
Nse	S	Aat	Gt			M	P	1	4
Nse	S	Ato	Gq			M	F	1	4
Nse	S	Ato	Gs	D				1	4

Number of sentences with four FEs is thirteen; number of sentences in dataset is 2,387.

5.1 Sense subordination

Levin (1991, p. 214) states that the process by which these extensions are made ' "subordinates" the meaning of the verb associated with the basic sense under an additional component of meaning to give the extended sense'. Levin also suggests that in sentences such as 'He groaned his displeasure' there is a separate verb sense of the type 'express (an emotion) by emitting the sound'.

This characterization, however, seems much too general and inexplicit to us. It provides no systematic information about how the syntactic and semantic characteristics of the two elements will interact; nothing is said about the fact that the noise verbs resulting from the process of subordination do not exhibit the same behaviour as manner of communication verbs.

The subordination account seems incorrect in portraying the composition of the communication-senses as the result of merely plugging in a sound element into a larger meaning, rather than casting it as a kind of reconciliation procedure. For instance, it cannot be predicted that *yodel* has a communication use where a real verbal message can be specified. Objectively, *yodelling* involves repetition of some string such as *holladiriadei*, and should therefore lack a communication use in the way that imitative animal sound words such as *oink* lack communication uses. Yet this is not the case. If pitch and intonation alone are taken as characteristic of yodelling, which is not the case in normal yodelling, then it can have a communication construal.

Similarly, we argue that taking a narrower profile of the verbal scene allows some components, for instance, the multiple source participants in an inanimate noise verb such as *grate* or *rasp*, to be reconstrued as a single source in uses such as ' "Mind what I said, now, girlie", he *grated* in a raucous roar that turned all heads'. Without the possibility of such a construal, according to the above quote from Levin *et al.*, it would not be possible for inanimate two-participant noise verbs to be used in communication senses, where a single speaker produces the sounds internally.

In addition, the subordination model does not predict which sounds

are expressive of which emotions. Although there is often a correspond-ence between how certain sounds are used by animals and people, e.g. in the case of *snarling*, the match-up is by no means predictable from the noise verb alone. For instance, in human communication, *rasp* is used in contexts of dissatisfaction: 'Ye wouldn't listen to me, would ye!' he *rasped*. This conventional association with dissatisfaction cannot, how-ever, have an equivalent emotional state in the case of a Source that is an inanimate object or objects. Therefore, empirical work is necessary to fully describe the meaning of the use of noise verbs in the communica-tion domain.

5.2 Metaphor and metaphtonymy

Goossens (1995) argues that communication uses of noise verbs are of three different types. The first one is *metonymic*. For instance, one can interpret the following sentence in such a way that the speaker giggles in the middle of her utterance, between the words 'Oh lovely' and 'it's getting so hot already!'

'Oh lovely,' Mary *giggled* with delight, 'it's getting so hot already!'

Another interpretation that this sentence has is what Goossens calls the *metaphtonymic* one. Metaphtonymy is metaphor from metonymy. The speaking scene described is not necessarily perceived as involving any actual giggling. Rather, the speaking sounds *as if* the speaker were giggl-ing.

The last kind of use is the purely *metaphorical* one in which there is no metonymy involved. For instance, in a sentence with *bark* or *purr*, it is very unlikely that the speaker actually gives a bark or purr in the middle of an utterance and then continues to speak, in particular because the noises involved are animal noises that people do not make naturally:

'Control yourself, you silly witch,' he *barked* at her.

Similarly, communication sentences with inanimate noises such as *rasp* or *grate* are not understood as involving metonymy:

'What makes you think that would be the case?' he *rasped* irritably.

We agree with Goossens that metonymy plays a central role in the understanding of such sentences as the above three examples. In fact, we would like to suggest that metonymy may be the only mechanism needed to characterize all three kinds of sentence and that not even the animal or inanimate noise verbs are examples of metaphor as it is traditionally understood. There are several arguments to be made for such a view. First, in the case of noise verbs being used in the communication domain, both domains involved are concrete rather than one being concrete and the other being abstract. Secondly, the domains are not discrete; verbal communication necessarily involves the production of sounds/noises. Thirdly, and most importantly, when one takes into consideration the larger set of non-native verbs that can be used in the communication

Table 10 Other quote-introducing verbs

Argumentation	allow, concede, contradict, counter, insist, object, persist, protest, pursue, undermine
Turntaking	add, amend, blurt, continue, contribute, ejaculate, improvise, interject, interpose, interrupt, intersperse, intervene, proceed, prompt, resume, return, salute, start, supply, volunteer
Physical state of speaker	blush, breathe, bristle, burp, choke, gasp, pant, salivate, shudder, sigh, squirm, weep
Social effect	accuse, admire, adore, approve, chide, decide, exhort, instruct, judge, mock, promise, rule, scold, swear, threaten
Quality of message/evidence	conclude, diagnose, divine, guess, hazard, hesitate, joke, know, lie, mumble, muse, ponder, reminisce, risk, speculate, venture, whisper
Emotion	agonize, bark, beam, blaze, effuse enthuse, explode, falter, flute, frown, fulminate, fume, grate, grin, laugh, nod, panic, pout, puff, shrug, smile, smirk, spit, storm, swoon, trumpet
Other	grovel, translate
Emission	froth, gush, ooze, spew

domain (more specifically as quote introducers), it becomes evident that their use is not motivated by conceptualization of the communication domain in terms of some other domain (Table 10).

For instance, in a sentence such as the following, speaking is in no clear sense conceptualized as an event with an aspectual structure involving a beginning, a middle, and an end:

'Supposing we do get separated . . .' Daniel *started*.

One does not understand more about the communication event by learning that it is not continuous but has a beginning. What is going on is just that the speaking event as such is metonymically referred to by its position in the discourse. Similarly, in the following sentence, communication is not conceptualized in terms of truthfulness:

'There was a hole in it,' *lied* Nessie.

The speaker of the sentence simply conveys, in addition to reporting the fact and content of the reported speech, that they consider that speech to be untruthful. We suggest that noise verbs such as *bark* and *rasp*, when used in the communication domain, similarly highlight an additional parallel dimension of the communicative situation, rather than offering a new conceptualization of that situation itself. In addition to reporting the fact of speech, they convey that a particular acoustic and a particular emotional quality characterize the event.

5.3 Frames and constructions

The layered structure of the meaning of communication/noise verbs can be captured in the Construction Grammar framework. According to Goldberg (1995, p. 5), 'simple clause constructions are associated directly

with semantic structures which reflect scenes basic to human experience'. Linguistic communication is basic to human experience. We propose that there is a grammaticalized construction of communication, and that certain noise verbs as a class are permitted to enter into this construction. The semantics of the verb (and its class) and the semantics of the construction must interact to create the meaning of the final expression.

Croft (1991, p. 160) formulates the 'Causal Relation Hypothesis' (CRH) to explain how constructions and verb classes interact. The CRH states that the integration must occur 'via a (temporally contiguous) causal relationship'. In communication/noise sentences the production of some noise and the communication event are simultaneous, and the noise causes the communication to occur. Although Croft's explanation works for communication/noise verbs, a wider conception of the action is needed for other verb classes and constructions. Goldberg (1995, pp. 61–5) extends Croft's criteria for 'conflation patterns'. She shows, for instance, that non-motion verbs imported into the *Way* construction ('The main reception foyer was almost empty but Ford nevertheless weaved his way through it') can indicate the *manner* of motion. The first two example sentences in Section 2.1 include noise verbs imported into a more general motion construction. To account for such cases Goldberg suggests that 'the semantics associated with the construction defines a semantic frame, and the verb must inherently designate a particular salient aspect of that frame'.

When verbs participate in constructions, the final expression must integrate the roles of the verb with the arguments of the construction. Some roles fuse with a constructional argument; here, for instance, the sound Source from the perception/noise domain fuses with the Speaker of the communication domain. The Sound fuses with the Message. The construction has roles with no counterparts in the perception/noise domain (Addressee, Topic, Medium); therefore the final expression is allowed variability in their realization. For instance, communication/noise verbs show fewer Topics and Mediums. The evidence of pattern differences arises in these cases, where perception/noise and communication/manner have elements which do not correspond.

6 The Subtle Difference Between *Shouting* and *Screaming*

So far we have argued on the basis of the presence and the realization of frame elements that there are small but significant differences between manner and noise verbs in the communication domain. The differences between the two verb classes are, however, not limited to complementation patterns. Special properties of noise verbs in the communication domain can even be observed below the level of FEGs, which argue for maintaining a difference between the two in communication contexts.

6.1 Standing alone

The verbs shout and scream both denote human vocal activity. How is

one to know in the first place that scream is 'really' a noise verb rather than a manner of speaking verb or some underspecified kind of verb? In decontextualized uses, the manner verbs in the following still imply verbal communication[6]:

Larry suddenly *shouted*. (manner verbs)

Larry suddenly *whispered*.

whereas the noise verbs in the following do not:

Moe suddenly *screamed*. (noise verbs)

Moe suddenly *grunted*.

Similarly, in situations in which sound is produced as a reaction to, and is indicative of the experience of an emotional or physical state, noise verbs are acceptable but manner verbs are not:

Moe *screamed* in pain. (noise verbs)

Curly *groaned* in disgust.

*Moe *shouted* in pain. (manner verbs)

*Curly *muttered* with relief.

The noun versions of these verbs behave the same way; in these reaction contexts verbs implying verbalization are not welcome:

Larry gave a *sigh* of relief. (noise noun)

*Larry gave a *mutter* of relief. (manner noun)

6.2 Communication/noise constraints

Noise verbs tend to have much stronger associations with speaker and message characteristics than manner verbs. For instance, it is very often the case that the type and nature of elements that appear as arguments to communication/noise verbs are conventionalized, and conventionalized in ways reflective of facts about the perception/noise frame. Any kind of speaker can speak in a particular articulatory manner (*whisper*, *chant*, *drawl*) but not every speaker can felicitously speak in a particular noise (*chirp*, *twitter*, *squeak*).

6.2.1 *Guys Mannering: noise and gender*

One of the most important and easily observed characteristics for speakers is gender. Men (her father, His Serene Highness Prince Bernhard of Saxe-Weimar, the Emperor, the relieved Prince, the Doctor, the overseer, the sergeant, Graeme Souness)[7] are more likely to *grate*, *grunt*, or *bellow* than are women:

We passed the police sentry, who *grunted* a sleepy greeting.

'Who are you?' *bellowed* Pumfrey, in his most parade-ground voice.

By comparison, women (Mary, Annabelle, one of the Leicester ladies,

6 Examples in Section 6.1 are not from the BNC.
7 Gender identification on non-specific nouns (doctor, sergeant) was through related possessives and similar clues elsewhere in the sentence.

Table 11 Speaker's gender for selected manner and noise verbs (numbers, with percentages given in parentheses)

	Lemma	Male		Female	
Manner verbs	mumble	107	(60.5)	70	(39.5)
	mutter	126	(66.0)	65	(34.0)
	whisper	84	(49.8)	108	(50.2)
Noise verbs	bellow	161	(86.6)	25	(13.4)
	grate	103	(95.4)	5	(4.6)
	scream	23	(41.1)	33	(58.9)
	cluck	2	(25)	6	(75)

Mildred, Miriam Bernstein) are much more typical *squeakers* and *twitterers*:

'And if we did get out, what would we do?' *squeaked* Lollo, my sister.

'My time, my time, children,' Miss Bingham *twittered* feebly, flashing her teeth.

Although manner verbs such as mutter also can show an imbalance between the genders, the difference is on average much more pronounced with noise verbs. Table 11 shows, for a selection of noise and manner verbs, the numbers (and percentages) of identifiable male and female speakers.

No doubt the characteristics of the particular noise must be reproducible by the type of person making the utterance, i.e. women produce high-frequency noises, men low-frequency. But there are other speaker characteristics associated with noise verbs that are less obviously linked to the acoustic signal. These include age (e.g. *cackle*) and social status or authority (e.g. *bellow*):

'I'll warrant he is!' the old lady *cackled* unexpectedly.

'Well, don't just stand there gaping,' *bellowed* the Headmaster.

6.2.2 Mixed messages: message types

Noise and manner verbs also differ in that the former have strong preferences for certain message types. Consider the range of noun phrase message complements found with *bellow* and *mutter*:

(1) Things people mutter: doubts about the stability of the fairy-tale marriage; a prayer; something; something incoherent; goodbye; loving words; an apology; gruff compliments; a particularly earthy curse; the occasional curse (from BNC).

(2) Things people bellow: abuse; the order; orders; his own orders; the command; instructions; their lines; the song; the Battle Hymn of the Republic; his nanny impersonation; his name; his words; something; his disbelief; the profanities; frantic warning (from BNC).

Whereas *mutter* can occur with emotionally positive (loving words), neutral (something), and negative messages (curse), *bellow* preferably

occurs in command (order, command) and performance (song, their lines) contexts.

The corpus examples show us that older people and females are better *cacklers* and *chirpers*; men and people in authority can *rumble, bellow*, and *grunt* more felicitously. Similar constraints operate for elements that appear indicating Manner, and even for the content of quoted Messages. Thus, *grunt* does not occur with the Manner expression *seductively*; it is also highly unlikely that it would occur with the Message 'I love you, dear'.

6.2.3 Orthographic expression

In written texts, quoted Messages can, in addition, express their 'manner' via punctuation, using question marks, exclamation points, commas, and dashes. Thus they are able to exemplify 'phonetic' representations of dialect, personal style, and speech patterns that are the result of an emotional state (anger, nervousness):

['What about me leg?'$_{\text{Message}}$] *howled* [Tiptoe$_{\text{Speaker}}$].

['You know why we 'ave to do tortoises,'$_{\text{Message}}$] [the centurion$_{\text{Speaker}}$] bawled.

['Th-that's b-blackmail,'$_{\text{Message}}$] [she$_{\text{Speaker}}$] spluttered.

Her teeth almost rattled from the onslaught as [she$_{\text{Speaker}}$ stammered, ['I—I'm sorry—it—it's just a habit I've got into of—of coupling you together—'$_{\text{Message}}$].

6.2.4 Complications

Although the averages for noise and manner verbs overall show significant differences, the comparison of specific collocated pairs such as shout and scream shows fewer clear distinctions. There is a set of verbs (including *babble, burble, chant, chatter, gabble, gibber, holler, jabber, mumble, murmur, mutter, scream, shout*, and *yell*) that as a class describe noises made by humans with their vocal cords, but that include verbs both with and without linguistic content. Both types involve the use of the vocal cords, which defines their membership in this class. Because of this overlap, a metonymy based on physical experience, these verbs 'visit' easily in each other's domains, complicating statistical analysis. For instance, in our data, the manner verb *shout* has more Addressees introduced with *at*-type prepositions than with *to*-type, giving it a sort of honorary noise verb status. This will also be based on the expected characteristics of the particular verb: *shout* requires a loud noise, making it an unsuitable verb for a dinner-table tête-à-tête, and more likely to behave like a verb of noise production. The subcategorization patterns for what might originally have been distinct senses intertwine and overlap. There are atoms of lexical information in our intuitions: babies *babble*, but don't *mumble*.[8] Brooks *murmur* (which may be metaphorical) but don't *mutter*. There are pairs that collocate, having similar but not synonymous meanings: *shout* and *scream, mutter* and *murmur, rant* and *rave*. However, a survey analysis cannot tease apart the meanings at that level of granularity.

8 The authors are grateful to Charles J. Fillmore for suggesting this example.

7 Conclusions

This analysis shows that in these cross-domain uses, semantic and syntactic factors from both source and target domains play a role in determining the structure of the utterance. The target domain supplies a syntactic structure, here a grammaticalized construction in the domain of communication. Thus, much of the syntax of communication/noise resembles that of communication/manner. However, the source domain's semantics constrains the degree to which that syntactic structure can be exploited, hence the variance between realizations of arguments in communication/manner and communication/noise. The synthesis of linguistic theory, lexicography, and work with large-scale corpora is necessary for significant coverage of the data. The frame semantic approach, with detailed lexical analysis, provides a semantically and syntactically informative account.

References

Baker, C. F., Fillmore, C. J., and Lowe, J. B. (1998). The Berkeley FrameNet Project. In *COLING-ACL '98: Proceedings of the Conference, held 10–14 August 1998, in Montreal, Ont.* San Francisco, CA: Morgan Kaufmann Publishers, pp. 86–90.

Croft, W. (1991). *Syntactic Categories and Grammatical Relations.* Chicago, IL: University of Chicago Press.

Fillmore, C. J. (1982). Frame semantics. In Linguistic Society of Korea (ed.), *Linguistics in the Morning Calm.* Hanshin: Seoul, pp. 111–38.

Goldberg, A. (1995). *Constructions: a Construction Grammar Approach to Argument Structure.* Chicago, IL: University of Chicago Press.

Goossens, L. (1995). Metaphtonymy: the interaction of metaphor and metonymy in figurative expressions for linguistic action. In Goossens, L., Pauwels, P., Rudzka-Ochyn, B., Simon-Vandenbergen, A., and Vanparys, J. (eds), *By Word of Mouth.* Amsterdam: John Benjamins.

Johnson, C., Fillmore, C. F., Wood, E. J., Ruppenhofer, J., Urban, M., *et al.* (2001). The FrameNet Project: Tools for lexicon building. Technical Report, International Computer Science Institute, Berkeley, CA (forthcoming).

Levin, B. (1991). Building a lexicon: the contribution of linguistics. *International Journal of Lexicography,* 4(3): 205–26.

Levin, B. (1993). *English Verb Classes and Alternations: a Preliminary Investigation.* Chicago, IL: University of Chicago Press.

Levin, B., Song, G., and Atkins, B. T. S. (1997). Making sense of corpus data: a case study of verbs of sound. *International Journal of Corpus Linguistics,* 2(1): 23–64.

Miller, G. A., and Johnson-Laird, P. (1976). *Language and Perception.* Cambridge, MA: Harvard University Press.

Appendix

Table A1 Raw numbers

lemma	Total	In-Frame S	Msg-0	Msg-Tot	MsgNP	MsgS	MsgO	MsgQ Tot	MsgQ Pre	MsgQ Fol	MsgQ Split	Add-Tot	Add-0	Add-To	Add-At	Med FE	Topic FE	Mnr FE
bark-n	231	71	5	66	16	0	1	49	41	6	2	13	58	2	11	3	0	4
bellow-n	337	215	23	192	30	4	14	144	94	37	13	31	184	9	22	4	0	9
cluck-n	67	12	1	11	2	1	2	6	6	0	0	0	12	0	0	0	1	0
drawl-m	221	203	5	198	8	0	0	190	177	13	0	1	202	1	0	1	0	45
grate-n	333	108	0	108	0	0	0	108	90	3	15	2	106	1	1	0	0	21
grunt-n	296	105	4	101	15	0	3	83	70	7	6	2	103	0	2	3	0	5
gurgle-n	80	10	1	9	1	0	0	8	7	1	0	1	9	0	1	0	0	2
hiss-n	301	176	0	176	10	0	3	163	134	17	12	22	154	10	12	1	0	13
holler-m	29	22	4	18	1	1	4	12	8	4	0	4	18	0	4	0	0	1
mouth-m	178	119	2	117	63	2	1	51	25	23	3	13	106	7	6	1	0	15
mumble-m	224	210	33	177	35	6	4	132	105	19	8	12	198	12	0	0	9	21
mutter-m	228	219	24	195	29	6	1	159	121	31	7	29	190	28	1	3	14	38
say-c	232	191	0	191	14	70	6	101	71	26	4	4	187	4	0	1	1	14
scream-n	240	76	4	72	4	3	9	56	34	17	5	10	66	2	8	1	0	4
shout-m	253	211	61	150	24	9	13	104	64	40	0	56	155	16	40	1	2	9
stammer-m	183	166	30	136	20	3	0	113	97	16	0	2	164	1	1	2	3	6
thunder-n	289	68	10	58	4	1	5	48	42	6	0	8	60	0	8	2	3	2
warble-n	31	16	3	13	5	0	3	5	5	0	0	0	16	0	0	0	1	2
whisper-m	240	223	40	183	17	7	3	156	109	28	19	38	185	36	2	2	1	19
yell-n	226	157	22	135	10	3	15	107	64	38	5	48	109	9	39	1	0	6
Manner-V	1556	1373	199	1174	197	34	26	917	706	174	37	155	1218	101	54	10	29	154
Noise-V	2431	1014	73	941	97	12	55	777	587	132	58	137	877	33	104	15	5	68

Table A2 Percentages

lemma	Total	In-Frame S	Msg-0	Msg-Tot	MsgNP	MsgS	MsgO	MsgQ Tot	MsgQ Pre	MsgQ Fol	MsgQ Split	Add-Tot	Add-0	Add-To	Add-At	Med FE	Topic FE	Mnr FE
bark-n	n.a.	30.74	7.04	92.96	24.24	0.00	1.52	74.24	83.67	12.24	4.08	18.31	81.69	15.38	84.62	4.23	0.00	5.63
bellow-n	n.a.	63.80	10.70	89.30	15.63	2.08	7.29	75.00	65.28	25.69	9.03	14.42	85.58	29.03	70.97	1.86	0.00	4.19
cluck-n	n.a.	17.91	8.33	91.67	18.18	9.09	18.18	54.55	100.00	0.00	0.00	0.00	100.00	n.a.	n.a.	0.00	8.33	0.00
drawl-m	n.a.	91.86	2.46	97.54	4.04	0.00	0.00	95.96	93.16	6.84	0.00	0.49	99.51	100.00	0.00	0.49	0.00	22.17
grate-n	n.a.	32.43	0.00	100.00	0.00	0.00	0.00	100.00	83.33	2.78	13.89	1.85	98.15	50.00	50.00	0.00	0.00	19.44
grunt-n	n.a.	35.47	3.81	96.19	14.85	0.00	2.97	82.18	84.34	8.43	7.23	1.90	98.10	0.00	100.00	2.86	0.00	4.76
gurgle-n	n.a.	12.50	10.00	90.00	11.11	0.00	0.00	88.89	87.50	12.50	0.00	10.00	90.00	0.00	100.00	0.00	0.00	20.00
hiss-n	n.a.	58.47	0.00	100.00	5.68	0.00	1.70	92.61	82.21	10.43	7.36	12.50	87.50	45.45	54.55	0.57	0.00	7.39
holler-m	n.a.	75.86	18.18	81.82	5.56	5.56	22.22	66.67	66.67	33.33	0.00	18.18	81.82	0.00	100.00	0.00	0.00	4.55
mouth-m	n.a.	66.85	1.68	98.32	53.85	1.71	0.85	43.59	49.02	45.10	5.88	10.92	89.08	53.85	46.15	0.84	0.00	12.61
mumble-m	n.a.	93.75	15.71	84.29	19.77	3.39	2.26	74.58	79.55	14.39	6.06	5.71	94.29	100.00	0.00	0.00	4.29	10.00
mutter-m	n.a.	96.05	10.96	89.04	14.87	3.08	0.51	81.54	76.10	19.50	4.40	13.24	86.76	96.55	3.45	1.37	6.39	17.35
say-c	n.a.	82.33	0.00	100.00	7.33	36.65	3.14	52.88	70.30	25.74	3.96	2.09	97.91	100.00	0.00	0.52	0.52	7.33
scream-n	n.a.	31.67	5.26	94.74	5.56	4.17	12.50	77.78	60.71	30.36	8.93	13.16	86.84	20.00	80.00	1.32	0.00	5.26
shout-m	n.a.	83.40	28.91	71.09	16.00	6.00	8.67	69.33	61.54	38.46	0.00	26.54	73.46	28.57	71.43	0.47	0.95	4.27
stammer-m	n.a.	90.71	18.07	81.93	14.71	2.21	0.00	83.09	85.84	14.16	0.00	1.20	98.80	50.00	50.00	1.20	1.81	3.61
thunder-n	n.a.	23.53	14.71	85.29	6.90	1.72	8.62	82.76	87.50	12.50	0.00	11.76	88.24	0.00	100.00	2.94	4.41	2.94
warble-n	n.a.	51.61	18.75	81.25	38.46	0.00	23.08	38.46	100.00	0.00	0.00	0.00	100.00	n.a.	n.a.	0.00	6.25	12.50
whisper-m	n.a.	92.92	17.94	82.06	9.29	3.83	1.64	85.25	69.87	17.95	12.18	17.04	82.96	94.74	5.26	0.90	0.45	8.52
yell-n	n.a.	69.47	14.01	85.99	7.41	2.22	11.11	79.26	59.81	35.51	4.67	30.57	69.43	18.75	81.25	0.64	0.00	3.82
Manner-V	n.a.	88.24	14.49	85.51	16.78	2.90	2.21	78.11	76.99	18.97	4.03	11.29	88.71	65.16	34.84	0.73	2.11	11.22
Noise-V	n.a.	41.71	7.20	92.80	10.31	1.28	5.84	82.57	75.55	16.99	7.46	13.51	86.49	24.09	75.91	1.48	0.49	6.71

n.a., not applicable.

Table A3 Table abbreviations

Add	Addressee
Add-0	Number or percentage with no Addressee
Add-At	Number or percentage with *at*-type Addressee
Add-To	Number or percentage with *at*-type Addressee
Add-Tot	Total number or percentage with Addressee
F	Placement: following the verb
FEs	Frame Elements
Gn	Nominal message—the story
Gq	Quoted message—'Open the window!'
M	Tables 8 and 9: Manner expression present
Man	Header for Manner-presence column
Med	Header for Medium-presence column
Med FE	Header (Tables A1 and A2) for Mediums
Mnr	Manner
Mnr FE	Header (Tables A1 and A2) for Manner
Msg	Message
Msg-0	Number of sentences with no Message
MsgNP	Nominal Message
MsgO	Other syntactic Message
MsgQ Fol	Quoted Message following verb
MsgQ Pre	Quoted Message preceding verb
MsgQ Split	Quoted Message split around the verb
MsgQ Tot	Total quoted Messages
MsgS	Sentential Messages
Msg-Tot	Total Messages
Nse	Noise
P	Placement preceding the verb
Plc	Header for placement of Message
S	Placement split around verb
Spk	Speaker
Top	Topic
Topic FE	Topic Frame Element
Total S	Total sentences