Representing and processing idioms[*]

ROSA ELENA VEGA-MORENO

Abstract

This paper focuses on the way in which idioms are mentally represented and how they are processed in on-line comprehension. The aim is to develop an account of how hearers understand unfamiliar idioms, familiar idioms and idiom variants. It will be argued that idiom meanings are represented and stored holistically in the form of structured phrasal concepts, and that their comprehension is achieved through just the same processing mechanisms as the comprehension of non-idiom strings. The account is grounded in two main assumptions. First, our powerful inferential interpretive abilities enable us to create and understand concepts 'on the fly'. Second, the utterance comprehension process, which often involves such ad hoc concept construction, is regulated not by an expectation of literalness but by an expectation of optimal relevance.

1 Introduction

The mental representation of idioms determines considerably how those idioms are processed in a particular utterance. Also, the information that is represented on-line often depends on the information available in the context where the idiom is processed. Therefore, an adequate account of idioms needs to provide some answers to two basic and highly related questions: How are idioms represented in the mind? And, how are idioms processed? This paper attempts to answer those questions. It first examines previous accounts of idioms and their claims. It then presents an outline of Sperber & Wilson's Relevance Theory and defends an alternative approach to idioms that pursues their framework. An analysis of the comprehension of unfamiliar idioms, familiar idioms and idiom variants is developed and some evidence supporting the relevance-theoretic account is presented. The essay closes with a brief look at the

[*] I would like to thank Robyn Carston for detailed comments on earlier drafts of this essay and for numerous useful discussions on the topic. Many thanks also to Deirdre Wilson for helpful suggestions and constant support.

more general field of creative cognition and its relation to idiom production and comprehension.

2 Traditional ('non-compositional') views on idiom representation and processing.

2.0 For many years, the standard way of looking at idioms has been to consider them words (lexical items) which are listed and retrieved as chunks from the lexicon. According to this view, there is no need to worry about idioms, no need for a complex theory of how to communicate with them. The motivations for claiming this are based on the belief that the meaning of an idiom is in no way recovered from the meanings of its individual constituents and that idioms behave as syntactic as well as semantic units. That is, there is nothing in the meanings of '*the*', '*kick*' and '*bucket*' that tells us that *kick the bucket* means DIE. Furthermore, there is no way, once we are familiar with the idiom, to break up its meaning into the individual constituents of the string. Finally, since idioms are inserted in the syntactic structure at X^o, the prediction is that very little modification is going to be permitted. This makes it impossible for (1) to have idiomatic reading.

(1) **The bucket was kicked by Peter*

In fact, when transformations of idioms are allowed, such as that in (2) where there is no loss of the figurative meaning of the idiom, they would need to be stipulated by ad hoc 'idiom rules' (Fraser 1970). Furthermore, other types of changes, such as internal modifications, as in (3)-(4), or lexical substitutions, as in (5)-(6), are left unexplained.

(2) *The beans were finally spilled*
(3) *Speak your parental mind*
(4) Don't look at me, *I didn't spill a single bean*
(5) Ok now, *I found my train of thought*
(6) *He poured the beans*

An important problem with the traditional view is that, as (2)-(6) show, idiom modifications (idiom variants) are not strange. In fact, they are so common in everyday speech that one can view them as the rule rather than the exception. Although we would not want to deny that these forms are somehow parasitic on the original idiom, we would like a model which would explain them in some more motivated way than by means of unrelated and stipulated rules.

Since the main argument of the standard model presented here is that idioms are represented as non-compositional strings in the lexicon, it is often known as the 'non-compositional model' of idiom comprehension. Several psycholinguistic accounts have been proposed following this line of thought.

2.1 The literal first hypothesis

Bobrow & Bell (1973) propose the idiom list hypothesis (or literal first hypothesis) in which they argue that idioms are mentally represented and processed as lexical items. They are not only listed as long words but independently stored in an idiom lexicon different from our normal mental lexicon. According to this view, literal reading is not optional and comes prior to retrieving the idiomatic meaning. This position predicts a complex three-step comprehension model. The hearer must first process the literal meaning, then reject the interpretation and finally check the idiom lexicon and provide a correct interpretation. This psycholinguistic account reminds us of standard pragmatic Gricean views on figurative language understanding. The speaker uttering a figurative expression can be taken to be flouting the maxim of truthfulness or literalness. Although he would be taken to be co-operative at a deeper level, this pragmatic model also favours the literal first hypothesis. Current literature on psycholinguistics and pragmatics, however, provides good evidence to challenge the priority of literal interpretation. (Gibbs 1994; Recanati 1995; Sperber & Wilson 1986; Wilson 1995). In this paper it will be shown how idiom processing presents extra evidence in support of this challenge.

2.2 The simultaneous processing hypothesis

Swinney & Cutler (1979) also argue against the priority of literal interpretation and propose the lexical representation hypothesis (or simultaneous processing hypothesis) which defends parallel processing instead. The motivation for departing from the idiom list hypothesis comes from experimental findings that show subjects do not take longer to understand idioms (e.g. *kick the bucket*) than literal strings (e.g. ‘strike the pail’) (Ortony et. al. 1978; Swinney & Cutler 1979). Coherent with these findings, Swinney & Cutler propose a model of parallel processing. Idioms are also viewed as mentally represented and processed as lexical items but are considered to be stored in the normal (and not in a special) lexicon. Thus, when a hearer/reader encounters the first constituent word of an idiom string, both figurative and literal processing run in parallel. However, the figurative interpretation is often soon favoured.

2.3 The figurative first hypothesis

Gibbs (1980) presents the direct access hypothesis (or figurative first hypothesis) which departs even more radically from Bobrow & Bell's account. This hypothesis proposes that idioms are to be considered lexical items whose idiomatic meaning is retrieved directly from the mental lexicon as soon as the string starts to be heard. Gibbs points out an interesting possibility that challenges Swinney & Cutler's account. He suggests that the finding that idioms (e.g. *kick the bucket*) are processed faster than literal strings (e.g. 'strike the pail') does not necessarily imply that literal processing must take place at all. According to his account, the literal reading is not only not prior to the idiomatic one but it can also be completely bypassed. Gibbs moves to a different account in later work in which he still defends the priority of figurative processing. His new line of thought, which is highly influential, is based on the idea that the linguistic form of the idiom is often not completely unmotivated (Gibbs 1992).

2.4 Some conclusions on non-compositional accounts

Whenever current accounts of idioms mention non-compositional views it is to criticise them for being unable to account for idiom flexibility. That is, for the existence of idiom variants, such as those in (2)-(6). As has been shown, storing idioms as lexical items is problematic since on that basis no modification, or very little, is expected. Another problem is that some of these views seem to imply that idiomatic meaning can be literally paraphrased (Makkai 1972). That is, *kick the bucket* is seen as meaning the same as the verb 'die' and *spill the beans* as meaning the same as the expression 'reveal a secret'. The account I will develop departs from this position for several reasons, the main ones being that idioms cannot be paraphrased without loss and that the concept encoded by the use of an idiom goes beyond logical links with related concepts (e.g. DIE, REVEAL). For instance, the concept encoded by the idiomatic expression *kick the bucket* contains information about the manner of death, the attitude involved and something imagistic, among other things. Thus, *kick the bucket* does not mean just DIE as one would not say of a criminal who died by execution or a patient that passed away after along illness that they *kicked the bucket*. All in all, there is a great advantage in the approaches presented so far which is commonly unnoticed. A consequence of viewing idioms as lexical items is that they can be seen as holistic conceptual entities. Hence, it seems that an adequate approach to idioms needs to account for their flexibility, but also for the complexity and holism of their conceptual representations.

All these standard accounts highlight questions which are of great interest, not only to the study of idioms, but to the study of figurative language in general. These questions include the following: can we ignore literal meanings (as Gibbs' account seems to imply)? Is it plausible to have two processing modes, one for literal and the other for figurative language (parallel processing hypothesis)? If there is only one processing mode, is it literal (literal first hypothesis)? or is it figurative (figurative first hypothesis)? These are interesting and difficult questions that will be addressed in the course of the paper.

3 Current ('compositional') views on idiom representation and processing

3.0 There is a tendency among current accounts to argue against treating all idioms as non-compositional strings. The main argument against this view is that the relation between the idiomatic meaning and the linguistic form of most idiomatic expressions is often not completely arbitrary. In most cases, idiomatic meaning is somehow recovered from the meanings of the individual constituents in the string (e.g. the meanings of '*pop*' and '*question*' in *pop the question*). The idea that idioms are to be placed along a continuum of compositionality[1] is commonly known as the decompositional hypothesis (Nunberg 1978; Nunberg et al. 1994).

Nunberg and his colleagues argue that idiomaticity is a semantic rather than a syntactic phenomenon and propose a typology of idioms regarding their degree of compositionality. The constituents of non-compositional (or opaque) idioms (e.g. *kick the bucket*) do not contribute to the idiomatic meaning. If the individual constituents in the string contribute – literally or metaphorically – to the figurative interpretation, the idiom is said to be decomposable (e.g. in *spill the beans*, '*spill*' refers to the 'act of revealing' and '*the beans*' refers to 'secrets'). This is an oversimplified outline of the approach which also deals with other aspects of idiomaticity, such as figuration, proverbiality, informality, affect, inflexibility and conventionality. The decompositional account of idioms has been highly influential and widely tested (Cacciari 1993; Gibbs 1981; Gibbs et. al. 1989). What this new line of thought seems to evidence is that whatever account of idioms we propose it needs to acknowledge the role that constituent word meanings play in their comprehension.

---

[1] The term compositionality is rather misleading with regard to idioms since no idiom is completely compositional. A 'compositional idiom' is an idiom whose meaning is somehow related to the meaning obtained by computing the string literally. The degree of relation differs across idioms.

3.1 The conceptual metaphor hypothesis

Gibbs (Gibbs 1994; Gibbs et. al. 1997) has developed an account of idioms which is based on the work of Lakoff & Johnson (1980), who assume that language use is constrained and motivated by pre-existing metaphorical schemas in our mind, which are grounded in our bodily experience. Understanding an idiom, such as *spill the beans* is partly a matter of mapping the two metaphors that motivate it: MIND IS A CONTAINER and IDEAS ARE PHYSICAL ENTITIES. Although highly influential, this approach is not free from criticism (Keysar & Bly 1999; Glucksberg et. al. 1993). There are convincing arguments against it, but there are some interesting points Gibbs makes which are worth serious consideration. For instance, the belief that our thought is metaphorically grounded implies that literal interpretation does not play a major role in language understanding. So, although he takes a rather extreme position, his account implies a challenge to the priority of literal interpretation.

3.2 The configuration hypothesis and phrase-induced polysemy model

The most compelling account of idioms that has been proposed so far is the configuration hypothesis (Cacciary & Tabossi 1988; Cacciari & Glucksberg 1991). This approach presents a rather interesting proposal which tries to rescue the simultaneous processing hypothesis without committing to the idea that idioms are stored as lexical items. On the one hand, idioms are grouped together with other memorised strings such as lyrics, poems, titles of songs, etc. On the other hand, compositional idioms enjoy distributed representation and so they are processed as any sequence of words. The constituents of compositional idioms are said to become polysemous with use. For instance, in the case of *spill the beans*, the lexical form '*spill*' includes an extra sense REVEAL and the lexical form '*bean*' includes a figurative sense SECRET. According to this account, understanding an idiom such as *spill the beans* is a matter of selecting the appropriate sense of each of its constituent words on-line so that the string can be recognised as a configuration. This is often referred to as the Phrase-Induced Polysemy (PIP) hypothesis of idiom comprehension (Glucksberg 1993, 2001). Idioms are said to be processed literally until, at some point after the beginning of the string, the configuration emerges and the idiomatic meaning is activated. Literal and figurative processing run in parallel for a while until the idiomatic meaning is taken as the intended interpretation. Furthermore, since the recognition of idioms is often context-dependent, hearers usually recognise that the

words in an idiom form a configuration only after they hear the first or second content word in the string - known as the 'idiomatic key'.

This view, which I have oversimplified here, presents a typology of idioms regarding their degree of compositionality and transparency that entails at least three different analyses of idiom comprehension (Cacciari & Glucksberg 1991; Glucksberg 1993). One analysis should deal with opaque idioms (e.g. *kick the bucket*), whose idiomatic meaning is arbitrarily stipulated. Another one, which I have just outlined, deals with compositional idioms whose meaning can be partly distributed along their constituents. Finally, they propose a way of looking at how quasi-metaphorical (or allusional) idioms, of the sort *carry coals to Newcastle*, are comprehended. Hearers understand these idioms by computing their literal meaning and recognising the strings as (conventional) prototypical instances of the concepts they represent. Quasi-metaphorical idioms refer simultaneously to both the figurative and the literal referent. In comprehension, the hearer infers on-line the figurative meaning from the literal one.

In fact, the analysis of quasi-metaphorical idioms is quite similar to the analysis these scholars give to nominal metaphors of the sort 'my job is a jail' (Glucksberg & Keysar 1990; Glucksberg et. al. 1997). The vehicle of the metaphor is said to have dual reference. The literal referent (actual jail) is a prototypical instance of the second, more general, figurative referent ('confining punishing thing'). This interesting analysis brings together metaphor and idiom which are intuitively (and probably also historically) related. However, it does so at the expense of having to treat the comprehension of quasi-metaphorical idioms along quite different lines from the comprehension of other compositional and non-compositional idiomatic strings.

In sum, this account presents very interesting issues as well as being able to account for the phenomenon of idiom flexibility in simple terms – idioms are linguistically processed in the same way as other configurations of words. However, as section 5.4 will show, the configuration hypothesis sometimes fails to account for conceptual integrity and holism, and it does not offer any cognitive principles to tell apart acceptable from unacceptable idiom variants. Finally, the functional typologies and analyses of idioms presented on this approach entail that the linguistic forms of idiomatic expressions can contribute in several different ways to the overall figurative meaning of the string. However, one might wonder whether idioms (and idiom variants) are really understood in such a range of ways.

4 Relevance Theory and ad hoc concepts

In *Relevance: Communication and Cognition* (1986), Sperber & Wilson presented a new approach to the study of human communication. Like Grice, they view verbal communication as an instance of ostensive-inferential communication. Unlike Grice, they deny the existence of maxims (or rules) of conversation that the participants must know and use in order to communicate. The principles governing inferential communication follow directly from principles governing human cognition.

Cognitive Principle of Relevance
Human cognition tends to be geared to the maximisation of relevance.

Communicative Principle of Relevance.
Every utterance communicates a presumption of its own optimal relevance.

Information is processed at a cost, and may yield enough benefits (positive cognitive effects) to be worth the effort. Sperber & Wilson define Relevance in terms of processing effort and cognitive effects. The greater the cognitive effects, the greater the relevance; the smaller the processing effort, the greater the relevance. Since verbal comprehension necessarily involves the expenditure of effort, the hearer should expect the speaker's utterance to be relevant enough to be worth the effort of processing. The hearer should therefore look for the first interpretation that satisfies his expectations of relevance and assume that this is the intended one. Comprehension is guided by the following (modularised) relevance-theoretic comprehension procedure:

Relevance-theoretic comprehension procedure
Follow a path of least effort in computing cognitive effects:
a. Consider interpretive hypotheses in order of accessibility.
b. Stop when your expectations of relevance are satisfied.

Relevance theorists have recently argued that the pragmatic development of the propositional form obtained by linguistic decoding does not only involve processes of disambiguation and referent assignment. It often involves also the construction of ad hoc concepts that are included as part of the proposition expressed by the speaker in order to guarantee valid inference. They defend the view that both the pragmatic strengthening and the pragmatic broadening of an encoded concept contribute to the proposition expressed and endorsed by the speaker (Carston 1996, 1998, forthcoming; Sperber & Wilson 1998; Wilson & Sperber 2000). The motivation underlying this account is based in part on the work on ad hoc concept construction developed by

Barsalou and other scholars and in part on the very nature of inferential communication. Barsalou's compelling evidence shows that our minds are extremely flexible and that, in response to particular communicative or other goals in particular contexts, we can construct concepts on the fly (Barsalou 1983, 1987, 1991). In fact, Barsalou's view fits perfectly well with the inferential account of communication that Sperber & Wilson propose. If one takes the inferential account of communication seriously, the linguistically encoded material can be taken as a mere cue to inference. Hence, an encoded concept can, and often does, differ from the concept that it is used to communicate. The hearer's task is to recover the latter by means of the former (and the help of background knowledge) via inference. Furthermore, since the hearer is guided by the relevance-theoretic comprehension procedure, he will stop processing once he has arrived at an interpretation that satisfies his expectations of relevance, that is, an interpretation that provides sufficient cognitive effects for the least processing effort possible. Since hearers are often satisfied by a less-than-literal interpretation, literal interpretations are often not developed. Here are some examples:

(7) The fish ate the mariner [FISH*]
(8) Peter's house is square [SQUARE*]
(9) My lawyer is a shark [SHARK*]

(7) is a case of concept narrowing (or enrichment) in which the decoded concept provides more encyclopaedic information than is actually needed. The hearer must narrow down the concept FISH on-line to pick out the particular type of fish intended (e.g. shark) and so enrich the interpretation to warrant contextual effects. (8) is a case of loose talk in which the concept communicated does not include the logical or definitional properties of the concept encoded. In the comprehension process, the hearer needs to weaken the concept to mean something like 'roughly square'. The easiest way of doing this is by processing the information obtained from the encoded concept but not its logical entry (which if considered is quickly dropped) that entails geometric perfection. (9) is a case of an ordinary (nominal) metaphor, which, according to Relevance Theory, also involves a loose use of the encoded concept. The interpretation process is guided here, as in the other cases, by the relevance-theoretic comprehension procedure and goes as below.

The hearer takes the encoded concept SHARK together with background knowledge as a starting point to infer the concept the speaker wants to communicate. Following a path of least effort in computing cognitive effects, he sets up a concept SHARK* and starts copying into it in their order of accessibility logical and/or encyclopaedic

properties of the encoded concept until his expectations of relevance are satisfied, at which point he stops. He will probably copy the properties of being aggressive, dangerous and treacherous while the property of being a fish or having fins might never be considered.

A well accepted aspect of natural language comprehension is the idea that feature/property accessibility is context-dependent (e.g. Barsalou 1980). That is, in a context where one is planning to move home, the property 'heavy' of the concept PIANO is rather more salient than the property 'expensive', although the latter will be highly relevant in a context were we plan to buy one. Relevance Theory proposes a cognitive explanation to account for this property accessibility and to explain at which point to stop processing. Since the hearer is guided by the relevance-theoretic comprehension procedure, only properties that contribute to cognitive effects are considered. That is, not all the features or properties of encoded concepts are processed. If they were, we would be dealing with a case of strictly literal interpretation.

Relevance Theory also challenges the traditional belief that the computation of the literal interpretation is necessarily prior to the retrieval of the figurative meaning. In this framework, literal interpretations are seen as at one extreme on a continuum of loose use: the extreme at which not only some but all of the properties of the encoded concept are communicated. A literal interpretation is then, only one possibility among many and not necessarily the one to be preferred. As (7)-(9) show, speakers do not aim at literalness but at relevance. Furthermore, the comprehension process, literal interpretations are rarely developed since hearers are often satisfied by a less-than-literal interpretation.

The concepts resulting from processing (7)-(9) merely resemble the concepts linguistically encoded (as represented by the use of the asterisk). Each of these newly created concepts, not the encoded ones, is considered to be the one the speaker intended as a constituent of the proposition expressed by her utterance. That is, in order to ensure that the implicatures of the utterance are properly inferentially warranted, the proposition developed from the logical form in each of these cases includes the concept that has been created on the fly, i.e. FISH*, SQUARE*, SHARK* (for more detailed discussion of this idea, see Wilson & Sperber 2000). The proposition expressed is communicated (hence is an explicature) along with the various implicatures.

The main aim of my paper is to argue that the relevance-theoretic line of thought presented here also enables us to provide a satisfactory account of the comprehension of idioms and their variants.

5 A relevance-theoretic account of idioms

5.0 The hypothesis I want to develop is that idioms are mentally represented and processed as structured phrasal concepts and understood following considerations of relevance. As the idiom is heard, both the concepts underlying the individual constituents in the string and the concept underlying the idiom as a holistic unit are activated. Precisely which of this activated information is accessed and processed on-line follows from considerations of relevance. On the one hand, idioms are seen as conceptual units. They encode conceptual representations that have no equivalent in any non-idiomatic linguistic string and thus cannot be paraphrased without loss. On the other hand, since the concepts underlying idioms have internal structure, they are processed in much the same way as other non-idiomatic sequences of words. However, although, in principle, idioms can be highly flexible, syntactic and/or semantic modifications of the original form of the idiom are constrained by strong pragmatic principles.

5.1 The role of constituent word meaning

Looking at the role of word meanings is fundamental in understanding idiom processing, or so it has been claimed during the last twenty years. This argument applies to most idioms in so far as the relation between the linguistic form of the string and the idiomatic meaning is not completely arbitrary. To recall an example, the literal meanings of '*pop*' and '*question*' in *pop the question* are good cues to infer the idiomatic meaning of the expression. In this way, '*pop*' can be taken to mean 'utter in a sudden way' and '*question*' to refer to a specific type of question, a 'marriage proposal'. But, how does this 'mapping' and assignment of meaning take place? Is this information always instantiated in understanding an idiom? I believe these are not trivial questions, especially if we take into consideration that acknowledging the role of word meanings has revolutionised the study of idiomaticity altogether. Thus, if we are going to view idioms, or at least most idioms, as compositional strings, we need to analyse the role that word meanings play in idiom understanding.

To start with, it is not sufficient to say that the individual constituents in the idiom contribute to the idiomatic meaning; one has to explain the nature of this contribution and the extent to which it affects idiom understanding. Also, the term 'compositional', used to refer to the group of idioms mentioned above, is quite confusing. Even so-

called 'compositional' idioms are not compositional in the strict sense since the meaning of the idioms is not completely recovered from the meanings of its parts. Thus, even if we acknowledge the role that word meaning plays in idiom comprehension, we still have to explain where 'the rest' of the meaning of the idiom come from. Furthermore, an adequate account of idioms should aim to explain how all this information coming from constituent word meanings and/or other sources (e.g. context) is accessed and integrated to build up the meaning of the idiom. One of the main aims of this paper is to show how this is done.

We use idioms because we want to communicate a thought we have in our minds and we think that the use of such an expression is the best way to put that thought across. In the case of unfamiliar idioms and idiom variants, the concept communicated cannot be directly retrieved. I believe these expressions require the creation of an ad hoc concept on-line whose content is often obtained in part by searching the encyclopaedic entries of the concepts encoded by the idiom. However, in idiom understanding, computation of word meanings (as well as concept construction) is costly and should be avoided if a cheaper alternative is available. The cheapest alternative for identifying the intended concept is to retrieve its meaning directly from the mental lexicon. This is obviously only possible in the case of familiar idioms. However, even in comprehending familiar strings, word meanings may still play a (minor) role. As we will see, the point at which an idiom is retrieved depends on context and computation of the first few words sometimes occurs before the familiar idiomatic meaning is retrieved (Tabossi & Zardon 1995). In sum, this paper will show that the information contained in the constituent word meanings of an idiom string might be accessed on-line. Still, this process is highly constrained by pragmatic considerations and so only takes place at certain points during idiom processing and in certain circumstances.

5.2 The acquisition of unfamiliar idioms

(10) I am not going to *eat my brain* for what happened. What is done is done.
(11) Leave him alone. Don't *put your finger in the wound*.
(12) You always *drown in a glass of water!*[2]
(13) His granddad *kicked the bucket* yesterday.

[2] Examples (10)-(12) are English translations of Spanish idioms.

In processing (10)-(13) compositionally, the hearer, who is unfamiliar with the idioms, decodes the concepts encoded by the constituents in the strings and processes some of the accompanying information that is activated. Some of the encyclopaedic information associated with the concepts (e.g. WATER, BRAIN) might be highly salient in processing the string literally in this particular context, while other elements of it might not be relevant and thus not considered (e.g. the property that water is composed of H_2O). If these properties were accessed, they would be quickly suppressed.

At some point in processing the syntactic composition of word meanings in (10)-(13), the hearer realises that the meaning linguistically encoded and the meaning communicated by the speaker's use of the string differ. Given the assumption that the speaker is being optimally relevant, he sets up a conceptual label which in (10) would be of the sort "[TO EAT ONE'S BRAIN], whatever the speaker means by that". The whole string is considered to encode an unfamiliar concept and the hearer's task is to assign some content to it in order to arrive at the proposition expressed by the speaker. In fulfilling this goal, he is guided by the relevance-theoretic comprehension procedure. Thus, following a path of least effort in computing cognitive effects, he starts considering in order of accessibility, possible hypotheses about the content of this attributive ad hoc concept he has created until his expectations of relevance are satisfied, at which point he stops.

The possible sources of hypotheses might include assumptions and implications that arise from the processing of the utterance (e.g. one cannot change the past). Furthermore, this may also include assumptions and implications that arise from the encyclopaedic entries of the concepts linguistically encoded by the idiom string. Thus, the hearer in (10) may access the encoded concept BRAIN as a starting point for inference. Following a path of least effort, he starts considering some of its logical and encyclopaedic properties in order of accessibility (e.g. the brain is used to think, it can store memories etc.). Since only highly activated properties that contribute to cognitive effects are considered, less activated properties (e.g. the brain controls body movements, it is divided into left and right hemispheres etc.) are probably never accessed. This information is adjusted to that obtained along similar lines from other concepts in the string (e.g. by loosening EAT) and with relevant information derived from background knowledge until the hearer's expectations of relevance are satisfied.

This sort of account shows that the processing of idioms does not require any special abilities or mechanisms not employed quite generally in natural language understanding. In fact, it follows similar lines to the comprehension of cases of loose use presented in section 4. That is, the encoded material is used together with background knowledge as a starting point for pragmatic inference. However, unlike

the cases of loose use and nominal metaphors presented in this paper, idioms are complex structures (usually with VP form) which contain more than one content word. Thus, acknowledging the role of individual constituent word meanings (and of background knowledge) in idiom understanding still leaves us with quite a disintegrated picture of the phrasal concept that the speaker intended. A weak point shared by some current accounts is that they do not offer an adequate analysis of how the meaning of the idiom emerges from this fragmented array (Cacciari & Tabossi 1989).

This issue is not peculiar to idioms but common to other complex linguistic forms encoding a single holistic representation (e.g. compounds and certain non-idiomatic conventionalised word combinations). In order to assign content to the ad hoc concept, the hearer needs to form a complex representation where information arising from the concepts encoded and from context is integrated. That is, a higher level of representation is required at the phrasal level. This not only motivates the creation of the ad hoc concept at that very level but also its later storage. My view is, then, that the conceptual assumptions and implications arising from the constituents in the string (and context) need to be adjusted to and integrated with inferences obtained by treating the string as a whole. Information from the different sources is processed simultaneously and following considerations of relevance.

Let's now look at example (12). After the literal interpretation has failed, the hearer in (12) constructs an attributive ad hoc concept of the sort "[TO DROWN IN A GLASS OF WATER], whatever the speaker means by that". As a matter of fact, although the output of a previous (rejected) compositional reading did not satisfy the hearer's expectations of relevance, some of the already-processed properties of the encoded concepts - at this moment highly accessible - might be relevant in understanding the non-literal intended meaning. It could even be the case that some of the concepts encoded in the string (e.g. WATER, GLASS) would not contain any other salient properties which would contribute to cognitive effects in the particular context. Consequently, it might not be worthwhile for the hearer to consider them. That is, in making sense of the unfamiliar expression, the hearer might not need to invest extra processing effort at the constituent level. However, extra processing effort at the phrasal level might be essential in order to assign content to the string and to account for conceptual holism. In (12), some assumptions can be quickly derived from the string as a whole but not from any of its constituents individually (e.g. there is not enough water in a glass for a person to drown). This and other assumptions lead to further implications which are considered and adjusted on-line. That is, since the hearer follows a path of least effort, the mutual adjustment of explicit and implicit content can allow him to arrive at a

relevant interpretation without having to explore the encyclopaedic entries of some of the individual encoded concepts (e.g. WATER, GLASS) any further.

In sum, the hearer making sense of an unfamiliar idiom does 'whatever he has to' in order to assign some meaning to the attributive ad hoc concept he has created so as to be able to arrive at the proposition expressed by the speaker. Which information he processes (or processes first) from the potential sources already mentioned follows from considerations of relevance. This process continues until he builds up on-line a particular conceptual representation that satisfies those expectations. In some cases, the individual word meanings do not provide enough information or relevant information worth considering, as in (11)-(12). Still, the phrase acts as a meaningful unit as a whole and motivates the emergence of relevant assumptions (e.g. touching wounds is painful) which could not be derived from any of the constituent words alone.

In the case of completely opaque idioms, neither the individual constituents nor the conceptual representation obtained from processing the idiomatic string compositionally are of any help in reaching the intended meaning, as in (13). In fact, retrieving information from the encyclopaedic entries of the concepts encoded can mislead the hearer. Current 'compositional' approaches give no explanation of how these idioms are acquired and often presume they have to be learned. Since no utterance is absolutely free of context, the account I propose is able to account for how hearers can often assign some content to opaque idioms too. At some point during the comprehension process, the hearer probably takes the encoded material as a starting point of inference but quickly rejects it as a possible source of relevant hypotheses. In fact, the only way to assign some content to the ad hoc concept he has created is by accessing assumptions and implications arising from immediate context and background knowledge. The possible hypotheses are considered until one of them satisfies the hearer's expectations of relevance, at which point he stops processing. If context does not provide enough relevant information, the hearer is unable to assign meaning to the ad hoc concept he has created on-line and, consequently, is unable to arrive at the proposition expressed by the speaker. In this case, communication is not fully successful and he needs to ask for an explicit explanation of the intended meaning.

So far I have argued that the hearer often exploits background knowledge and constituent word meanings (and the way they combine) to assign content to the ad hoc concept he creates to make sense of an unfamiliar idiom string. Accessibility of information has been said to be relevance-guided and context-dependent. I want to consider now a hypothesis coherent with these arguments: word meanings often play a

role in understanding idioms only once a highly accessible interpretation has arisen from context. This hypothesis reflects what I think it is the most common way we acquire idioms in everyday speech (as children, adults and as second language learners). Let's illustrate this with an example.

Suppose the hearer and his friends are watching a soap opera. They all know that Mr. Williams is the only character who knows about the secret marriage of Peter and Janet. In the middle of an argument with Janet's mother, Mr. Williams starts criticising the woman for not knowing her own daughter. At this point, one of the hearer's friends shouts (14).

(14) Oh no, he is going to *spill the beans*!

The hearer is not familiar with the idiomatic expression. The context is quite clear but the string is not very transparent. The clear context allows the hearer to arrive at a potential interpretation 'tell the woman about Janet's wedding'. At this point, he has already realised that the meaning encoded by the string and that communicated by the speaker differ but has not yet found out in which way, if any, they relate to each other. The hearer steps back and tries to map the potential interpretation to the linguistic form *'spill the beans'* in an attempt to find reasons for the hearer's use of this particular string of words. During this process, he probably takes the encoded concept SPILL as a starting point of inference and loosens it to mean something like 'reveal' or 'speak about' in this context. It is unlikely the hearer treats the concept encoded by 'beans' as a case of loose use along the lines we have outlined in this paper. He probably merely retrieves from it the property of being a NP and maybe the property that beans (like secrets) are countable. That is, it can be said to act as a kind of placeholder. The hearer keeps adjusting assumptions and implications arising from context and word meaning on-line until he arrives at an interpretation that satisfies his expectations of relevance. The output of this process provides a relevant interpretation of the idiomatic string, roughly paraphrased as 'tell a secret'. In brief, the first potential hypothesis that comes to the hearer's mind is compared with information accessed from the concepts encoded by the string, which are often loosened accordingly to arrive at the intended meaning.

The reason for spelling out this example is to show that contextual bias and spreading activation often narrow down the interpretive possibilities so that the hearer can arrive at a potentially relevant interpretation of the idiom at an early point during the comprehension process. Hence, it is often only after a highly accessible interpretation has been derived that the hearer tries to see how its meaning relates to

the linguistic form used by the speaker. Unlike in the case of the process of trying to find the meaning of a novel lexical item, the encyclopaedic entries of the concepts encoded by an idiom might contain relevant information which is considered in assigning meaning to the string. As section 4 showed, this last process is not peculiar to idioms but applies more generally to everyday language understanding which often includes the processing of loose use, metaphor, hyperbole and other instances of figurative speech. In all these cases, retrieval of relevant information from encoded material - often via loosening - usually provides a reason for the speaker's choice of words.

To sum up and conclude this section, all unfamiliar idiomatic strings, whatever their degree of compositionality, are understood by following the same relevance-theoretic comprehension procedure. The content assigned to the newly created concept is obtained from integrating information, derived in its order of accessibility, from background knowledge, the concepts underlying constituent word meanings individually and the assumptions and implications arising from combining them. Explicit and implicit content available at the time of the utterance is mutually adjusted until the hearer arrives at an interpretation that satisfies his expectations of relevance. The pragmatic development of the propositional form of the utterance would include in all these cases a process of ad hoc concept construction. The output of this development would be taken to be the explicature of the speaker's utterance which in the case of (10) would be roughly as in (15):

(15) The speaker is not going to [EAT* [HER BRAIN*]] at time t for what .....

The account presented here is compatible with current views on idioms which argue that the relation between the linguistic meaning resulting from interpreting the string literally and the (idiomatic) meaning communicated is often not completely arbitrary. I believe that, at least in the case of unfamiliar idioms, the relation is between two conceptual representations: the representation obtained from computational processing and the intended (idiomatic) one. The degree to which the representations relate to each other is often accounted in terms of the degree to which the individual word meanings in the strings contribute to the overall idiomatic meaning, the so-called degree of compositionality. This section has acknowledged the (partial) contribution of word meaning in idiom understanding but has also shown the pragmatic constraints imposed on this contribution. Furthermore, unlike other accounts, the approach presented in this paper is able to account for non-compositional strings. That is, it illustrates how all types of unfamiliar idioms (from the highly compositional to the

completely opaque) are understood via the same cognitive mechanisms and comprehension procedure.

Plenty of experimental findings support the hypothesis on the acquisition of idioms made in this section. Constituent word meaning is naturally explored in making sense of unfamiliar idioms (Cacciari 1993; Levorato 1993). Subjects often take little effort in understanding so-called 'compositional' idioms as opposed to non-compositional strings especially in the absence of relevant context (Gibbs 1991). Moreover, Cacciari & Levorato (1989) found that young children unfamiliar with the idiom that would fit a text biasing the idiomatic interpretation often completed the text with a figurative expression they invented naturally. For example, one of these children reported that after a while, the shy child in the text, who was in his first day at school, 'broke his fear'. This interesting finding not only suggests that children explore contextual cues after a certain age (Cacciari & Levorato 1988), or that the development of a child's figurative competence runs in parallel to the development of more general cognitive abilities (Levorato 1993). It also suggests that these cognitive abilities are not biased towards literalness but are relevance driven.

5.3 How familiar idioms are mentally represented

5.3.0 The reason for spelling out idiom acquisition in some detail is that I believe the manner in which we acquire idioms determines in important ways how we represent, process and use them thereafter. The concept resulting from the initial attempt at understanding an idiom will probably not yet be a complete concept. In (10), the phrasal concept resulting from the interpretation process would be something like (16).

(16) "[[TO EAT* [ONE'S BRAIN*]]".

The quotation marks indicate the attributive nature of the concept, the attribution being to the speaker. With the passing of time, this initial source (the speaker) will be forgotten and the concept might well remain attributive in a weaker sense (e.g. "X, as people say"). This shows that unlike the concept often resulting from understanding loose talk, the (partially understood) concept resulting from understanding an idiom might not be simply a one-off. It often becomes a stable element in the hearer's lexicon, especially if the hearer is a child acquiring language. The inner brackets are used to indicate the existence of internal (syntactic and semantic) structure. The outer brackets show everything forms a single (complex) concept with a meaning that goes beyond the meaning assigned to its parts. To illustrate this with a concept familiar to

the reader, let's look at how the idiom *spill the beans* might be represented in our mental lexicon:

(17) *Conceptual address:* [[SPILL* [THE BEANS']][3]
Linguistic entry: V NP; /phonetic form/
Logical entry: one-way inferential links to other concepts REVEAL, DIVULGE
Encyclopaedic entry: particular schema (what is revealed, who performs the action, consequences of the action on people etc.), mental image etc.

Although the issue of how idioms are represented in the mind is a polemic one, I want to suggest that idioms, at least most idioms, are stored as complex structured concepts with three kinds of information: linguistic, logical and encyclopaedic. The linguistic entry includes information about the syntactic and phonological properties of the idiom. That is, it tells how the idiom is pronounced and how it is internally structured syntactically (e.g. usually a VP). The logical entry consists of a set of one-way logical links to other concepts, such as DIVULGE and/or REVEAL. The encyclopaedic entry consists of different types of information that arise gradually and as a result of on-going exposure to the string. This entry is quite incomplete after the first few hearings. In fact, the development of the concept underlying the idiom consists considerably in filling in information in this entry.

5.3.1 The logical entry. Idioms encode complex conceptual representations which in no way equate to literal paraphrases. One of the main problems with some standard views of idioms is that the logical entry is mistaken with the overall idiomatic meaning or used as a definition of its meaning (Makkai 1972). I depart from this view. The information contained in this entry does not exhaust the idiomatic meaning but merely points to logical relations the idiom has with other existing concepts (e.g. DIE, REVEAL). That is, *kick the bucket* does not mean just DIE although it is logically related to this concept. This is only a one-way relation since it is probably true to say that everybody who *kicks the bucket* dies but one cannot say that every person that dies *kicks the bucket*. As suggested before, people often restrict the use of this idiom to cases in

[3] * indicates a development from the encoded concept SPILL, here a case of loose use. ' stands for some kind of placeholder.

which people die of sudden natural deaths. People who die by execution, cancer or murder are not said to *kick the bucket*. Just to make sure: none of this information about idiom use is contained under the logical entry. The information in this entry is restricted to logical links, such as entailment, with other concepts.

5.3.2 The encyclopaedic entry. This includes knowledge about the property denoted by the idiom which we have acquired through ongoing exposure to its use. I believe an idiom often includes information in the form of ready-made schemas or provides direct links to them. For instance, the encyclopaedic entry of the concept underlying the expression *spill the beans* may include a schema/frame about this kind of secret-revealing behaviour. This would include information about the manner in which the action is performed, the entities involved (e.g. agent, victim), their attitudes, consequences of the action and so on. This entry may include personal and cultural information about stereotypical situations of 'bean spilling' (e.g. a criminal under torture, or a little girl chattering, etc). It probably includes mental images of such scenes too.

All this information is unlikely to be stored as a disorganised bunch. It is probably internally structured so that some information is accessed faster almost every time we use or understand the expression. Which information is accessed (and/or accessed first), follows from considerations of relevance. Issues of familiarity, frequency of use, contextual bias and spreading activation, among others, may allow an earlier activation of highly relevant features. For instance, the concept underlying an idiom may have a huge associated encyclopaedic entry with different sub-entries each one representing a prototypical situation in which the idiom is often used. Understanding an idiom (e.g. *spill the beans*) in a specific context may involve accessing one of these stereotypical entries (e.g. about criminals talking about their crimes). Other information, highly salient in some other contexts (e.g. about other stereotypical uses), may be never considered and even inhibited. The activation of a particular schema on-line facilitates the processing of longer figurative discourse, as in (18).

(18) The witness *spilt the beans* in court, one after the other, nourishing the jury...

Furthermore, this view is supported by experimental findings which show idioms with very similar meaning (e.g. *hit the roof* and *blow your stack*) can be used interchangeably in some contexts but not in others (Gibbs 1992). In fact, the whole idea of having an encyclopaedic entry containing all these types of structured information is supported by experimental findings which show that idiom reading rates

are affected by degrees of familiarity and frequency and by context (Cronk & Sweigert 1992; Levorato & Cacciari 1992). These factors may not only allow an earlier recognition of the string but also facilitate the retrieval of adequate information from the encyclopaedic entry of the idiom. Also, in understanding idioms, stored mental images might offer a quick way to derive contextual implications (and other cognitive effects) and so, they might be accessed whenever necessary[4]. It would be quite interesting to test, for instance, which information contained in the idiom entries arises in processing slips of the tongue that lead to idiom blends. That is, to test, for instance, what properties and images would arise from hearing expressions, such as *button your tongue* or *weight your mouth.*

5.3.3 The linguistic entry and idiom variants. Idioms are pervasive in everyday speech. We understand them easily and use them spontaneously in conversation. It was in part the ease with which we understand them, that led traditional scholars to view them as lexical items. Unfortunately for them, idiom turned out to be much more complex entities, at least regarding their syntactic behaviour. In fact, accounting for syntactic transformations within a theory of grammar that views idioms as inserted at X^o proved to be a great nightmare. In the last decades, as has been shown, idiomaticity has been seen as a semantic rather than a syntactic phenomenon and so as falling outside the scope of syntax (Nunberg et al. 1994; Ackema & Neeleman 2000). Approaches that favour the split between syntax and semantics as two different modular systems have been developed. They have argued that since the syntactic parser processes only syntactic information, ignoring semantic properties of the idiom, some transformations are possible (Flores d'Arcais 1993). This and other interesting proposals (Jackendoff 1995; Peterson & Burgess 1993) have been presented to account for the different forms an idiom may take without losing its figurative meaning, as in (2) and (4). This line of research seems to show that the processing of idiomatic and literal strings is quite indistinguishable in terms of syntactic representations and that in understanding idioms, syntactic parsing takes place as normal. This view is compatible with the idea I have been defending in the essay that considers idioms to encode phrasal concepts with internal structure. The linguistic entry of the concept encoded by an idiom contains syntactic features of the string (e.g. [V [NP]]) which are processed by the parser. Thus, idioms should not present a major problem to theories of grammar, which should be able to deal with them without

[4] For constraints on the role of imagery in figurative language understanding (proverbs and metaphor), see Riechmann & Coste 1980.

resorting to stipulated ad hoc rules. If the hypotheses presented here are true, an idiom with the form [V [NP]], such as *spill the beans*, should allow internal modification, as in (19) and (20).

(19) *Spill all the beans*
(20) He *spilt some interesting beans*

The issue of idiom variants has been widely considered since not all idioms allow all kinds of modification. Some scholars argue that syntactic constraints on idioms have an historical basis (Cutler 1982), are hierarchically structured (Fraser 1970), or are semantic in nature (Nunberg et. al. 1994). None of these accounts present cognitive reasons to tell apart acceptable from unacceptable variants, though. Questions like this may arise at this point: if (21) and (22) are syntactically possible why are they ruled out as variants of the original idioms?

(21) *The *cat sleeping there was let out of that bag* on the table
(22) **The bucket was kicked* by Peter last summer.

To understand and process an idiom, or a variant of an idiom, one has to retrieve the form and meaning of that idiom from memory. Syntactic variations of the lexicalised form of the idiom may be allowed as long as the conceptual representation of the idiom is easily retrieved from the modified form. According to Relevance Theory, the hearer takes the first interpretation that satisfies his expectations of relevance to be the one the speaker intended. In some cases, recognising the original form of the idiom involves the investment of much more processing effort than is involved in computing the string literally, as in (21)-(22). On the assumption that a speaker aiming at optimal relevance would make the intended interpretation the most accessible one, the hearer of (21)-(22) would thus take the literal interpretation as the intended one and communication would not be successful.

Furthermore, a speaker aiming at optimal relevance should not alter the original form of the idiom unless she wants to communicate something other than, or additional to, what she would communicate by using the original form. That is, idiom variants should be pragmatically motivated and this motivation is measured in terms of cognitive effects. Understanding an idiom variant requires the investment of extra processing effort on the side of the hearer. Hence, for the utterance to achieve optimal relevance, extra (or different) effects not retrievable from the original form should reward this effort. This is clearly the case with (19) and (20), where some cognitive

effects (concerning the extent and nature of the revelation) are achieved which are not attainable by the use of the standard form. In (21)-(22), however, there isn't any apparent reason why the speaker would choose to use these particular forms. The next section illustrates the way we understand idiom variants in more detail.

5.4 Relevance Theory and idiom variants

Once we have acquired a good grasp of the concept underlying a particular idiom, we can produce and understand variations of that idiom. However, as the previous section indicated, the concept communicated by the use of the idiom variant may differ from the original idiom in only some ways:

(23) *Jenny spilled the tuna
(24) Tom came in and poured the beans!
(25) The judge didn't believe any of the beans the criminal spilt under torture.
(26) * It cost me three fingers and an ear
(27) It cost me two arms and three legs

Providing the speaker in each of (23)-(27) is being optimally relevant, she would have meant something different from the meaning that is recovered by the standard form. Unlike original idioms, the meanings of idiom variants cannot be directly retrieved from the hearer's lexicon so some degree of linguistic processing is required. In order to account for the extra processing effort that is involved, idiom variants need to be pragmatically motivated. Unlike previous account of idioms, this paper attempts to spell out what is meant by 'pragmatic motivation' and what cognitive mechanisms regulate our understanding of idioms and their variants.

In processing (24) the hearer probably retrieves the familiar concept [SPILL* [THE BEANS']] only after he arrives at the word '*beans'*. The contextual cues biasing idiomatic meaning and the similarity of form of the novel string with the original idiom trigger the concept [SPILL* [THE BEANS']] from the hearer's mental lexicon. With the original idiom meaning highly activated in his mind, the hearer constructs an attributive ad hoc concept '"**[** POUR [THE BEANS]]", whatever the speaker means by that' which functions as a placeholder in understanding the utterance.

Following a path of least effort, he considers, in order of accessibility, possible hypotheses about the content of the ad hoc concept he has created to make sense of the speaker's use of that particular string. Some of the logical and encyclopaedic properties of the concept POUR are considered and some highly activated assumptions

(e.g. about the intentionality of the behaviour, its meanness and disloyalty) are accessed and lead to the derivation of contextual implications. This information is integrated, with the information obtained from the concept encoded by the original form of the idiom [SPILL* [THE BEANS']]. That is, the hearer may take the meaning encoded by the original idiom - which is highly accessible - and modify it slightly with information arising from the concept POUR until his expectations of relevance are satisfied. Elements of information from both concepts [SPILL* [THE BEANS']] and POUR are relevant as long as they end up forming another concept which is taken to be the one the speaker intended by her use of the expression *'pour the beans'*. This process of conceptual blending and integration of content continues until the hearer arrives at an interpretation that satisfies his expectations of relevance, at which point he stops. The output of this process is the attributive concept "[POUR* [THE BEANS']" which he has created on the fly and which is taken to be a constituent of the proposition expressed and communicated by the speaker, roughly as in (28).

(28) Tom came in to place p at time t and then Tom [POUR* [THE BEANS']].

It follows from the account I propose that the meaning communicated by the speaker's use of the idiomatic variant *pour the beans* is only recognised and understood because the concept [SPILL* [THE BEANS']] is listed in the hearer's mental lexicon and taken as a point of reference. Furthermore, unlike other approaches to idioms on the market, Relevance Theory offers a cognitive explanation for, and an accurate distinction between, acceptable and unacceptable idiom variants. A speaker aiming at optimal relevance does not put the hearer to unnecessary processing effort. Ad hoc concept construction is costly and needs to be pragmatically motivated. Hence, the extra processing effort that the departure from the original form (e.g. *'spill the beans'*) may require needs to be rewarded with extra (or different) effects not achievable by the original form (e.g. implications about intentionality, meanness etc.) or communication would not be completely successful.

Interpreting (23) and (26) would not satisfy the hearer's expectations of relevance. On the one hand, the lexical entry for TUNA does not provide the hearer with relevant assumptions that processed in this context would lead to extra (or different) effects. On the other hand, the multiple lexical substitution in (26) may trigger the concept encoded by the use of the idiom but does not provide extra cognitive effects to motivate the substitution. In these cases, the processing effort invested in ad hoc concept construction and information searching is not rewarded (at least unless a very

specific and complex context is provided). In neither case, then, would communication be fully successful.

Glucksberg (1993, 2001) argues against models of the comprehension of idiom variants which involve the following steps:

(29) *1. Recognize the idiom as a variant of a conventional idiom.*
2. Retrieve the meaning of the original idiom.
3. Identify the constituent meanings of both the variant and originalidioms.
4. Compare the constituent meanings of the two idiom forms.
5. Identify the relation(s) between those meanings, e.g., verb tense,quantification, negation, etc.
6. On the basis of this relation, infer the relation between the meanings of the original and their variants.

(from Glucksberg 2001)

If, in understanding an idiom variant, the hearer has to retrieve the meaning of the original idiom, process the string linguistically and finally compare both representations, understanding idiom variants should take longer than both understanding familiar idioms and understanding literal strings of the same length. However, experimental findings demonstrate that subjects do not take longer to understand idiom variants than to understand literal strings of the same length (McGlone et. al. 1994). The account I have proposed in this section seems, at least at first sight, to belong to the groups of accounts that argue in favour of a comprehension of idiom variants that requires the six steps in (29). A closer look will show that this is not necessarily the case.

Idiom variants have been said to be understood, like any other piece of language, by following a path of least effort. Although individual word meanings contribute to the comprehension process, this contribution is strongly constrained. On the one hand, the original idiom is retrieved spontaneously at VP level and the constituent word meanings are often not accessed (though they may be activated). Moreover, the exploration of the logical and encyclopaedic entries of the concepts encoded by the use of the variant is always kept to a minimum (e.g. as shown with *'pour'* in *pour the beans*). In fact, this is a local rather than a global process since it is only the encyclopaedic entries of the concept encoded by *'pour'* in *pour the beans*, or *'single'* in *don't spill a single bean* that are searched on-line. The information obtained from these concepts is quickly accessed and integrated with the meaning of the original

idiom (retrieved automatically) into the ad hoc concept that has been created on the fly. In sum, steps 3-6 can be reduced to a single fast process of conceptual integration. The processes of ad hoc concept formation, computation and conceptual integration (which are highly pragmatically constrained) are not peculiar to the comprehension of idioms or idiom variants but are common to everyday language understanding. Hence, under the account proposed in this paper, there is no apparent reason why understanding an idiom variant should involve more effort or take longer than understanding a literal string of the same length.

Glucksberg (Glucksberg 1993, 2001) proposes an alternative model of the processing of idiom and idiom variants based on two basic ideas. Idioms are processed linguistically like any other string of words and some of them develop phrase-induced polysemy. That is, the individual constituents of some idioms, such as *spill the beans*, are said to acquire an extra (figurative) sense which is selected in on-line comprehension so that expressions of the sort *don't spill a single bean* are processed in a word by word fashion. That is, idiom variants of compositional idioms are understood via ordinary linguistic processing in which the more adequate (figurative) senses are retrieved and processed. Both the arguments and the findings presented (McGlone et al. 1994) seem to be able to deal with idioms which have undergone phrase-induced polysemy, as in (30)-(31). However, trying to extend this analysis to variants which involve lexical substitution, as in (32)-(33), is much less convincing.

(30) *The beans were finally spilled*
(31) Don't look at me, *I didn't spill a single bean*
(32) Ok now, *I found my train of thought*
(33) *He poured the beans*

Understanding such idiom variants, which are mainly the result of lexical substitution, as in (32)-(33), requires the original idiom to be 'called to mind'. This step, number 2 in (29), is automatic. The problem lies with whether this activated meaning is compared with the meaning retrieved from linguistic processing. If it is, the hearer follows the steps in (29) and so the account is inconsistent with experimental findings. If it isn't, an account of idiom comprehension that draws on the important notion of conceptual holism needs to be presented. The phrase-induce polysemy hypothesis seems to have avoided the former alternative but at the expense of not capturing the latter.

It is quite unlikely that a word like *'bean'* will encode multiple figurative senses for each of the idioms containing this word (e.g. *not to have a bean, to know how many*

beans make five, *spill the beans*, *not to give a bean* etc.). Still, the account defended in this paper is not at odds with the view that the constituents of some idioms may develop an extra (figurative) sense. However, it does point out that understanding an idiom variant goes beyond retrieving these individual meanings on-line. In fact, the point of building up an ad hoc concept on-line to make sense of the novel string is to arrive at the proposition explicitly communicated by the speaker and so to warrant certain implicatures of the utterance. If the idiomatic meaning that is being communicated is not represented holistically as forming a conceptual representation, it is difficult to see how the hearer arrives at the propositioned expressed. Moreover, even if he does, it is difficult to see how this proposition and the implicatures communicated are going to differ from the ones derived from processing a literal paraphrase (e.g. 'he didn't reveal a single secret'). Another problem with the phrase-induced polysemy account, as with the other approaches in the literature, is that they lack a cognitive principle to explain why hearers recognise *pour the beans* and not, for instance, *hurt the beans* as a variant of the idiom *spill the beans*. If idiom variants are processed like any other string of words, retrieving the figurative sense of *beans* on-line should occur in both cases.

In sum, this section has shown how the common use of idiom variants in everyday speech provides evidence of the flexibility and creativity of our minds. It has also illustrated that they are understood naturally and usually almost effortless. Moreover, the extra effort that may be invested in processing them is rewarded with extra (or different) cognitive effects. In fact, the very existence of idiom variants and the way they are processed favours the account of idiom representation defended in this paper in which idioms encode complex concepts with internal structure. The concept [SPILL* [THE BEANS']] is syntactically structured as [V [NP]] and semantically integrated, at least in part, as a case of a loose use ([SPILL*]) and a kind of placeholder ([THE BEANS']). It is because the concept SPILL* allows the retrieval of specific idiomatic content (e.g. 'divulge', 'tell') and (if necessary) the triggering of the literal (encoded) concept SPILL that some modifications (POUR*, SPIT*, VOMIT*, DROP*) are not only possible but fast to process. That is, the concepts POUR* and SPILL*, for instance, may share many of their logical and encyclopaedic properties. They might only differ in that the latter lacks the property of intentionality highly accessible from the former. Consequently, in comprehending the concept encoded by the use of *pour the beans*, a minimal degree of effort is required and so its meaning is easily and quickly understood on-line.

5.5 Processing familiar idioms

In section 5.3.3, the view that a syntactic structure can be derived without the literal interpretation being computed was briefly discussed (Flores d'Arcais 1993). According to that view, since the syntactic parser takes only syntactic information, there is no apparent reason why the output of this process would be any sort of representation of the meaning of the idiomatic string. In fact, at this point, the question of whether idiomatic processing is essentially literal, figurative, or both, needs to be reconsidered. On the one hand, it is very unlikely that processing an idiomatic expression involves a shift of processing mode, either from literal to figurative or the other way round. On the other hand, there is a need to weaken the claim that parallel processing takes place to the idea that parallel processing takes place locally rather than globally (Recanati 1995) or that it just involves the simultaneous activation of different meanings on-line.

This paper argues in favour of an account of idioms which is not committed to the existence of different processing modes in language understanding. It pursues the view that speakers do not aim at literalness (Bobrow & Bell 1979) or at figurativeness (Gibbs 1994) but at optimal relevance (Sperber & Wilson 1986). The comprehension of idioms is achieved through just the same processing mechanisms as the comprehension of non-idiom strings. That is, in understanding an idiom, as in understanding any other instance of language, the hearer is guided by the relevance-theoretic comprehension procedure. Since utterance processing is not optional, both the concepts underlying the individual constituents in the string and the concept underlying the idiom as a holistic unit are activated as the idiom is heard. Precisely which of this activated information is accessed follows from considerations of relevance.

At least in principle, we seem to be able to process idioms in two fashions: bottom-up (word by word analysis) or top-down (where idioms are retrieved at VP-level). However, since full linguistic analysis and computation takes more time and effort than retrieving a meaning from the mental lexicon, the top-down strategy would be favoured whenever possible. Furthermore, if some word-by-word analysis is required, it is kept to a minimum. In understanding an unfamiliar idiom, the hearer cannot retrieve any pre-existing figurative concept and is forced to rely on a word-by-word analysis of the string. In understanding an idiom variant, neither retrieval nor computation alone is sufficient. Both retrieval of the original form and meaning of the idiom as well as *some* linguistic processing are often necessary. In understanding idiom string puns or jokes, in which both the figurative and the literal meanings of the idiom are intended, both processing strategies need to be exploited. The hearer would spontaneously retrieve the encoded figurative meaning but, in order to arrive at the intended meaning and effects, he would also need to process the string in a word-by-

word (literal) fashion. In this case, extra cognitive (e.g. humorous) effects reward the extra effort invested. All in all, the most common way a hearer understands a familiar idiom in everyday speech is by direct retrieval of the structured concept, which is the encoded meaning of the idiom, from his mental lexicon. That is, bottom–up analysis is costly and is avoided whenever possible.

At this point, this account makes some predictions. On the one hand, in a context biased towards the figurative meaning of the idiom, this meaning is probably retrieved as a VP concept as soon as the first word in the string is heard. For example, in a context about the revelation of a secret, the concept [SPILL* [THE BEANS']] is probably retrieved as soon as the word '*spill*' is heard. On the other hand, in the absence of a relevant (figuratively biased) context, retrieval of idiom meaning may be delayed and computation of the first few words in the string might occur before the idiom is retrieved at VP. In this case, the conceptual representation underlying the idiom might be retrieved only after the second content word (e.g. *'beans'* in *spill the beans*) is heard. These predictions are supported by experimental findings which demonstrate that retrieval of the idiom meaning is context-dependent and can occur at different points in processing the string (Tabossi & Zardon 1995).

Based on these findings, the configuration hypothesis suggests that idiomatic meaning is not retrieved as soon as the first word in the string is heard (Swinney & Cutler 1979) but as soon as the 'idiomatic key' is encountered. Unlike the configuration hypothesis, the relevance-theoretic account developed in this paper provides a cognitive explanation for why the point of idiomatic recognition varies across utterances. A hearer following a path of least effort would retrieve the idiomatic meaning at VP as soon as possible, so as to avoid the extra processing effort that word-by-word analysis involves. Once there is enough information available to make the idiomatic meaning the most accessible one, this meaning is automatically retrieved and processed in context. If the result of this process satisfies his expectation of relevance, the hearer takes the figurative interpretation of the string as the one the speaker intended and stops processing.

Given that retrieval of idiom meaning is context-dependent, we would predict that contextual bias, spreading activation and familiarity with the string affects the point of idiom retrieval and reading rates. This prediction is not unsupported (Cronk et. al. 1992). In fact, one of the main problems with certain experiments in the literature, which appear to present counterexamples to the account developed here, is that they are based on no-context scenarios (Swinney & Cutler 1979; Gibbs et. al. 1989). However, since utterances are never context-free, I believe these experiments do not

reflect the natural way we understand and process idioms in on-line comprehension and thus cannot rule out the hypotheses presented here.

This paper has, among other things, analysed the role of word meaning in understanding unfamiliar idioms and idiom variants. The analysis supports current accounts of idioms that claim the individual constituents of most idioms contribute to the overall idiomatic meaning. Furthermore, it improves on those accounts by spelling out in some detail how, and to what extent, they contribute to idiom understanding. But do constituent word meanings contribute to the way we understand *familiar* idioms? And if so, to what extent? This section shows that the answers to these questions are to be found in a hypothesis which follows directly from principles of human cognition: the contribution of word meaning in on-line comprehension is constrained by the search for an optimally relevant interpretation.

All in all, although highly criticised, traditional accounts of idioms prove to be right in a certain sense: in understanding a familiar idiom one needs to retrieve its meaning as a chunk from the lexicon. It is true that some computation prior to the retrieval of the idiom may be involved but it is kept to a minimum. The information contained in the encyclopaedic entries of the concepts encoded by the string (and the assumptions arising from context) may be exploited on-line. However, this only occurs at certain points (e.g. before the idiomatic key is encountered) during processing and in some but not all circumstances (e.g. in the absence of a figuratively biased context). Which properties of the encoded concepts are considered and the point at which they are processed has been shown repeatedly to follow from considerations of relevance.

Unlike the configuration hypothesis, which argues in favour of a distributed representation (Cacciari & Tabossi 1989), the account presented in this paper captures the conceptual holism of an idiom and its role in representing and processing the string. Furthermore, the relevance-theoretic account of idioms presented here is grounded in the belief that a minimum-processing-effort procedure favours retrieval of the idiom at VP-level as opposed to computation of the constituents in the string. The literal meanings of the individual constituents in the familiar idiom, despite a degree of compositionality, are often not processed, though they may be activated. That is, it does not deny the fact that word meanings are activated and may be accessed in comprehension (Cacciari 1993; Cacciari & Glucksberg 1993) but recognises that computation is costly and should be avoided whenever possible. The hearer decodes the string and often arrives at the intended idiomatic meaning without deriving the literal interpretation of the expression. This also explains why we often do not realise that idioms may have a literal reading too. This account is congruent with the findings that show subjects do not take longer to understand idioms than literal strings (Ortony

et. al. 1980: Swinney & Cutler 1979). It is also compatible with the idea that idioms do not form a homogeneous class (Nunberg 1994; Cacciari & Glucksberg 1991). However, it argues that differences among idioms do not affect the comprehension process unless the idiom is unfamiliar to the hearer or a novel use of a familiar one (or presented in an unnatural, no-context experimental scenario).

6 Revisiting views of idiom representation and processing

This essay has presented the following different views on how idioms are mentally represented:

a) Idioms are represented as lexical items in an idiom lexicon different from the normal mental lexicon. (Idiom list hypothesis)
b) Idioms are represented as lexical items (with no internal structure) in the mental lexicon. (Lexical representation hypothesis and direct access hypothesis)
c)Idioms do not need to be represented independently in the mind. They are understood via pre-existing conceptual metaphor schemes. (Conceptual metaphor hypothesis)
d) Many idioms have a distributed representation. Their meaning is distributed along their parts and constructed via multiple selection of figurative senses on-line. Idioms are also stored in memory not as complex concepts but as memorised strings, which allows the individual parts to be recognised as a configuration at some point. (Configuration hypothesis)
e) Idioms are represented as structured phrasal concepts with three different entries (logical, encyclopaedic, linguistic), each with its own format. (Relevance-theoretic hypothesis)

These different hypotheses about idiom representation imply different modes of processing:

Literal first hypothesis:
Idiomatic meaning is retrieved after the literal interpretation has been considered and rejected. Position a) (idiom list hypothesis).

Simultaneous hypothesis:

Literal meaning is computed at the same time as the idiomatic meaning is processed. Position b) (lexical representation hypothesis). Literal meaning is computed until the idiomatic key is encountered, at which point both figurative and literal processing run in parallel. Position d) (configuration hypothesis).

Figurative first hypothesis:
Idiomatic meaning is retrieved directly. Positions b) (direct access hypothesis) & c) (conceptual metaphor hypothesis).

Path of least effort hypothesis:
Idiomatic meaning is retrieved following considerations of relevance. Position e) (relevance-theoretic hypothesis)

In looking at the advantages and disadvantages of other accounts in section 3, I pointed out certain goals an adequate account of idioms should fulfil. Although very interesting proposals have been presented in the literature on idioms, none of them fulfils each and every one of these goals. It is time to check whether the relevance-theoretic account I have developed *fits this bill*:

1) It should account for the behaviour of idioms as larger-than-word units. It should account for idiom variants (syntactic and semantic) without resorting to stipulated rules.

In the relevance-theoretic account of idioms I have developed, the mental representation of idioms as concepts with internal structure allows the idiom to enjoy a certain degree of syntactic and semantic flexibility. Unlike other accounts, this flexibility is not unconstrained. Strong pragmatic principles grounded in the nature of human cognition operate to tell apart acceptable from unacceptable variants.

2) It should account for the behaviour of idioms as units, for conceptual integrity and holism, and for the idea that idiomatic meaning does not equate with any literal paraphrase.

In the account I presented, the concept underlying the idiom encodes a complex conceptual representation at the phrasal level with three different entries: linguistic, logical and encyclopaedic. Unlike traditional models, the logical entry is not taken to exhaust idiomatic meaning. Unlike the configuration hypothesis, idiomatic meaning is

always holistic. Idioms encode complex conceptual representations, which contain logical and encyclopaedic information that gives quick access to other concepts, schemas and mental images among other things.

3) It should account for idiom understanding regarding all idiom types (from the highly compositional to the completely opaque). It should explain the role of word meaning and context.

In my account, all idiom types, despite their degree of compositionality, are acquired and processed by the same cognitive mechanisms and comprehension procedure. Since retrieving the idiomatic meaning from memory is often faster and cheaper than computing the string literally, computation of the phrase from the syntactic composition of word meanings would be avoided whenever possible. In the case of familiar idioms, the hearer decodes the string and retrieves its idiomatic meaning without having to compute the (whole) string literally. In the case of unfamiliar idioms and idiom variants, the meaning communicated by the speaker cannot be directly retrieved from the hearer's lexicon. Thus, understanding these expressions often requires the exploitation of encyclopaedic entries of encoded concepts and of other conceptual assumptions in order to assign some content to the ad hoc concept. Furthermore, since this process is strongly constrained by considerations of relevance, the easier it is for the hearer to access the intended information, the faster he will get to the intended meaning. This view coheres with current accounts of idioms that claim idiomatic meaning is often recovered from the meaning of the individual idiom constituents. However, although constituent word meanings (and context) may play a role in the recovery of the overall idiomatic meaning, the account presented in this paper has shown that their contribution in on-line comprehension is quite constrained. The information contained in the encyclopaedic entries of the encoded concepts (and the assumptions arising from context) may be exploited by the hearer on-line but only at certain points during processing and in some but not all circumstances. Which properties are considered and when they are processed has been shown to follow from considerations of relevance.

7 Conclusion: creative cognition and communication

Idioms (and idiom variants) are of particular interest to the study of the flexible creative processes of the human mind. We can construct concepts in an ad hoc

fashion in order to fulfil particular communicative/interpretive goals, and our pragmatic inferential abilities are powerful enough to enrich or loosen linguistically encoded conceptual material. Although these abilities are used in everyday language understanding, ad hoc concepts are often one-off and transient, rarely stored in long term memory. This makes idioms of particular interest, since their meaning, which is often originally derived as an ad hoc concept through pragmatic loosening, is stored. Furthermore, it has been proposed that the meaning of most idioms is partly obtained from the concepts encoded in their components. Still, idioms are represented and understood at a higher (phrasal) level, which often triggers images and schemas and which encodes complex conceptual representations with no literal equivalent in natural language.

One of the points in defence of ad hoc concept formation that Sperber & Wilson present is the view that there are many more concepts in our minds than words in our language (Sperber & Wilson 1998). If we look at (8), there is no word in the English language that encodes the concept SQUARE* which is communicated here. However, the human ability to create and understand ad hoc concepts on the fly makes communication of unencoded meaning possible and, in fact, easy. Another 'cheap' way to communicate a variety of thoughts, without having to invent and establish new words for the concepts that make them up, is to combine existing encoded concepts to form a complex conceptual entity with a meaning of its own. Part of that meaning is probably recovered from its constituents. However, the configuration as a whole allows the emergence of properties, assumptions and inferences not retrievable from any of the concepts alone (e.g. the property 'white' in 'peeled apples' or 'courageous' in 'blind lawyer').

Current literature on conceptual combination (Rips 1995; Hampton 1997; Winsniewski 1997), nominal metaphor (Glucksberg & Keysar 1990; Tourangeau & Rips 1991) and conceptual integration and blending (Fauconnier & Turner 1998, forthcoming) explores this phenomenon. This work, together with Barsalou's findings, present promising lines of thought which might allow us to understand better the way we acquire and use idioms. In this paper, employing Sperber & Wilson's framework, I have proposed a novel way of looking at the comprehension of idioms which shares some of their claims. There is still plenty of work to be done and Relevance Theory provides a strong framework within which to pursue research not only on idioms but also, more generally, on the fascinating field of creative cognition.

References

Ackema, P. & A. Neeleman (2000) Competition between syntax and Morphology. In Grimshaw, J., G. Legendre & S. Vikner (eds.). *Optimality-Theoretic Syntax.* Cambridge, MA: MIT Press.

Barsalou, L. W. (1980) A priori determinants of a concept's highly accessible information. Paper presented at the *American Psychological Association Convention*. Montreal.

Barsalou, L. W. (1983) Ad hoc categories. *Memory and Cognition* 11/3: 211-227.

Barsalou, L. W. (1987) The instability of graded structure: implications for the nature of concepts. In Neisser, U. (ed.). *Concepts and Conceptual Development: Ecological and Intellectual Factors in Categorization.* 101-140. New York: Cambridge University Press.

Barsalou, L. W. (1991) Deriving categories to achieve goals. In Bower, G. (ed.). *The Psychology of Learning and Motivation.* 1-64. New York: Harcourt Brace Jovanovick Academic Press Inc.

Bobrow, S. & S. Bell (1973) On catching on to idiomatic expressions. *Memory and Cognition* 1: 343-346.

Cacciari, C. (1993) The place of idioms in a literal and metaphorical world. In Cacciari, C. & P. Tabossi (eds.). *Idioms: Processing, Structure, and Interpretation*. 27-52. Hillsdale, New Jersey: Lawrence Erlbaum.

Cacciari, C. & S. Glucksberg (1991) Understanding idiomatic expressions: the contribution of word meanings. In Simpson, G. B. (ed.). *Understanding Word and Sentence*. 217-240. Amsterdam: Elsevier.

Cacciari, C. & M. C. Levorato (1989) How children understand idioms in discourse. *Journal of Child Language* 16: 387-405.

Cacciari, C. & P. Tabossi (1988) The comprehension of idioms. *Journal of Memory and Language* 2: 668-683.

Carston, R. (1996) Enrichment and loosening: complementary processes in deriving the proposition expressed? *UCL Working Papers in Linguistics* 8: 61-88.

Carston, R. (1998) *Pragmatics and the Explicit/ Implicit Distinction*. UCL PhD thesis.

Carston, R. (forthcoming) *Thoughts and Utterances*. Oxford: Blackwell.

Cronk, B. & W. Schweigert (1992) The comprehension of idioms. The effects of familiarity, literalness and usage. *Applied Psycholinguistics* 13/3:131-146.

Cutler, A. (1982) Idioms: the colder the older. *Linguistic Inquiry* 13: 317-320.

Fauconnier, G. & M. Turner (1998) Conceptual integration networks. *Cognitive Science* 22/2: 133-187.

Fauconnier, G. & M. Turner (forthcoming) *The Way We Think*. Basic Books.

Flores d'Arcais, G. (1993) The comprehension and semantic interpretation of idioms. In Cacciari, C. & P. Tabossi (eds.). *Idioms: Processing, Structure, and Interpretation.* 79-98. Hillsdale, New Jersey: Lawrence Erlbaum.

Fraser, B. (1970) Idioms within transformational grammar. *Foundations of Language* 6/1: 22-42.

Gibbs, R. W. (1980) Spilling the beans on understanding and memory for idioms in conversation. *Memory and Cognition* 8: 449-456.

Gibbs, R. W. (1991) Semantic analyzability in children's understanding of idioms. *Journal of Speech and Hearing Research* 34: 613-620.

Gibbs, R. W. (1992) What do idioms really mean? *Journal of Memory and Language* 31: 485-506.

Gibbs, R. W. (1994) *The Poetics of Mind*. Cambridge: Cambridge University Press.

Gibbs, R. W., Bogdanovich, J., J. Sykes & B. Dale (1997) Metaphor in idiom comprehension. *Journal of Memory and Language* 37: 141-154.

Gibbs, R. W, N. Nayak & C. Cutting (1989) How to kick the bucket and not decompose: analysability and idiom processing. *Journal of Memory and Language* 28: 576-593.

Glucksberg, S. (1993) Idiom meaning and allusional content. In Cacciari, C. & P. Tabossi (eds.). *Idioms: Processing, Structure, and Interpretation.* 3-26. Hillsdale, New Jersey: Lawrence Erlbaum.

Glucksberg, S. (2001) On the fate(s) of literal meanings. Paper presented at *Workshop Towards an Experimental Pragmatics*, Lyons, France.

Glucksberg, S. & B. Keysar (1990) Understanding metaphorical comparisons: beyond similarity. *Psychological Review* 97: 3-18.

Glucksberg, S., M. Brown & M. S. McGlone (1993) Conceptual metaphors are not automatically accessed during idiom comprehension. *Memory and Cognition* 21/5: 711-719.

Glucksberg, S., D. A. Manfredi & M. S. McGlone (1997). Metaphor comprehension: how metaphors create new categories. Ward, T., S. Smith & J. Vaid (eds.). *Creative Thought: An Investigation of Conceptual Structures and Processes*. 327-350. Washington, D.C.: American Psychological Association.

Hampton, J. A. (1997) Emergent attributes in combined concepts. In Ward, T., S. Smith & J. Vaid (eds.). *Creative Thought: An Investigation of Conceptual Structures and Processes*. 83-110. Washington, D.C.: American Psychological Association.

Jackendoff, R. (1995) The boundaries of the lexicon. In Everaert, M., E.J. Van der Linden, A. Schenk & R. Schreuder (eds.). *Idioms: Structural and Psychological Perspectives*. 133-165. New Jersey: Lawrence Erlbaum.

Keysar, B. & B. Bly (1999) Swimming against the current: Do idioms reflect conceptual structure? *Journal of Pragmatics* 31: 1559-1578.

Lakoff, G. & M. Johnson (1980) *Metaphors We Live By.* Chicago: University of Chicago Press.

Levorato, M. C. (1993) The acquisition of idioms and the development of figurative competence. In Cacciari, C. & P. Tabossi. (eds.). *Idioms: Processing, Structure, and Interpretation*. 101-123. Hillsdale, New Jersey: Lawrence Erlbaum.

Levorato, M. C. & C. Cacciari (1992) Children's comprehension and production of idioms: the role of context and familiarity. *Journal of Child Language* 19: 415-433.

Makkai, A. (1972) *Idiom Structure in English.* The Hague: Mouton

Nunberg, G. (1978) *The Pragmatics of Reference.* Indiana University Linguistic Club.

Nunberg, G., I. Sag & T. Wasow (1994) Idioms. *Language* 70/ 3: 491-538.

Ortony, A., R. Schallert, R. Reynolds & S. Antos (1978) Interpreting metaphors and idioms: some effects of context on comprehension. *Journal of Verbal Learning and Verbal Behaviour* 17: 465-477.

Peterson, P. & C. Burgess (1993) Syntactic and semantic processing during idiom comprehension: neurolinguistic and psycholinguistic dissociations. In Cacciari, C. & P. Tabossi. (eds.). *Idioms: Processing, Structure, and Interpretation.* 201-225. Hillsdale, New Jersey: Lawrence Erlbaum.

Recanati, F. (1995) The alleged priority of literal interpretation. *Cognitive Science* 19: 207-232.

Riechmann, P. & E. Coste (1980) Mental imagery and the comprehension of figurative language: Is there a relationship? In Honeck, R. & R. Hoffman (eds.). *Cognition and Figurative Language*. 183-200. Hillsdale, New Jersey: Lawrence Erlbaum.

Rips, L. J. (1995) The current status of research on concept combination. *Mind and Language* 10: 72-104.

Sperber, D. & D. Wilson (1986/1995) *Relevance: Communication and Cognition*. Oxford: Blackwell.
Sperber, D. & D. Wilson (1998) The mapping between the mental and the public lexicon. In Carruthers, P. & J. Boucher (eds.). *Language and Thought*. 184-200. Cambridge: Cambridge University Press.
Swinney, D. & A. Cutler (1979) The access and processing of idiomatic expressions. *Journal of Verbal Learning and Verbal Behaviour* 18: 523-534.
Tabossi, P. & F. Zardon (1995) The activation of idiomatic meaning. In Everaert, M., E.J. Van der Linden, A. Schenk & R. Schreuder (eds.). *Idioms: Structural and Psychological Perspectives*. 273-282. New Jersey: Lawrence Erlbaum.
Tourangeau, R. & L. Rips (1991) Interpreting and evaluating metaphors. *Journal of Memory and Language* 30: 452-472.
Wilson, D. (1995) Is there a maxim of truthfulness? *UCL Working Papers in Linguistics* 7: 197-212.
Wilson, D. & D. Sperber (2000) Truthfulness and Relevance. *UCL Working Papers in Linguistics* 12: 215-254.
Wisniewski, E. J. (1997) Conceptual combination: possibilities and esthetics. In Ward, T., S. Smith & J. Vaid (eds.). *Creative Thought: An Investigation of Conceptual Structures and Processes*. 51-81. Washington, D.C.: American Psychological Association.