

Metaphoricity Signals: A Corpus-Based Investigation

(Technical Report CSRP-03-05)

A.M. Wallington, J.A. Barnden, M.A. Barnden, F.J. Ferguson and S.R. Glasbey

School of Computer Science, The University of Birmingham
Birmingham, B15 2TT, United Kingdom

A.M.Wallington@cs.bham.ac.uk

0 Introduction

Metaphorical stretches of text are often found with certain common and relatively fixed lexical or graphical collocations. Thus the following expressions in italics, illustrating collocations from a much fuller and internally differentiated list that we shall present later, all appear in close proximity to a metaphor, depicted in bold:

1. *Something of*: there is *something of* **the night** about him. (Anne Widdecombe, 1997)
2. *In Miniature*: Slovenian Wines are **all the World in Miniature** (found using google)
3. *Literally*: He's *literally* **working his fingers to the bone** (found using google)
4. " ", *so to speak*: ie, should "**know the ropes**" *so to speak*. (found using google)
5. *Seemed, a sort of*: *Seemed a sort of* **death** (found in our study)

In this paper, we shall refer to these common collocations as '*metaphoricity signals*' or just *signals*, when the meaning is clear, and in section 2 we shall present a list and classification. Before doing this however, it is necessary to say a few words about terminology since our use of term '*metaphoricity signal*' is potentially misleading both with respect to the word '*signal*' and to the word '*metaphoricity*'.

The term should not be taken to imply that even if such signals invariably co-occurred with a metaphor, then the **function** of these metaphoricity signals is necessarily **to signal** a metaphorical stretch to the reader/listener; an instruction to move into metaphor processing mode, so to speak. There are other possibilities. For example, the existence of the signals close to a metaphorical stretch might play a role in helping to create the conditions for a metaphorical reading. What the signals shown above appear to have in common is that they suggest that in these particular cases the metaphorical stretch represents only one instance or aspect of what could be denoted or implied by the words comprising the stretch. Thus in sentence (1), there are only some aspects of the night relevant to the individual; there are other aspects of the night which may not hold. A similar point can be made with respect to sentences (4) and (5) and all three signals can be seen as instances of 'hedging' (G. Lakoff. 1973.). The use of the word '*literally*' in sentence (3) might appear odd on the face of it, but it suggests that there are also other ways of '*working one's fingers to the bone*'. Consequently, this sentence too conforms to the pattern.¹ '*In miniature*' would not normally be thought of as a hedge. However, it conforms to our criteria that metaphoricity signals imply that the metaphorical stretch represents only one instance or aspect of what could be denoted or implied by the words comprising the stretch. Let us express this slightly differently. We might say that the denotation of the source and the denotation of the target are included in the same set, which is one of the defining characteristics of metaphor according to the set-inclusion hypothesis of Glucksberg and Keyser (1993). If this is the case, then, as we have suggested, although the metaphoricity signals might signal to the analyst that there is a metaphorical reading of the accompanying stretch, their primary function for the participants in the discourse would be to help generate a set-inclusion reading. Of course, there are other possibilities apart from a signalling or a creating function.

¹ The conjunction of the word '*literally*' with a metaphor is very common. The reason why it is so used may be the following. A literal translation is a translation that is closest (at least in some respects) to the original. Thus it is the end point on a scale. As such it can have an intensifying function as well as implying that there are a set of entities that could be denoted by the metaphor.

Just as the term ‘signal’ should not be taken to imply a function for the participants in the discourse, the term ‘**metaphoricity**’ should not be taken to imply that the signals are only related to metaphors; only signals such as ‘metaphorically speaking’ are likely to unambiguously signal the presence of a metaphor. However, with the examples above and with the list that we shall present in section 2, it is just as likely that the signals signal some discourse effect that the speaker is negotiating with the listener. The presence of an accompanying metaphor would follow if it were the case that the metaphor is commonly used to convey these effects. See Cameron and Deignan (2003).

In short, the term metaphoricity signal is very much an analyst-oriented term. Metaphoricity signals signal to the analyst that there may be a metaphorical stretch and it is for this reason that we use the term in this report. Whatever their cognitive function, the principal bias in this study is to investigate how well metaphoricity signals could be used to signal metaphors to a computational analyst and so help automate the task of metaphor detection in large corpora.

Let us now return to the examples above. In the final two examples, we have assumed that there are two metaphoricity signals. Thus, in (4), either the inverted commas or the phrase *so to speak* could appear on their own with the metaphorical stretch. A similar point can be made with *seemed* and *a sort of* in example (5). In short, metaphorical stretches may appear with more than one signal and these signals are independent in the sense that neither requires the other and either could be used on its own with the metaphorical stretch. This is not meant to imply, of course, that they may not occur together more frequently than they would by chance. Thus, whatever the impact or role the signal may have on the metaphorical stretch, it may not necessarily be increased by the effect of having two such signals. This is something that Cameron and Deignan (2003), who raise the issue of the possible impact of multiple signals –tuning devices in their terminology– do not mention.

1 The Study

Although the co-occurrence of metaphoricity signals with metaphorical stretches has long been noted, albeit with different terminology, there has been little quantitative work done on how frequent the co-occurrence is or on how frequently the same phrases are found with non-metaphorical stretches. A relatively high frequency of co-occurrence coupled with a low frequency of co-occurrence with non-metaphorical stretches would help considerably in the task of automating the detection of metaphor and with it the creation of very large marked up corpora of metaphors. Thus we shall investigate how frequently metaphors co-occur with signals. We shall also investigate how frequently signals are followed by metaphors. Even if metaphors are only infrequently signalled, it may be the case that signals are a good guide to the presence of a metaphor. In other words, metaphoricity signals may have a positive impact on the precision of metaphor detection even if they have little impact on the recall.

Even if the frequency of metaphoricity signals were low for metaphors in general, there may still be a high correlation with certain types of metaphor. And if not with a class or classes of metaphor, then signals may correlate with metaphors conveying certain types of information, or with types of information about which the speaker has a particular attitude and which is often expressed metaphorically. For example, one hypothesis might be that whilst metaphors in general might not be signalled, active metaphors, or metaphors that expand on conventional metaphors to bring in new non-conventional elements, may be signalled.

Another hypothesis might be that spoken discourse where there is little opportunity to revise or fully recall what has been said but where there is an opportunity to monitor how the co-locuters are responding may signal metaphors to a greater or lesser extent than written text. Likewise, vague language, (see Carter and McCarthy 1995) or at least language that the speaker perceives as being vague or not fully explicit may be signalled; and many instances of metaphor may be considered vague.

To investigate the above questions an empirical study needs to be made of a corpus. Now, it is a relatively simple matter to search an enormous corpus automatically for different classes of signals, although whether the following text should be interpreted metaphorically or not will require a human analyst. But, as we have said, we also need to know the numbers or types of metaphor/information conveyed by metaphor that do not co-occur with particular signals. It is also relatively simple to search for specific terms from a limited number of domains that may have a metaphorical interpretation. See Koller, (2002), for a study in which war and marriage terms were sought automatically in texts that were not about war and marriage, but about company mergers and acquisitions. However, this is of only

little help if the intention of the study is to investigate the role of metaphoricity signals on metaphor in general. Furthermore, as work in the ATT-Meta project has shown, it is frequently the case that important aspects in the interpretation of a metaphorical utterance, even the most important, are map-transcending. That is, there are no mapping links between many of the elements in the metaphorical stretch and a target element (see for example Barnden & Lee TR5, Wallington et al submitted). These map-transcending elements will be linked in an inferential chain with source domain elements for which there exists a mapping link, but they may not be typical members of the source domain even assuming that the notion of a source or target domain can be given a coherent definition. Thus, a search using a practical number of source domain terms may well miss many metaphors. But we have already raised the hypothesis that it might be precisely these map-transcending or more active metaphors that are signalled.

Thus, it would appear that there is currently no reliable means of automatically detecting stretches of text that should be interpreted metaphorically, and thus no automatic means of investigating whether certain classes of signals occur with certain types of metaphor. There is therefore little option but to use trained human analysts. This is what was done in this study (see Wallington et al 2003). The problem, however, with using human analysts is that unless large teams of annotators are used on an almost industrial scale to annotate vast amounts of text then sampling errors will almost certainly occur. Human analysts entail small corpora and small corpora are likely to result in only a small number of authors or types of material being represented. This in turn is likely to result in the particularities of the sampled authors dominating. Furthermore, small corpora are likely to entail that only the most frequent types of metaphor or signal are found, and this is largely true of the study reported here.

This work is thus a preliminary, even an exploratory, exercise. It is an examination using a limited corpus and human analysts to see if there are likely to be any interesting patterns that can be looked for in a larger corpus. But this does not invalidate the exercise for as Cameron and Deignan note a detailed analysis of a small corpus may throw up interesting clues to significant patterns that could be searched for automatically in a larger corpus. It is only by careful study of the small corpus that many potentially unusual patterns may be found.

In section 2, we shall list the metaphoricity signals that we are using in the study. In section 3, we shall report on the outcome of the study and present some statistics.

2 Metaphor Signals

The following list is the result of a study over a number of years and was not compiled during the course of this study. Nor was it derived from the same corpora used in this study. It draws very heavily on a similar list created by Andrew Goatly and reported in chapter 6 of his book "The Language of Metaphors" (1997). However, not all of his signals have been included and for the large part, we have not followed his categorization. The list has largely been compiled by looking for collocations of metaphorical stretches that appear to the analyst/compiler to qualify in some manner or comment on the metaphorical stretch. The signals, then, are as follows:

Important Notes

- Question marks indicate particularly dubious signals.
- Obvious grammatical variants of the signals shown are implicitly included, such as putting verbs within them into past tense or passive voice. Thus, variants of "see as" include "seen as" and "saw as".
- Double parentheses are used below to indicate a device or class of phrases without actually exhibiting it/them. E.g. ((adjective)) means any adjective.
- A slash is used to indicate alternatives.
- Square brackets are used to indicate optional bits.
NB: "[some/a] sort of" covers the following:
 - sort of
 - some sort of
 - a sort of

- Explanatory comments including examples which clarify a particular signal are enclosed in curly brackets {}.

THE SIGNALS

A)Explicit signals of metaphoricity, similarity, etc. (where the signals themselves are not (very) metaphorical)

metaphor[ical[ly]] [speaking]
 figurative[ly] [speaking]
 analogous[ly], analogy, analog[ue]
 similarly, similar [to], simulacrum
 compared to
 symbol[ic[ally]],
 proverbial[ly]
 allegory/ical[ly]
 version

? fake, bogus, artificial, imitation, mock, pretend {ADJ}

in [much/somewhat/...] the same way
 in a similar way
 ? in this/that way, in these/those ways, ?? thus
 ? to put it another way

equivalent [of], equivalently
 correspond[ing[ly]]

liken ... to
 symbolize

alike
 [quite/bit/somewhat/much/little/almost/very/...] like
 {where "like" is an adjective, adverb or preposition, and excluding cases where it is followed by certain things, e.g. pronouns. }
 not unlike
 not dissimilar

{suffix:} [-]like
 {suffixes:} [-]ish[ly], [-]y
 {e.g.: a curry-ish meal; a glassy stare}
 {the hyphen may be important for "ish" and "y" because otherwise we may pick up far too many non-metaphorical words}

{suffix:} [-]ly
 {when it makes an ADJECTIVE, not an adverb; e.g. "matronly"; but we'll need to avoid ordinary adjectives ending in "ly", such as: likely, holy, wily.}

?? {suffix:} [-]ily {when forming an adverb}

-style, -fashion
 {e.g.: a big-city-style traffic-jam}

? as
 as ... as
 much/somewhat as
 just/exactly as
 [not] as ... as

not so ... as
as ..., so does ...
{e.g. as a man ages, so does a tree}

as if/though
as it were

B)Explicit signals of metaphoricity, similarity, etc. (where the signals themselves are quite metaphorical)

image, picture, painting, likeness, pattern, parody, caricature, effigy, lookalike, fashion, map, chart
{some are both nouns and verbs}
model, copy, parallel, mirror, echo, ??totem,
epitomize
act as
{NB:} pattern after, model on, fashion after, picture/caricature/paint/draw/cast as

C) Explicit signals of thinking-of-as (where the signals themselves are not (very) metaphorical)

think of ... as
consider ... as
consider ... to be
imagine ... as
imagine ... to be
? suppose ... to be

seem/appear to
seem like
suggest, suggestive of
bring to mind, remind ... of, make ... think of

D) Explicit signals of thinking-of-as, etc. (where the signals themselves are quite metaphorical)

look/sound/feel/taste/smell/ [[very] much / somewhat] like
look/sound/feel/taste/smell/ [[very] much /somewhat] as if/though
view / look at / look upon / see / regard ... as

E)Explicit signals of alternative or special sense being used

in a/another sense
in some/every sense
in both/all senses, in more than one sense
? in this/that sense

in a/one way
in some way[s]

F)Metalinguistic signals (incl. some that are themselves metaphorical)

so to speak/say
in a manner of speaking
[as/so] you might/could [almost/even/equally/ just as well] say
[what/as] you/one/we might/could [almost/even/equally/ just as well] call
as the saying goes

could swear that, almost swear that. could almost swear that
? in other words
? so-called

refer to ... as
describe ... as
? treat / handle / deal with ... as

((quotation marks))

in a nutshell

G)Bogus Signals of Reality

[quite] literally, real[ly], actual[ly], indeed, veritable, regular
just, true, truly
[quite] simply, to put it simply, simply put
{e.g.: he's just a bulldozer; simply put, he's a bulldozer}
to all intents and purposes

H) Signals of (Near-)Equivalence

same [thing] as
? no different to/from/than
amount to

almost, practically, virtual[ly], pretty nearly
as near ... as makes no difference
no less than, no more than, little more than

I)Approximative Categorizers

[a/some] [peculiar/bizarre/curious/odd/strange/unusual/special]
kind/sort/type/form/class/case of

a kind/sort/type of peculiar/bizarre/curious/odd/strange ...

peculiar/bizarre/curious/odd/strange {i.e., these adjectives by themselves}

more or less
a bit of a
half-
half a
somewhat of a
something of a
something ((adjective)) about ...
or something
or whatever
? a touch, a little

hint/trace/signs of
{e.g.: there was hint of the jungle about him}

((some cases of apposition, incl. ((noun phrase)), that/the ((noun phrase)) something ((adjective))))

{e.g.: housework, that treadmill;
Birmingham University, the goldmine of the Midlands;
there was something poisonous about him }

J)Signals of (Quasi-)Extremity

absolutely, thoroughly, utterly

super-((noun)), mini-((noun)), micro-((noun))

{e.g.: the car is a super-horse}

{NB: the hyphen is probably important: we want to avoid things like supermarket}

?? gigantic / tiny ((physical term))

{e.g. an atom is a tiny solar system

{similarly with other extreme words in place of gigantic/tiny}

?? than ((generic term))

{e.g.: he's taller than a Redwood tree}

K)Contrasters

if not ...

not so much ... as ...

L) Commonization of Proper Names

the/a/an/another [((adjectives))] ((proper name))

{e.g.: he's a modern Disraeli; the Beethoven of the twentieth century}

a kind/type/sort of ((proper name))

((genitive phrase)) ((proper name))

{e.g.: she is this country's Picasso}

((proper name or variant of one))ian

{e.g.: a Lakovian theory}

3 Findings

The corpus used in this study was created from six files taken from the British National Corpus. The files were chosen so as to cover a range of different types of text and genre, spoken and written, so that both a general study could be made, by combining the texts, and also specific comparisons could be made by comparing one text with (an)other(s). However, the range of files is not large enough to draw any strong statistical conclusions from the study. It is, for example, possible that the subject matter for the written files is more likely to contain metaphors than the spoken files. Whereas the different signals could be searched for automatically, this is not the case with metaphorical stretches of text. As part of the same metaphor annotation exercise, the student annotators had already individually annotated the texts used in this study together with other texts and it was found, as expected, that there was disagreement about what strings were metaphorical (see Wallington et al 2003). Therefore, in this study, the chosen texts were jointly annotated.

The type of texts used, labelled here texts 1-6, together with the number of words is as follows:

TEXT 1: words	cultural journalism (several journalists, no dialogue)	5661
TEXT 2: words	gardeners' radio programme (conversation)	6612
TEXT 3: words	dedication of war memorial (a speech)	6595
TEXT 4: words	a poetic novel	5760
TEXT 5: words	a religious book	9704

Taken together this amounts to a corpus of 38068 words. This is almost 10000 more than Cameron and Deignan's "small corpus", which is 28,285 words of transcribed talk, recorded in a UK primary school. It might be objected that including a poetic novel in the corpus is likely to bias the sample and our intention in including it in the sample was primarily for comparison purposes. However, as we shall see, as far as the number of metaphorical stretches that are signalled is concerned, there was no difference between this file and the other files. If we omit the novel from our sample, then we have a corpus of 32,308, which is still slightly larger than Cameron and Deignan's "small corpus". One possible problem is that the two conversations might be considered to involve more mundane language and possibly fewer metaphors than the language of the written texts. As we shall see, the spoken files do contain fewer metaphors.

3.1 Signalling

The first hypothesis we wish to explore is whether the metaphoricity signals do indeed signal metaphorical stretches. Thus we need to know the proportion of metaphors that are found in close proximity to one of the metaphoricity signals given in section 2. Secondly, we are interested in the proportion of signals that occur with metaphors. Table (1) Note that some metaphors have more than one signal. The following table displays this information.

	FILE 1	FILE 2	FILE 3	FILE 4	FILE 5	FILE 6	TOTAL
Medium	written	spoken	read	poetry	written	spoken	
Words	5661	6612	6595	5760	9704	3736	38068
Signalled metaphors / all metaphors	23/320 = 7.19%	9/120 = 7.5%	10/206 = 4.85%	22/553 = 3.98%	46/899 = 5.12%	8/100 = 8.0%	118/2198 = 5.37%
Signals for metaphors / all signals	24/58 = 41.38%	9/61 = 14.75%	11/54 = 20.37%	22/39 = 56.41%	43/81 = 53.09%	8/67 = 11.94%	117/360 = 32.5%

Table 1
Metaphoricity Signals as a Signal for Metaphors

Clearly the answer to the first question is that metaphoricity signals do not signal the metaphorical stretches. Furthermore, this lack of signalling appears to apply consistently across media. Of course, specific types of metaphor or metaphors conveying specific type of information may be consistently signalled. However, if one wanted to automate the detection of the metaphorical stretches in a file by using the presence of metaphoricity signals above, then one would be unsuccessful.

We can now turn to the second question of whether the presence of a metaphoricity signal is a reliable guide to a metaphorical stretch? At the very least one might expect that the metaphoricity signal "metaphorically speaking" would signal a metaphorical stretch. Here, the figures are very interesting, since they show a big difference between the spoken and written files, with File 3, the speech, tending towards the other spoken files. Whereas approximately half of all the signals are used to signal a metaphorical stretch in the case of the written files, it is only about an eighth for the two spoken files and a fifth for the speech. If these statistics could be replicated using the much larger corpus required for a full and proper study, then it would appear that for written language the presence of a metaphoricity signal is at least some help in signalling a metaphor. But why should this not be the case for spoken language?

Two factors could account for the difference. There may be more words that could potentially signal in the spoken files than in the written files but the number of metaphors is broadly similar or there may be far fewer metaphors but the number of signals is broadly similar. Of course, it is likely that both factors apply to a greater or lesser extent. The following table displays this information²:

² It can be misleading to divide words by metaphors since typically metaphorical stretches are longer than a single word.

	FILE 1	FILE 2	FILE 3	FILE 4	FILE 5	FILE 6
Medium	written	spoken	read	poetry	written	spoken
Words per metaphor	17.7	55.1	32.0	10.4	10.7	37.4
Words per signal	97.6	108.4	122.1	147.7	119.8	55.8

Table 2
Metaphor and Signal Frequency

It is immediately clear that the difference between the spoken and written files is due largely to the lack of metaphors in the spoken files, although the effect is compounded in the case of file 6 by a high number of signals. In other words, there are many more metaphors in the written files and this increase is not accompanied by an increase in the number of signals. Consider files 1 and 2. Table (1) shows that File 2 has 120 metaphors whilst File1 has 320 metaphors: 2.666 times as many. Of these metaphors, 9 are signalled in File 2, whilst in File 1 24 are signalled. Again, this is a figure that is 2.666 times bigger. However, more work is needed to establish the generality of these observations.

But why should there be more metaphors in written text? Until more work is done to establish whether there are indeed more, it may not be worthwhile even speculating. It is possible that the subject matter of the particular written files chosen is more likely to lend itself to metaphor than is the case with the spoken files. However, an adherent of the traditional view that metaphors are a literary device might not be too surprised. It may well be that with spoken language, happening as it does in 'real' time, there is less time to craft a good metaphor than there is with written language.

The standard retort to the view that metaphors are a literary device and not a part of normal discourse is firstly to stress the enormous generalizations about systems of polysemy that can be captured if one assumes that the language of one domain maps in a systematic way to the language of another. One can then point to the widespread, apparently trouble free, use of this polysemy in normal discourse. (See Lakoff 1993) Adherents of this view will further note that there are remarkably few completely novel metaphors. Instead, there are variations on existing themes. In short, metaphor might best be viewed as involving a mapping between concepts, or as the structuring of one concept in terms of another, rather than as a mapping between lexical items. And if metaphors are about our conceptual make up, then why should the medium matter? Why should spoken language be any different from written language?

However, even if we were to accept such a view, and by and large we do, it is still possible that these novel variants of conventional metaphors –henceforth, creative metaphors- are used more frequently in written language than in spoken. In written language there may be more time to develop thoughts and chains of inferences, including the chains of inferences that are needed to connect the map-transcending aspects of the metaphor with existing aspects. In short it might be argued that the number of conventional metaphors would be broadly similar across spoken and written files, but that there might be more creative metaphors in the written files. Of course, nothing would be gained if the additional creative metaphors were signalled to a greater extent than the more conventional metaphors.

As part of the study, the annotators were instructed to indicate whether they thought that a metaphor was a novel variant of an existing metaphorical view or family. Now, there is a slight problem with this instruction since it presupposes both that there exists a widely accepted and relatively fixed set of metaphorical views, and also that it is a simple matter to recognise an instance of one of these metaphorical views. Neither proviso is true. Although the annotators had access both to the Master Metaphor List at Berkeley (<http://cogsci.berkeley.edu/>) and the ATT-Meta Project Databank (<http://www.cs.bham.ac.uk/~jab/ATT-Meta/Databank/index.html>), it was recognised that these were not exhaustive and so the annotators were instructed to create a database of metaphorical views (<http://www.cs.bham.ac.uk/research/atmeta/DatabankDCA/index.html>). It proved to be a difficult task to decide whether a metaphorical stretch should be added to the database as a new metaphorical view or whether parsimony should be maximised and the stretch treated as a variant of an existing metaphorical view.³ The temptation obviously is to assume the former. Consequently, the true figures for the incidence of novel variants may be higher. The results are given in line one of table 3.

³ The issue is difficult because whilst it may be parsimonious to have a small number of very general metaphorical views, unless there were constraints on the general views, many metaphors would be predicted that do not occur.

	FILE 1	FILE 2	FILE 3	FILE 4	FILE 5	FILE 6
Medium	written	spoken	read	poetry	written	spoken
Novel (variants)	19	2	3	80	4 5	1
signalled	6 (31.58%)	0	0	10 (12.5%)	0	0

Table 3
Novel Variants of Conventional Metaphors

Although the figures appear to go in the right direction, it is clear from these figures that the lower number of metaphors in spoken text compared with written text is not a result of the higher number of creative metaphors. Thus, if we return to tables (1) and (2) and subtract the 19 creative metaphors in File 1 from 320 (i.e. the count of metaphors shown in Table (1)), the frequency will fall from the figure of 17.7 shown in table (2) to 18.8. If the exercise is repeated for File 4, the frequency decreases to 12.2. Thus even with the revised figures, the incidence of metaphor in our files is still much higher for the written files than the spoken files.

The difference with respect to metaphor frequency between written and spoken files was uncovered when we were attempting to explain why metaphoricity signals are followed by metaphors to a much greater extent in written texts than in spoken. If written language contains more creative metaphors than spoken language but the number of non-creative metaphors is broadly the same, then there will be more chance that a metaphoricity signal will be followed by a metaphor, all other things being equal.

However, this will only constitute an explanation for the difference in the signalling function of signals between spoken and written language if the creative metaphors are not signalled to any great extent. This appears from Table (3) not to be the case. Let us therefore discard the signals for creative metaphors and determine the proportion of signals that consist of signals for non-creative metaphors. If we return to the entry for File 1 in Table (1) row 2, we see that there were a total of 58 signals, 24 of which were used to signal metaphors, i.e. 41.38%. If we omit the 6 signals (Table (3), line 2) that were used to signal creative metaphors we have figures of 52 and 18. This gives a revised figure of 34.62%. In the case of File 4, omitting the 10 signals that were used to signal creative metaphors gives a revised figure of 46.48%. Both percentages are now closer to those shown for the spoken files, although still a long way from the 14.75% and the 11.94% of the two spoken files. Consequently, even with non-creative metaphors, there is still a far higher chance of a metaphoricity signal signalling a metaphor with the written files than with the spoken files.

In this section, we noted the large difference between spoken and written files with respect to the percentage of signals that signalled metaphors. Approximately half of the signals in written text were related to a metaphor, but only an eighth of the signals in spoken text. It appeared that this difference could largely be accounted for by the fact that there were more metaphors per word of text in the written files than in the spoken files. We then wondered whether the higher number of creative metaphors in written text could explain this. Unfortunately, whilst there did appear to be more creative metaphors in the written files, there were not nearly enough of them to account for the difference. Furthermore, many creative metaphors were signalled. The only proviso to add is that the annotators had no tools to help them in determining what is and what is not a creative metaphor and it may be worthwhile re-examining the relevant files: <http://www.cs.bham.ac.uk/~amw/dcaProject/metSigs/Joint>. Another possibility is that the language of the particular spoken files is less metaphorical than the language of the written files. Although three files of each type were chosen and the results were similar across all the spoken files and all the written files, the subject matter of the written files, -a series of cultural reviews, a poetic novel and a religious sermon- might be considered more abstract than geography lessons or gardening, i.e., the subject matter of the two spoken files. And, metaphorical language is commonly used to describe abstract subjects.

3.2 Classes of Signals

The primary hypothesis being explored in this study is whether metaphors are signalled by

⁴ The annotators were asked to give one of 5 confidence measure to the possibility that a metaphorical stretch was a novel variant. These ranged from -2 indicating that they were sure the stretch was not a novel variant to +2 indicating that they were sure that it was. The figure of 5 here includes 4 with a confidence value of 0. The figure of 80 in the previous column includes 8 with a value of 0. The figures in the other columns do not include any 0s.

metaphoricity signals to any extent. Stated in such general terms, the answer as we have seen is no; approximately 5% of them are. The situation is better if we want to use a metaphoricity signal as a guide to the likelihood of a metaphor. In the case of the written files, we find that approximately half of the signals signal a metaphor. However, many refinements are possible of this very general hypothesis. For example, certain classes of metaphor may be signalled more reliably than other classes. Likewise, some classes, or even examples, of metaphoricity signal may make more reliable signalers.

A class of metaphor that might be signalled to a greater extent than metaphors in general are what we have been calling creative metaphors i.e., novel variants of conventional metaphors. If we return to Table (3), only 2 files have a significant number of creative metaphors. These are file 1 and file 4. In files 1, 6 of the 19 creative metaphors are signalled, i.e., 31.58%. In file 4, 10 of the 80 creative metaphors are signalled, i.e., 12.5%. It is difficult even to speculate from such a paucity of data, although both percentages are higher than the corresponding figures in table 1 for all metaphors.

Let us now look in more detail at the specific classes of metaphoricity signals. One question is how frequently the individual classes are used to signal metaphorical stretches. One might expect class A (i.e. explicit signals of metaphoricity) to be used a lot, but what of the others? We noted earlier that even with written language metaphoricity signals only signal metaphors in approximately 50% of cases. A further question, then, is whether any of the classes improve upon this figure? In other words are some of the classes or signals only used to signal metaphors and do not appear with non-metaphors? Unfortunately, both these questions are confounded by the paucity of the data. However, the following table shows the frequency with which the different signals are used to signal a metaphorical stretch.

Classes	A		B		C		D		E		F		G		H		I		J		K		L	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1	11	17	1	0	4	5	2	0	0	1	0	1	1	5	0	0	5	4	0	0	0	0	0	0
2	3	13	0	0	1	5	0	0	0	0	0	3	2	28	1	3	2	4	0	0	0	0	0	0
3	2	26	0	0	1	4	0	0	0	0	0	2	4	16	0	2	2	0	0	0	0	0	0	0
4	18	10	0	0	1	3	0	0	0	0	1	2	0	0	0	1	1	0	1	0	0	1	0	0
5	15	12	3	2	4	3	4	3	0	0	8	1	4	9	1	1	3	5	0	0	0	0	0	0
6	0	13	0	0	1	5	0	0	0	2	0	0	6	24	0	1	1	14	0	0	0	0	0	0
total	49	91	1	0	12	25	6	3	0	3	9	9	17	82	2	8	16	27	1	0	0	1	0	0

Table 4
Classes of Metaphoricity Signal
(‘+’ indicates a signal that signals a metaphorical stretch and ‘-’ a signal that does not.)

By far the most common class is A: ‘Explicit signals of metaphoricity, similarity, etc.’ However, this is true only for our corpus as a whole. If we look at the frequency with which Class A signals appear with the different files, then a big difference between the spoken and written files emerges again; Class A signals are much more frequent than other signals only for the written files, 1, 4 and 5. Furthermore, Class A signals are particularly bad at signalling a metaphorical stretch in the spoken files. In section 3.1, we noted that there was a big difference between the spoken and written files with respect to both the number of metaphors and the number of signals that actually signal metaphors. Consequently, it is not surprising, given that Class A signals comprise the bulk of the signals, that there are more Class A signals with the written files than with the spoken files.

Another fact that emerges from Table (4) is that Class G signals (Bogus Signals of Reality) form very bad signals of metaphoricity, with almost five times as many signals not signalling a metaphor as signal a metaphor. Class H signals (Signals of (Near)-Equivalence) are not much better in terms of the proportion of successful signals, but there are far fewer signals

4 Conclusion

What has emerged from this exploratory exercise is that metaphors are rarely signalled by metaphoricity signals. We wondered whether active metaphors might be signalled more frequently than non-active metaphors, but we could not find any support for this view. Reversing the question and asking how successful metaphoricity signals are in signalling metaphors brings a slightly more positive

answer. With the written files approximately half of the signals were followed by a metaphor, although the figure is far less for the spoken files, resulting in a combined figure of approximately a third. The reason for this difference appears to be that the written files contain many more metaphors than the spoken files; metaphors, what is more, that are not signalled. Turning to specific classes of signals, we find, as would be expected, the same result. With Class A signals, in the written files 44 out of the 83 signals, signal a metaphor, whilst only 5 out of 57 signals signal a metaphor in the spoken files.

In this study we have not performed any detailed statistical analysis and specified whether our findings are 'significant' or not. The reason for this is the size of the corpus. Any discussion of significance would only hold of the specific files examined and there is no reason to think that our files are representative of spoken and written language. Clearly to make any firm conclusions a far bigger and more balanced corpus is required. However, the difference between the spoken and written files that has emerged suggests that it would be worthwhile to attempt a further study with a much larger corpus.

References

- Barnden, J.A. and Lee, M.G. (2001) *Understanding open-ended usages of familiar conceptual metaphors: An approach and artificial intelligence system*. Technical Report CSRP-01-05, School of Computer Science, The University of Birmingham, U.K
- Cameron, L and Deignan, A. (2003) Combining large and small corpora to investigate tuning devices around metaphor in spoken discourse *Metaphor and Symbol*, 18(3), pp. 149-160.
- Carter, R. and McCarthy, M. (1995) Grammar and the Spoken Language. *Applied Linguistics*, 16(2), pp.141-158.
- Goatly, A. (1997) *The Language of Metaphors*, London and New York: Routledge
- Glucksberg, S. and Keysar, B. (1993) How metaphors work. In A. Ortony (Ed.), *Metaphor and thought* (2nd ed), pp. 401-424. New York, Cambridge: Cambridge University Press.
- Koller, V. (2002) "A shotgun wedding": Co-occurrence of war and marriage metaphors in mergers and acquisitions discourse. *Metaphor and Symbol*, 17(3), pp. 179-203.
- Lakoff, G., (1973). Hedges: A Study in Meaning Criteria and the Logic of Fuzzy Concepts. *Journal of Philosophical Logic*, 2, pp. 458-508.
- Lakoff, G., (1993) Contemporary theory of metaphor. In Ortony, A. (ed) *Metaphor and Thought* (2nd ed), pp. 202-251. New York, Cambridge: Cambridge University Press.
- Wallington, A.M., Barnden, J.A., Buchlovsky, P., Fellows, L. & Glasbey, S.R. (2003) *Metaphor Annotation: A Systematic Study*. Technical Report CSRP-03-4, School of Computer Science, The University of Birmingham, U.K.
- Wallington, A.M., Barnden, J.A., Glasbey, S.R. & Lee, M.G. (accepted). Metaphorical reasoning with an economical set of mappings. To appear in *Delta* (LAEL, Brazil).