Figurative Language Understanding in LCCM Theory

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Abstract

While cognitive linguists have been successful at providing accounts of the stable knowledge structures (conceptual metaphors) that give rise to figurative language, and the conceptual mechanisms that manipulate these knowledge structures (conceptual blending), relatively less effort has been thus far devoted to the nature of the linguistic mechanisms involved in figurative language understanding. This paper presents a theoretical account of figurative language understanding, examining metaphor and metonymy in particular. This account is situated within the Theory of Lexical Concepts and Cognitive Models (LCCM Theory). LCCM Theory (Evans 2006, 2009b) is a cognitively realistic model of lexical representation and semantic compositionality, providing, it is argued, an account of figurative language which complements the 'backstage' cognition perspective of Conceptual Blending Theory. It also integrates the notion of conceptual metaphor within the account provided of figurative language understanding. The paper introduces the key mechanisms involved in figurative language understanding arising from language use. The paper also provides a programmatic account of how conceptual metaphors are integrated with linguistic knowledge in figurative language use. It is argued the present proposals flesh out a key aspect of the conceptual integration perspective promoted by Fauconnier and Turner, with which LCCM Theory is continuous. In part, the paper attempts to advance the prospect of a 'joined up' cognitive linguistic account of figurative language understanding.

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1. Introduction

The cognitive linguistics enterprise has provided an approach to studying human imagination, arguing that language reveals systematic processes at work (Evans and Green 2006). Cognitive linguists have argued that such processes are central to the way we think (e.g., Coulson 2000; Evans 2004, 2009b; Fauconnier 1997; Fauconnier and Turner 2002; Lakoff and Johnson 1999; Turner 1996).

One way in which cognitive linguists have approached the role of imagination in human thought has been by positing relatively stable knowledge structures which are held to inhere in long-term memory. These knowledge structures are termed *conceptual metaphors* (Lakoff and Johnson 1980, 1999) and are claimed to have psychological reality.[1] In addition, conceptual metaphors are held to be manipulated by a dynamic meaning construction process: *conceptual blending* (Coulson 2000; Fauconnier and Turner 1998; 2002; 2008; Grady 2005). The way in which these structures and processes have been studied has predominantly been to examine systematicities in figurative language, particularly within the framework of Conceptual Metaphor Theory (Lakoff and Johnson 1980, 1999). George Lakoff and Mark Johnson, the proponents of the study of conceptual metaphor, argue that figurative language is a consequence of the existence of a universal set of pre-linguistic *primary metaphors* (Lakoff and Johnson 1999; see also Grady 1997), and a language-specific set of conceptual metaphors, both of which map structure from more concrete domains of conceptual structure, referred to as *source domains*, onto less easily apprehended aspects of conceptual structure, referred to as *target domains*. Together these knowledge structures are held to give rise both to the productive use of figurative language, as well as to more creative aspects, such as poetic metaphor (see Lakoff and Turner 1989). More recently, it has been argued that conceptual metaphors have a neural instantiation (see discussion in Feldman 2006; Gallese and Lakoff 2005; Lakoff 2008; Lakoff and Johnson 1999).

While the success of both Conceptual Metaphor Theory and Conceptual Blending Theory provides the backdrop for the discussion in this paper, the

1. For discussion of the psychological reality of conceptual metaphors see, for example, Boroditsky (2000); Casasanto (2010); Casasanto and Boroditsky (2008); Evans (To appear); Gentner *et al*. (2002); Núñez *et al*. (2006); and Gibbs (1994).

analyses presented here are orthogonal to these approaches. Moreover, in certain respects, the present approach seeks to nuance the approaches (and theoretical constructs) developed by these theories (as discussed in detail later in the paper). In particular, Conceptual Metaphor Theory is not primarily (if at all) a theory *about* metaphor understanding in language. Rather, Conceptual Metaphor Theory has traditionally been concerned with the nature and the level of the various cognitive representations that serve to structure target domains in terms of sources domains. That is, Conceptual Metaphor Theory is a theory concerned with *backstage cognition*—the role of the non-linguistic conceptual processes that facilitate meaning construction behind the scenes—so to speak.[2] Analogously, Conceptual Blending Theory (Coulson 2000; Fauconnier and Turner 2002, 2008) is concerned with the conceptual processes involved in meaning construction, viewing language as impoverished prompts for semantic compositionality. For Fauconnier and Turner, what is really interesting about figurative language phenomena are the conceptual (rather than linguistic) processes that lie hidden from view, behind the scenes, so to speak.

In addition to the backstage cognition perspective, (cognitive) linguists require, I suggest, a theoretical account that models how language deploys and interfaces with the non-linguistic knowledge structures—the conceptual metaphors—and the conceptual mechanisms of meaning construction—the process of conceptual integration or 'blending'—during the process of figurative language understanding. That is, we require a theory that addresses *frontstage cognition*—an account that is concerned with the role of linguistic prompts and linguistic processes of semantic composition in figurative language understanding. Moreover, such an account must remain consonant with what is known about the structures and processes involved in figurative thought, in the light of the research programmes of Lakoff and Johnson, and Fauconnier and Turner, as well as others. That is, such an account of figurative language understanding must be psychologically plausible. I discuss this, below, in terms of findings concerning processing issues in figurative language comprehension.

In this paper I argue for a new (or at least a newly nuanced) perspective on the nature of semantic compositionality in figurative language. I do so by applying the *Theory of Lexical Concepts and Cognitive Models* (LCCM Theory for short) in order to provide the theoretical context for the account of figurative language understanding that I develop. The specific mechanisms I propose here are an attempt to model the interaction between linguistic knowledge and conceptual knowledge during the process of figurative language

2. It was Fauconnier who coined the term 'backstage cognition'—see Fauconnier (1994, 1997). For detailed discussion of the distinction between *frontstage cognition* and backstage cognition see Evans (2009b).

understanding. Another way of thinking about the proposals elaborated on below is that the present paper represents an attempt to provide the first detailed account of the processes involved in (linguistically-mediated) *composition*—in Fauconnier and Turner's 2002 terms—during conceptual blending. Thus, while LCCM Theory (Evans 2006, 2009b) models lexical representation, it is also concerned with the way in which lexical concepts interface with non-linguistic knowledge. As such, it addresses the thorny issue of semantic compositionality. In general terms, the LCCM worldview holds that meaning arises through *integration*. Hence, it meshes with, and as I argue later, is continuous with, the conceptual blending research programme.

My purpose here is not to elaborate the LCCM perspective in detail (see Evans 2009b for a book length treatment). In this paper, I apply LCCM Theory to figurative language understanding. Once I have introduced the key mechanisms provided by LCCM Theory in contributing to figurative language understanding I return to the issue of how the LCCM perspective interfaces with conceptual metaphors. I also consider how LCCM Theory fleshes out one aspect of the semantic integration perspective advanced by Conceptual Blending Theory: the role of linguistic knowledge in semantic (and conceptual) composition. I also consider the way in which LCCM Theory contrasts with Cognitive Grammar (Langacker 1987, 1991, 2008).

As the viewpoint I take in this paper is a frontstage cognition perspective—being concerned with semantic compositionality from the viewpoint of (figurative) language—rather than a backstage cognition perspective—the non-linguistic knowledge structures implicated (conceptual metaphors)—I am primarily concerned with (figurative) language. My objects of study are termed *linguistic metaphors*, and *linguistic metonymies*, to contrast them with non-linguistic knowledge structures, such as conceptual metaphors.[3] A linguistic metaphor, as I use the term, relates to an utterance-specific metaphoric conception. That is, it is a metaphor that resides in (and emerges from) a situated (and hence contextualised) instance of language use. Linguistic metaphors may draw upon non-linguistic knowledge (including conceptual metaphors). As I shall argue in section 6, below, linguistic metaphors draw on other sorts of knowledge too.

3. This distinction is in fact well established in the literature. For instance, scholars in the psycholinguistic tradition (e.g., Gentner 2001; Gentner and Bowdle 2008; Glucksberg 2001, 2008) are primarily concerned with 'linguistic' metaphors although they are concerned with the comprehension (and hence conceptual) strategies involved in the understanding of linguistic metaphors. In contrast, Lakoff and Johnson (1980, 1999) are concerned with conceptual metaphors, a level of metaphoric representation that does not rely on language. The terms 'linguistic metaphor' and 'mental metaphor' have been used in the literature previously by Daniel Casasanto (2010), to distinguish between the divergences that abound in mental representation and language use, in the realm of figurativity.

The paper is structured as follows. In the next section I introduce the figurative language phenomena that I will be presenting an account of. In section 3, I provide an overview of the theoretical perspective which provides the basis for the analysis: LCCM Theory. In section 4, I present an analysis of the distinction between literal and figurative forms in language understanding from the frontstage cognition perspective of LCCM Theory. Section 5 addresses the distinction between linguistic metaphor and linguistic metonymy from the perspective of LCCM Theory. In section 6, I examine the way in which LCCM Theory complements other approaches in cognitive linguistics, before providing a brief conclusion in section 7.

2. Phenomena to be accounted for

In the present paper I am concerned with providing a theoretical account of two related issues. Firstly, I address the factors that give rise to figurative language, and pinpoint differences in terms of the linguistic mechanisms involved in figurative versus literal language understanding. To do so, I examine recent research on the processing of figurative and literal language from the perspective of psycho- and neurolinguistics. Findings here suggest that, in processing terms at least, the traditional view (e.g., Grice 1975; Searle 1979) of a neat distinction between literal and figurative language is untenable. I argue that the difference between figurative and literal language is a consequence of three distinct factors modelled by LCCM Theory, which account for the various findings to emerge on differences (and similarities) between the way in which literal and figurative language are processed by the mind/brain.

Secondly, I am concerned with accounting for the distinction between two of the best studied types of figurative phenomena in cognitive linguistics, metaphor and metonymy. My focus is less on the distinction between metaphor and metonymy as conceptual phenomena (a backstage cognition perspective), but rather, with the way in which one might account for such figurative phenomena in terms of a theoretical account of language understanding (frontstage cognition). Hence, I am concerned with developing a theoretical account of how language users marshal linguistic and non-linguistic structures and mechanisms in the course of interpreting specific figurative utterances.

In the remainder of this section I elaborate on the nature of literal versus figurative language, and metaphor versus metonymy, the sets of phenomena for which I develop an account.

2.1. *Literal versus figurative language*

The standard pragmatic view holds that there is a neat distinction between literal and figurative language (Grice 1975; Searle 1979). For instance, a

putatively figurative expression such as: *My boss is a pussycat*, would first involve processing and then rejecting a literal interpretation (sentence meaning). A second stage would then be required, where communicative principles are deployed in order to interpret the speaker's intention (speaker meaning), giving rise to a figurative meaning. Such a view makes the following assumptions:

i) Literal language is processed more quickly than figurative language.
ii) Literal language is processed automatically while figurative language is not. If a literal conception is available no further processing is required.

We now know that the standard pragmatic view, and the assumptions it makes are, in fact, false. For instance, research on reading times associated with expressions that can be interpreted both idiomatically as well as literally e.g., *kick the bucket*, *spill the beans* has shown that the idiomatic meanings associated with expressions of this kind are understood more quickly than their literal meanings (Gibbs 1980, 1994; Gibbs *et al*., 1989; Giora *et al*., 2007). Moreover, other comprehension time tasks have shown that well-established metaphors are understood more rapidly than literal paraphrases (see Giora 2008 for a review). Moreover, even novel metaphors can be comprehended as rapidly as comparable literal expressions as long as the novel metaphors are contextually appropriate (Blasko and Connine 1993; see Glucksberg 2008 for discussion).

Other comprehension time tasks have found that just as figurative language can be processed as quickly as literal language, it is also processed automatically, contra the assumption made by the standard pragmatic view. One line of evidence for believing that literal language is processed automatically "without conscious control by the listener" (Miller and Johnson-Laird 1976: 166) is due to the well-known Stroop Effect (Stroop 1935). In this classic experiment subjects are asked to identify the colour of coloured cards. When the cards also feature a printed colour word (e.g., 'red'), if the word fails to correspond to the colour on the card, the word interferes with the processing of the correct colour response, as measured by reaction time. That is, even though the task doesn't ask subjects to do anything with the printed words, they are automatically processed.

In order to test whether figurative language is also processed automatically, Goldvarg and Glucksberg (1998) presented subjects with noun-noun compounds. While some could only be paraphrased literally, others could be paraphrased either literally or metaphorically. Such examples included *shark lawyer*, which can be interpreted literally: e.g., 'a lawyer who acts for an environmental group', or metaphorically: e.g., 'a lawyer who is predatory and aggressive'. If literal meanings, but not metaphorical meanings, are processed automatically, then the literal meaning should be the preferred interpretation. However, when subjects were asked to explain the meaning of such com-

pounds, 75% of the paraphrases produced were found to be metaphorical, even when a literal paraphrase existed. Goldvarg and Glucksberg argue that this finding demonstrates that metaphoric interpretations do indeed arise automatically.

In addition, findings from neurolinguistic research also support the view that metaphoric understanding begins as early in processing as literal understanding. One technique which has been employed to investigate differences between literal and figurative language processing is the measurement of event-related potentials (ERPs). An ERP is small voltage fluctuation in brain activity that can be measured in a non-invasive way, by having subjects wear a cap fitted with electrodes that measure voltages as they are exposed to linguistic stimuli. A particularly important ERP element is the so-called N400, which peaks approximately 400ms after exposure to a stimulus. ERPs are measured on a graph where relative amplitude of a given ERP element corresponds to relative electrical activity. The N400 is associated with integration of words or expressions with preceding words. In general terms, the N400 is greater when semantic integration is more difficult, which is interpreted as being an indication of greater processing cost. For instance, in sentences such as those in (1) one would expect the amplitude of the N400 to increase from (1a) to (1d):

(1) a. The gazelles ran for cover when chased by lions
    b. The gazelles ran for cover when chased by rabbits
    c. The gazelles ran for cover when chased by bicycles
    d. The gazelles ran away when chased by jam tarts

The standard pragmatic model, recall, claims that literal language is processed first. When a literal meaning is found to be incongruous, a figurative interpretation commences. In neurolinguistic terms, this model predicts an initial effect of literal incongruity, which should result in an increased N400, followed by a later ERP effect when metaphoric interpretation is activated. Pynte, Besson, Robichon and Poli (1996) tested this prediction by exposing subjects to literal and metaphoric sentences of the sort given in (2):

(2) a. Those animals are lions [literal stimulus]
    b. Those fighters are lions [metaphoric stimulus]

They found that both types of stimuli elicited an N400, with the metaphoric stimulus being slightly larger. However, they didn't find a subsequent reliable ERP effect. This suggests that while metaphoric integration may involve a different type of processing, the time course is similar to literal sentences, contrary to the prediction made by the standard pragmatic model.

In the same study, metaphorically true sentences such as those in (3a) evoked a smaller N400 than literal (but false) sentences such as (3b):

(3) a. The divorce is a nightmare
b. The divorce is a table

This provides evidence that metaphoric interpretation occurs at least as early as literal processing and can, in fact, be easier to process.

Other studies suggest that different types of literal and metaphoric interpretations involve different levels of complexity, in terms of processing. For instance, Coulson and Van Petten (2002) found that while the N400 of literal and metaphoric sentences was qualitatively the same, the amplitude increased as a function of metaphoricity. To illustrate, consider the following sentences:

(4) a. He knows whiskey is a strong intoxicant
b. He has used cough syrup as an intoxicant
c. He knows that power is an intoxicant

The first sentence provides a literal reading: whiskey is a strong intoxicant. The second sentence involves understanding cough syrup, which is not normally considered to have an intoxicating effect, as having the properties associated with intoxicants. Hence, the processing of this sentence involves integrating classes of entities that are not normally associated. Finally, the sentence in (4c) is metaphoric in nature, involving an abstract entity, power, which is being ascribed the properties of an intoxicant. Coulson and Van Pettern found that the N400 increased from (a–c), which they interpreted as being a consequence of increased complexity of semantic integration.

The findings briefly discussed above argue against a straightforward distinction, in processing terms, between the literal and the figurative. Coulson (2008) argues that processing costs are a consequence of the relative *complexity* of the mappings involved in integrating semantic elements. This means that while metaphoric language is often associated with a larger N400 this is not inevitably the case. We saw above, for instance, that metaphorically true assertions are processed more quickly than literally false assertions. Complexity, then, presumably involves not just integration of content from different regions of conceptual space (e.g., from different inputs of an integration network, as in Blending Theory), but successfully integrating semantic content which is in certain respects incongruent. An important consequence of the claim that relative complexity determines processing cost is that there are degrees of complexity, as is evident in the work of Coulson and Van Petten (2002).

In her work, Giora (e.g., 2003, 2008) also argues against assuming a straightforward literal/figurative distinction. She proposes, instead, a *salient*/*non-salient* distinction. Giora suggests that it is relative salience, rather than whether an expression is literal or figurative, which determines whether a particular meaning is processed more quickly. Empirical support for this perspective comes from the finding, discussed above, that idiomatic meanings are processed more quickly than their literal paraphrase. Moreover, novel metaphors

e.g., *Her mind is an active volcano*, take longer to process than more familiar metaphors, e.g., *Children are precious gems*, (Pexman *et al*., 2000), also in keeping with her salient/non-salient distinction.

Despite the foregoing, the fact that a straightforward literal/figurative distinction is not evident in terms of language processing, does not rule out the possibility that the distinction holds at the level of knowledge representation. Indeed, I argue below that there is a distinction in terms of the types of knowledge to which words provide access. This corresponds to the literal/figurative distinction. One of the consequences of the perspective I present is that figurativity is seen as a graded phenomenon, which is continuous in nature: interpretations exhibit degrees of figurativity.

Of course, one of the challenges for a theoretical account of figurative language understanding is to successfully deal with the range of empirical findings discussed above. I argue that figurative language understanding is influenced by three factors: *levels of knowledge representation*, relative *salience*, and relative *complexity*. I propose that it is the interaction of these three factors that accounts for the processing findings described above.

2.2. *Metaphor versus metonymy*

I now turn to the second issue I discuss in this paper. A large body of research in the cognitive science literature has assumed that figurative language is a "single monolithic category" (Coulson 2008: 191; see Gagnon *et al*., 2003; Oliveri *et al*., 2004 for critical reviews). While there are reasons for believing that the distinction between different sorts of tropes (e.g., metaphor vs. metonymy) is slippery (see Barnden 2010), there are nevertheless sound reasons for thinking that the terms *metaphor* and *metonymy* relate to prototypes belonging to distinct (albeit overlapping) categories, exhibiting clear differences in terms of form, as well as communicative and discursive function (see, for instance, Gibbs 1994; Cameron 1999, Deignan 2005a, 2005b, Barcelona 2000, Radden and Kövecses 2007, Panther and Thornburg 2003, Steen 2007).

My second objective in this paper is to provide an account of the meaning construction processes responsible for the figurative language phenomena often described as constituting metaphor and metonymy. These are exemplified by expressions of the following kind:

Metaphor
(5) My boss is *a pussycat*

Metonymy
(6) The *ham sandwich* has wandering hands

In contemporary language science, metaphor is often understood as involving the interpretation (or conceptualisation) of one entity in terms of something

else, as in *my boss* in terms of a *pussycat*. Metonymy on the other hand is often taken to relate to a referent other than the one literally designated. For instance, in (6), *ham sandwich* refers to a customer in a restaurant who happened to order a ham sandwich.

Traditionally, linguistic metaphor has been thought of as relating to an implicit comparison.[4] Examples such as those in (5), which make use of the predicate nominative ('X is a Y') construction, are the kinds of examples that are usually employed to support this perspective—although it is important to observe that metaphoric language with this form, while salient, is but a relatively small subset of the range of metaphoric language commonly used (see Deignan 2005a).

Within cognitive linguistics, early research argued that in contrast to metaphor, metonymy is primarily referential in nature, highlighting a particular referent by virtue of activating a contextually salient entity closely associated with the referent in question, sometimes expressed in terms of conceptual contiguity (see Lakoff and Johnson 1980; Lakoff and Turner 1989). For instance, in (6) above, given a restaurant scenario, the food item ordered by a given customer (ham sandwich) is likely, among waiting staff, to be particularly salient, and thus an effective means of identifying a specific referent, in this instance, a particular customer. As this example demonstrates, linguistic metonymy can be referential in nature: it relates to the use of expressions to 'pinpoint' entities in order to talk about them. This shows that (prototypical) metonymy may function differently from metaphor. Hence, while we might informally gloss the function of metonymy as the relation in which 'Y stands for X', by the same token, metaphor is the relation 'X understood in terms of Y'.[5] In this paper, I demonstrate the similarities and differences, in language understanding, between metaphor and metonymy (as prototypes).

3. LCCM Theory: An Overview

The account of figurative language understanding presented in this paper draws upon the Theory of Lexical Concepts and Cognitive Models, or LCCM Theory

4. See Evans and Green (2006) for a review.
5. It is important to note that a range of important work has been carried out on the linguistic function and conceptual basis of metonymy. Some of this work has emphasised other functions performed by metonymy. See in particular the collection of papers in Barcelona (2000), and Panther and Thornburg (2003). For important research on the conceptual basis of metonymy see Kövecses and Radden (1998), Peirsman and Geeraerts (2006). See also Barnden (2010) for a recent review of differences between metaphor and metonymy and Gibbs (1994). Nevertheless, I will continue to emphasise what I consider to be the salient referential function of metonymy in the remainder of this paper.

for short (see Evans 2006, 2007, 2009a, 2009b, 2010). LCCM Theory constitutes a model of lexical representation and semantic composition in language understanding. It models the nature of the symbolic units in language—and in particular semantic structure—the nature of conceptual representations, and the compositional mechanisms that give rise to the interaction between the two sets of representations—the semantic and the conceptual—in service of linguistically-mediated meaning construction. LCCM Theory derives its name from two theoretical constructs which are central to the model developed: the *lexical concept* and *cognitive model*. In this section I present an overview of LCCM Theory.

3.1. *Semantic Representation in LCCM Theory*

The overarching assumption of the theory is that the linguistic system emerged, in evolutionary terms, much later than the earlier conceptual system. The utility of a linguistic system, on this account, is that it provides an executive control mechanism facilitating the deployment of conceptual representations in service of linguistically-mediated meaning construction. Hence, 'semantic' representations in the two systems are of a qualitatively distinct kind. I model *semantic structure*—the primary semantic substrate of the linguistic system—in terms of the theoretical construct of the lexical concept. A lexical concept is a component of linguistic knowledge—the semantic pole of a *symbolic unit* (in Langacker's e.g., 1987 terms)—which encodes a bundle of various types of highly schematic *linguistic content* (see Evans 2006, 2009a, 2009b). In particular, linguistic content includes information relating to the selectional tendencies associated with a given lexical concept—the range of collocational and collostructional behaviour of a given lexical concept (see Evans 2006, 2009b).

While lexical concepts encode highly schematic linguistic content, a subset—those associated with open-class forms—are connected, and hence facilitate access, to the conceptual system. Lexical concepts of this type are termed *open-class lexical concepts*.[6] Such lexical concepts are typically associated with multiple areas in the conceptual system, referred to as *association areas*. The range of association areas to which a given lexical concept facilitates access is termed an *access site*. LCCM Theory assumes that the access site for a given *open-class lexical concept* is unique. As lexical concepts facilitate access to a potentially large number of association areas in the conceptual system, any given open-class lexical concept, in principle, facilitates access to a large *semantic potential*. However, only a small subset of this semantic potential is

6. See Evans (2009b) for the rationale for this position.

typically activated in *interpretation* of a given utterance. I identify distinct lexical concepts by providing a gloss in square brackets that relates to salient aspects of a lexical concept's linguistic content, and its *conceptual content*: the conceptual representations that make up its semantic potential.

While the linguistic system evolved in order to harness the representational power of the conceptual system for purposes of communication, the human conceptual system, at least in outline, is not far removed from that of other primates (Barsalou 2005), and shows some similarities with that of other species (Hurford 2007). In contrast to the linguistic system, the conceptual system evolved primarily to facilitate functions such as perception, categorisation, inference, choice and action, rather than communication. In LCCM Theory, *conceptual structure*—the semantic representational substrate of the conceptual system—is modelled by the theoretical construct of the cognitive model. A cognitive model is a coherent body of multimodal knowledge grounded in the brain's modal systems, and derives from the full range of experience types processed by the brain including sensory-motor experience, proprioception and subjective experience including affect.

The conceptual content encoded as cognitive models can become reactivated during a process referred to a *simulation*. Simulation is a general purpose computation performed by the brain in order to implement the range of activities that subserve a fully functional conceptual system. Such activities include conceptualisation, inferencing, choice, categorisation and the formation of ad hoc categories.[7]

In line with recent evidence in the cognitive science literature, LCCM Theory assumes that language can facilitate access to conceptual representations in order to prompt for simulations (see Glenberg and Kaschak 2002; Kaschak and Glenberg 2000; Pulvermüller 2003; Vigliocco *et al*., 2009; and Zwaan 2004. For a review see Taylor and Zwaan 2009. For nuanced views on the role of simulations see Chatterjee 2010; Mandler 2010). As noted above, in LCCM Theory this is effected by a subset of lexical concepts—open-class lexical concepts—facilitating access to the conceptual system via a number of association areas. Each association area corresponds to a cognitive model, as captured in Figure 1. A summary of some of the key terms deployed in LCCM Theory is presented in Table 1.

I now briefly illustrate the distinction between the content encoded in the linguistic system by lexical concepts, and the content encoded in the concep-

7. For discussion and findings relating to the multimodal nature of conceptual representations and the role of simulation in drawing on such representations in facilitating conceptual function see, for instance, Barsalou (1999, 2008), Glenberg (1997), Gallese and Lakoff (2005), and references therein.

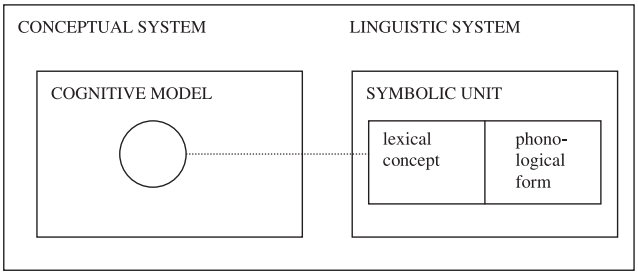

Figure 1. *An association between an open-class lexical concept and a cognitive model*

Table 1. *Key terms deployed in LCCM Theory*

Term	Description
Linguistic system	The collection of symbolic units comprising a language, and the various relationships holding between them
Symbolic unit	A conventional pairing of a phonological form and a semantic element
Lexical concept	The semantic element that is paired with a phonological form in a symbolic unit
Linguistic content	The type of content encoded by a lexical concept. This content is of a highly schematic type that can be directly encoded in language
Conceptual system	The body of non-linguistic knowledge captured from perceptual experience that is made of perceptual states. This knowledge derives from sensory-motor experience, proprioception and subjective experience
Cognitive model	The representational form that knowledge in the conceptual system takes, as modelled in LCCM Theory. Consists of multimodal information captured from brain states, which give rise to a potentially unlimited set of simulations
Conceptual content	The nature of the knowledge encoded by a cognitive model
Semantic structure	That part of semantic representation encoded by the linguistic system. Semantic structure is modelled, in LCCM Theory, by lexical concepts
Conceptual structure	That part of the semantic representation encoded by the conceptual system. Conceptual structure is modelled, in LCCM Theory, by cognitive models

tual system by cognitive models. To do so, consider the use of the lexical item *red* in the following examples, adapted from Zwaan (2004):

(7) a. The teacher scrawled in red ink all over the assignment
b. The red squirrel is in danger of becoming extinct in the British isles

In the examples in (7), *red* designates two different sorts of sensory experience. That is, while the hue derived from the use of *red* in (7a) is quite a vivid red, the hue prompted for by (7b) is likely to be closer to a dun/browny colour.

Hence, what I refer to as the semantic potential of *red* is not 'there' in the word itself. Whatever *red* designates, we are not dealing with purely linguistic knowledge. Rather, the word *red* provides access to (in this case), perceptual information and knowledge, which can be simulated, which is say, reactivated. Put another way, the hue derived is not a function of linguistic knowledge, but relates to what I am referring to as conceptual content. This is not to say that *red* does not provide linguistic knowledge. The form *red* has an associated lexical concept that I gloss as [RED]. This encodes schematic linguistic content, designating that an entity is being referred to, that the entity being referred to is a relation of some kind, and that the relation is specifically an attribute of a thing. In short, while linguistic content includes highly schematic semantic knowledge, conceptual concept concerns richly detailed knowledge grounded in the information captured from multimodal brain states.

3.2. *The Cognitive Model Profile*

An important construct in LCCM Theory, and one that is essential to providing an account of figurative language understanding, as we shall see below, is that of the *cognitive model profile*. As an open-class lexical concept facilitates access to numerous association areas within the conceptual system, it facilitates access to numerous cognitive models. Moreover, the cognitive models to which a lexical concept facilitates access are themselves connected to other cognitive models. The range of cognitive models to which a given lexical concept facilitates direct access, and the range of additional cognitive models to which it therefore facilitates indirect access is termed its *cognitive model profile*. To illustrate, consider the cognitive model profile for the lexical concept which I gloss as [FRANCE] associated with the form *France*. A partial cognitive model profile for [FRANCE] is represented in Figure 2.

Figure 2 represents an attempt to capture the sort of knowledge that language users must have access to when speaking and thinking about France. As illustrated by Figure 2, the lexical concept [FRANCE] provides access to a potentially large number of cognitive models. As each cognitive model consists of a complex and structured body of knowledge which provides access to other sorts of knowledge, LCCM Theory distinguishes between cognitive models which are directly accessed via the lexical concept—*primary cognitive models*—and those cognitive models which form sub-structures of those which are directly accessed—*secondary cognitive models*. These secondary cognitive models are indirectly accessed via the lexical concept.

The lexical concept [FRANCE] affords access to a number of primary cognitive models, which make up the *primary cognitive model profile* for [FRANCE]. These are hypothesised to include: GEOGRAPHICAL LANDMASS, NATION STATE and HOLIDAY DESTINATION. Each of these cognitive models provides access to

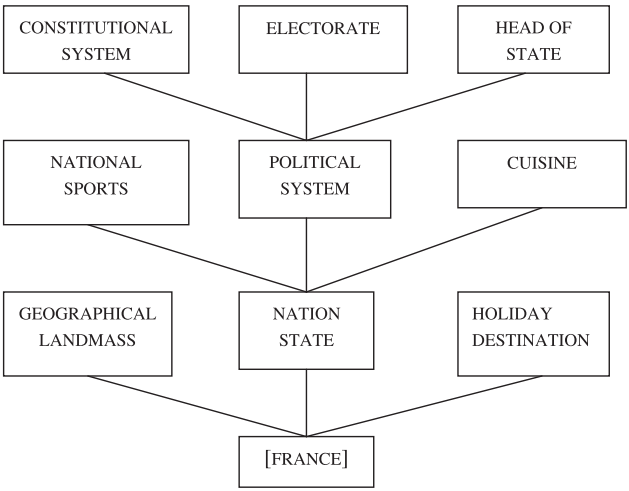

Figure 2. *Partial cognitive model profile for [FRANCE]*

further cognitive models. In Figure 2 a flavour of this is given by virtue of the various secondary cognitive models which are accessed via the NATION STATE cognitive model: the *secondary cognitive model profile*. These include NATIONAL SPORTS, POLITICAL SYSTEM and CUISINE. For instance, we may know that in France, the French engage in national sports of particular types, for instance, football, rugby, athletics, and so on, rather than others: the French don't typically engage in American football, ice hockey, cricket, and so on. We may also know that as a sporting nation they take part in international sports competitions of various kinds, including the FIFA football world cup, the Six Nations rugby competition, the rugby world cup, the Olympics, and so on. That is, we may have access to a large body of knowledge concerning the sorts of sports French people engage in. We may also have some knowledge of the funding structures and social and economic conditions and constraints that apply to these sports in France, France's international standing with respect to these particular sports, and further knowledge about the sports themselves including the rules that govern their practice, and so on. This knowledge is derived from a large number of sources including direct experience and through cultural transmission (including language).

With respect to the secondary cognitive model of POLITICAL SYSTEM, Figure 2 illustrates a sample of further secondary cognitive models which are accessed via this cognitive model. In other words, each secondary cognitive model has further (secondary) cognitive models to which it provides access. For instance, (FRENCH) ELECTORATE is a cognitive model accessed via the

cognitive model (FRENCH) POLITICAL SYSTEM. In turn the cognitive model (FRENCH) POLITICAL SYSTEM is accessed via the cognitive model NATION STATE. Accordingly, NATION STATE is a primary cognitive model while ELECTORATE and POLITICAL SYSTEM are secondary cognitive models.

3.3. *Semantic Composition in LCCM Theory*

LCCM Theory is motivated, in large part, by the observation that word meanings vary across contexts of use in terms of the conceptualisation that they, in part, give rise to. To illustrate, consider the following examples which relate to the lexical form *France*:

(8) a. France is a country of outstanding natural beauty
b. France is one of the leading nations in the European Union
c. France beat New Zealand in the 2007 Rugby world cup
d. France voted against the EU constitution in the 2005 referendum

In the first example, *France* relates to a specific geographical landmass coincident with the borders of mainland France. In the second example, *France* relates to the political nation state, encompassing its political infrastructure, political and economic influence and its citizens, including those in French overseas territories. In the example in (8c) *France* relates to the team of 15 rugby players, drawn from the pool of rugby players of French citizenship, who represented the French nation in the 2007 rugby world cup. In the final example, *France* relates to the French electorate, and specifically that part of the electorate which voted against proceeding with ratification of a proposed EU constitution in a national referendum in 2005. These examples illustrate that a word form such as *France* appears to be protean in nature: its meaning is flexible, in part dependent upon the context of its use.

LCCM Theory accounts for variation in word meaning by proposing two compositional mechanisms which integrate information deriving from context with linguistic content and conceptual content. These mechanisms facilitate the integration of words and other grammatical constructions such that an utterance-level simulation is derived. This utterance-level simulation (informally, what we might think of as utterance meaning), is termed a *conception* in LCCM Theory.

The two compositional mechanisms are *lexical concept selection* and *fusion*. The first, lexical concept selection, serves to identify the most appropriate lexical concept associated with a given form, during the processing of an utterance. As the linguistic system consists of symbolic units—conventional pairings between phonological forms and lexical concepts—a form may potentially be associated with a large number of distinct lexical concepts. To illustrate, consider the lexical form *in*, which occurs in the following examples:

(9) a. The kitten is in the box
b. The flag is flapping in the wind
c. John is in love

In each of these examples, a distinct lexical concept is selected for. The lexical concepts for *in* selected are [ENCLOSURE] for (9a), [PREVAILING CONDITIONS] for (9b) and [PSYCHO-SOMATIC STATE] for (9c).[8]

Selection relies on a number of constraining factors to determine the appropriate lexical concept: the lexical concept which best fits the conception under construction.[9] Once a lexical concept has been selected, it must be integrated with other selected lexical concepts of the utterance, and, if it is an open-class lexical concept, interpreted in the light of conceptual structure to which it affords access, and the other open-class lexical concept(s) with which it has been integrated. That is, the selected lexical concept undergoes the second compositional process: namely fusion.

Fusion is the integrative process at the heart of semantic composition in LCCM Theory, and the second of the two constituent processes of meaning construction. It results in the construction of a conception. This is achieved by recourse to two sorts of knowledge: linguistic content and conceptual content. Fusion is itself made up of two constituent processes: *lexical concept integration* and *interpretation*. The first relates to the integration of linguistic content, in order to produce, informally, the 'scaffolding' for the *activation* of conceptual content. Both sorts of information, and both types of processes, are necessary for the construction of meaning, and thus the formation of a conception.

Lexical concept integration involves the integration of lexical concepts in order to produce a composite unit: a *lexical conceptual unit*. The output of this process is a *semantic value*, a situated semantic attribution associated with a lexical conceptual unit based on integration of linguistic content. Hence, the semantic contribution of the lexical conceptual unit is highly schematic in nature.

The lexical conceptual unit then undergoes interpretation. That is, open-class lexical concepts within the lexical conceptual unit *activate* part(s) of the conceptual content (the semantic potential) to which they facilitate access. That part of the semantic potential that becomes activated is constrained by the nature of the semantic value for the lexical conceptual unit of which the open-class lexical concept(s) are part, and which emerges from integration. That is, interpretation—the activation of conceptual content—is constrained by integration—the *unpacking* of linguistic content. A diagrammatic

8. For discussion of the LCCM approach to polysemy see Evans (2010).
9. For further discussion of this issue see Evans (2009b).

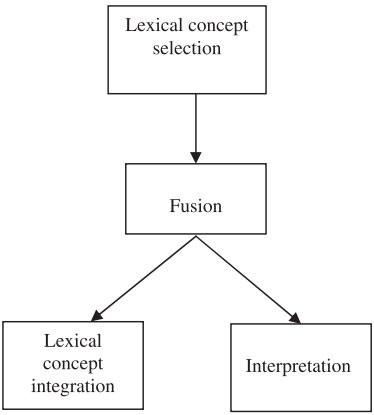

Figure 3. *Processes of semantic composition in LCCM Theory*

representation of the processes of semantic composition in LCCM Theory is provided in Figure 3.

As it is interpretation, the activation of conceptual content guided by unpacked linguistic content, that is the most relevant of the compositional mechanisms for the discussion of figurative language, I focus in the remainder of this section on a more detailed discussion of interpretation.

3.4. *Interpretation*

In a lexical conceptual unit it is only open-class lexical concepts that undergo interpretation. The outcome of interpretation results in the open-class lexical concepts achieving an *informational characterisation*, which is to say a semantic interpretation facilitated by simulation. This takes place by virtue of the relevant part of the semantic potential to which the lexical concepts facilitate access becoming activated.

In the canonical case, when there are two (or more) open-class lexical concepts in the same lexical conceptual unit, these lexical concepts undergo interpretation simultaneously. In such cases, interpretation of the lexical concepts is constrained by a process termed *matching*. The purpose of matching is to ensure that a coherent informational characterisation emerges: one in which coherent parts of the cognitive model profile to which the distinct lexical concepts facilitate access are activated. Hence, interpretation is a constrained process.

To provide an immediate illustration of how interpretation proceeds, consider the expressions in (10) and (11) in the light of the partial primary cognitive model profiles for [FRANCE] in Figure 4 (based on Figure 2), for [REGION] in Figure 5 and for [NATION] in Figure 6.

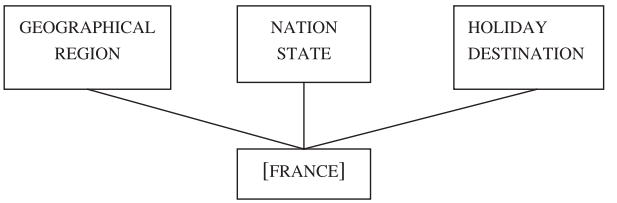

Figure 4. *Partial primary cognitive model profile for [FRANCE]*

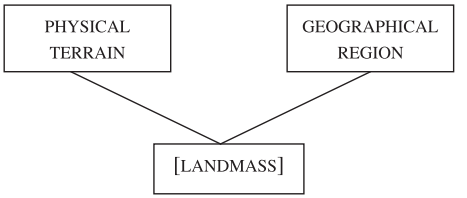

Figure 5. *Partial primary cognitive model profile for [LANDMASS]*

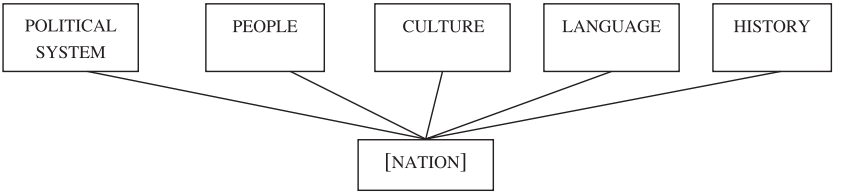

Figure 6. *Partial primary cognitive model profile for [NATION]*

(10) France, the landmass
(11) France, the nation

In each of these examples *France* receives a distinct informational characterisation. In (10) France relates to a geographical area, while in (11) it relates to a political entity. My purpose here is to illustrate how it is that each of these instances of *France* receives a distinct interpretation.

As we have seen earlier, the lexical concept [FRANCE] affords access to conceptual content relating, at the very least, to France as a geographical region, as a political entity—including knowledge relating to the French political system, the French people and their social customs practices, their history and language and, the national sports engaged in, and so forth—and to France as a holiday destination, with, perhaps, knowledge relating to the sorts of holiday activities it is possible (or typical) to engage in, in France, such as skiing (in the Alps), seaside holidays (on the Mediterranean coast), and so on.

The lexical concept [LANDMASS]—see Figure 5—facilitates access, at the very least, to primary cognitive models that relate to a physical terrain—a landmass can be hilly, mountainous, may consist of plains, woodland, and so on—or to a geographical area.

Figure 6 relates to a very partial primary cognitive model profile for [NATION]. This lexical concept, at the very least, facilitates access to cognitive models having to do with a political entity, a nation-state, and hence a particular political system, a people (with common customs, traditions, cuisine, and so on), and language (and/or languages), and a common (often complex) history. Interpretation works by virtue of the process of matching, which takes place between the cognitive model profiles accessed by the open-class lexical concepts which are subject to matching.

In terms of the examples in (10) and (11), the relevant lexical concepts are [FRANCE], [LANDMASS] and [NATION]. Interpretation involves establishing a *match* between one (or more) cognitive models in the cognitive model profiles associated with the relevant lexical concepts. This process serves to *activate* the matched cognitive models. For instance, in the example in (10), a match is established between the primary cognitive model profile associated with [LANDMASS], and one of the cognitive models to which [FRANCE] affords access. This of course is the cognitive model GEOGRAPHICAL REGION, accessed via the lexical concept [FRANCE], which becomes activated. In the second example, the match takes place between the primary cognitive model profile to which [NATION] affords access and the NATION STATE cognitive model to which [FRANCE] affords access. Hence, the reason for different readings of [FRANCE] in (10) and (11) is because the lexical concept in each utterance receives a distinct informational characterisation. In (10) interpretation results in an informational characterisation for [FRANCE] relating to France as geographical landmass. In (11) interpretation results in an informational characterisation of a political entity: France the nation-state.

The compositional mechanisms in LCCM Theory, including matching, are subject to constraints. These constraints are formalised by a number of principles that govern the operation of semantic composition.[10] The matching operation central to interpretation is constrained by the *Principle of Conceptual Coherence*. This can be stated as follows:

(12) Principle of Conceptual Coherence
Matching occurs between one or more cognitive models belonging to distinct cognitive model profiles, which share schematic coherence in terms of conceptual content.

10. See Evans (2009b) for detailed discussion.

This principle relies on a second principle, the Principle of Schematic Coherence:

(13) Principle of Schematic Coherence
The conceptual content associated with entities, participants and the relations holding between them must exhibit coherence in fusion operations.

What the two principles do, in (12) and (13), is to guarantee that matching takes place only when the cognitive models that undergo the matching process i) belong to different cognitive model profiles—and hence are accessed by different lexical concepts—and ii) exhibit coherence.

To illustrate consider the example in (14) which again employs the lexical concept [FRANCE]:

(14) France is beautiful.

The example in (14) provides what I will term a 'geographical region' conception. A common conception arising from (14), without a further specifying linguistic or extra-linguistic context, might relate to an understanding of France as a geographical region which is physically beautiful, for instance in terms of its landscape, and so forth. This takes place by virtue of the lexical concepts [FRANCE] and [BEAUTIFUL] undergoing matching, giving rise to an informational characterisation.

The Principles of Conceptual and Schematic Coherence in (12) and (13) determine how the matching process is constrained and hence how, in general terms, the cognitive models across cognitive model profiles to be matched are selected. To make this clear consider the partial cognitive model profile for the lexical concept [BEAUTIFUL], given in Figure 7. The lexical concept [BEAUTIFUL] facilitates access, at the very least, to cognitive models that have to do with multimodal knowledge relating to visual pleasure, non-visual pleasure (such as touch and sexual arousal, for instance), and aesthetic pleasure, relating, for instance, to our experience of pleasure arising from an appreciation of literature, music, language, and so on.

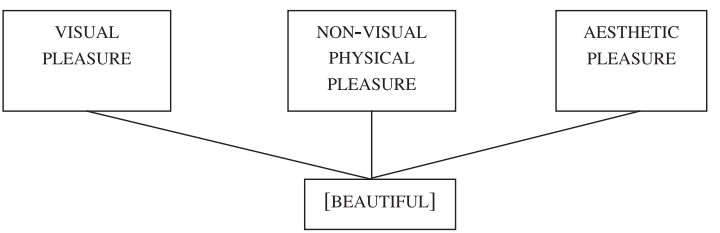

Figure 7. *Partial primary cognitive model profile for [BEAUTIFUL]*

Matching takes place by conducting what is referred to as a *search* in the primary cognitive model profiles of the two lexical concepts subject to matching, as guided by the principles in (12) and (13). That is, the primary cognitive models accessed by [FRANCE] (Figure 3) and [BEAUTIFUL] (Figure 7) are searched in order to identify a match at the level of schematic coherence across conceptual content. Put another way, the match relates not to details of similarity, but rather, how schematically coherent the conceptual content is. In terms of the three primary cognitive models given for [FRANCE] in Figure 4, only that of GEOGRAPHICAL REGION achieves a match in terms of schematic coherence with one (or more) of the primary cognitive models for [BEAUTIFUL]. After all, the HOLIDAY DESTINATION cognitive model has to do with the nature and types of holiday opportunities that exist in France, while the NATION STATE cognitive model concerns the nature of France as a political entity. In contrast, the GEOGRAPHICAL REGION cognitive model might include knowledge relating to the physical beauty, particularly the visual pleasure, that derives from aspects of France as a geographical region. Hence, a match takes place between at least one of the primary cognitive models accessed via [BEAUTIFUL] and the GEOGRAPHICAL region cognitive model accessed via the [FRANCE] lexical concept. For this reason, a match is established between the primary cognitive model profile of [BEAUTIFUL] and the GEOGRAPHICAL REGION cognitive model of [FRANCE]. This results in an informational characterisation 'geographical region' for [FRANCE].

4. Figurative Language in LCCM Theory

In this section I address figurative language from the perspective of LCCM Theory. I argue that distinct levels of knowledge representation—the distinction between primary versus secondary cognitive model profiles, as introduced above—gives rise to a distinction in literal versus figurative language. However, there are two further phenomena that are relevant for language understanding: salience and complexity. As we shall see, these three factors contribute to figurative language understanding, accounting for the psycholinguistic findings discussed earlier. Salience and complexity are also relevant for literal language understanding.

Salience, in present terms, relates to how well entrenched a given lexical concept is in semantic memory. Language understanding makes use of a complex repertoire of lexical concepts which are integrated—the process of lexical concept integration. As some lexical concepts are likely to be better entrenched than others, this provides one way in which the distinction between the literal versus figurative arises in terms of language processing, as I will discuss.

Complexity, in present terms, relates to the length of the *access route* through a cognitive model profile, as I shall discuss. In language understanding, greater

Table 2. *Theoretical constructs for modelling factors involved in figurative language understanding*

Phenomenon	How modelled in LCCM Theory?
Degree of literality/figurativity	Cognitive model profile structure (i.e., primary vs. secondary cognitive models)
Relative salience	Degree of entrenchment of lexical concept(s)
Relative complexity	Access route length (through the cognitive model profile)

processing effort, and hence greater complexity, is a consequence of the relative centrality of a conceptual unit of knowledge to a lexical concept's access site. The greater the *access route length*—which amounts to a greater number of cognitive models becoming activated in order to facilitate matching and hence interpretation—the more complex a given conception is. As with the notion of salience, complexity is a factor in language processing, which serves to blur the distinction between literal versus figurative language, as we shall see.

LCCM Theory takes the view that literal and figurative language are probably idealised end-points on continuum,[11] resulting from the intersection of these three distinct types of phenomena (summarised in Table 2). These three factors intersect during the process of language understanding to give rise to degrees of literality and figurativity. Moreover, the mechanisms provided by LCCM Theory elegantly model, I argue, findings from psycho- and neurolinguistics, as described by Coulson (2008), Glucksberg (2008) and Giora (2008), amongst others.

4.1. *Literal versus figurative language understanding*

In this section I present the way in which the distinction between literal versus figurative language is modelled by LCCM Theory. In later sections I consider the notions of salience and complexity.

The distinction between what I will refer to as a *literal conception*—the meaning associated with a literal utterance—on the one hand, and a *figurative conception*—the meaning associated with a figurative utterance—on the other, relates to that part of the semantic potential which is activated during the process of interpretation while constructing a conception. While a literal conception canonically results in an interpretation which activates a cognitive model, or cognitive models, within the primary, which is to say default, cognitive model profile, a figurative conception arises when a *clash* arises in the primary cognitive model profiles subject to matching. This is resolved by one of the

11. See also Sperber and Wilson (2008) who argue, albeit from a different perspective, that figurative language (e.g., metaphor) forms a continuum with other types of language use.

cognitive model profiles achieving a match in its secondary cognitive model profile. A figurative conception arises, therefore, when a match is achieved in the secondary cognitive model profile of one of the lexical concepts undergoing matching.

To illustrate, consider the following examples, again making use of the lexical concept [FRANCE], which relate to a literal versus a figurative conception respectively:

Literal conception
(15) France has a beautiful landscape

Figurative conception
(16) France rejected the EU constitution

A literal conception arises for the first example, in (15), by virtue of a match occurring between the informational characterisation of the lexical concepts associated with the expression *beautiful landscape*—the result of a prior match between [BEAUTIFUL] and [LANDSCAPE]—and the primary cognitive model profile to which [FRANCE] affords access, these being the only expressions in this utterance which are associated with conceptual content. This occurs as follows. The informational characterisation for [BEAUTIFUL] and [LANDSCAPE] undergoes matching with the cognitive model profile to which the lexical concept [FRANCE] facilitates access. Hence, a search takes place in the primary cognitive model profile associated with [FRANCE]. The Principles of Conceptual Coherence and Schematic Coherence ensure that a match is achieved in the primary cognitive model profile of [FRANCE].

In terms of activation of cognitive models for [FRANCE] in the example in (15), the Principle of Conceptual Coherence ensures that the GEOGRAPHICAL LANDMASS cognitive model for [FRANCE] is activated (recall the cognitive model profile for [FRANCE] presented in Figure 2). That is, it is this cognitive model which achieves a match with the informational characterisation associated with the lexical concepts associated with the expression *beautiful landscape*. Hence, the conception which arises for (15) is literal, as activation occurs solely in the primary cognitive model profile (of [FRANCE]).

In contrast to (15), the example in (16) is usually judged as being figurative in nature. While *France* in (15) refers to a specific geographical region—that identified by the term *France*—in the example in (16) *France* refers to the electorate majority who voted against implementing an EU constitution in a 2005 referendum.

This figurative conception arises due to a clash arising between the primary cognitive model profile of [FRANCE], as represented by Figure 4, and the informational characterisation associated with the expression *rejected the EU constitution*. That is, none of the primary cognitive models to which [FRANCE]

facilitates access can be matched with the informational characterisation associated with the expression *rejected the EU constitution* due to application of the Principles of Conceptual and Schematic Coherence given in (12) and (13).

The failure of matching in the primary cognitive model profile for [FRANCE] requires establishing a wider *search domain*, namely matching in the secondary cognitive model and hence cognitive models to which the lexical concept [FRANCE] provides only indirect access. This process of *clash resolution* is constrained by the Principle of Ordered Search which is given in (17):

(17) Principle of Ordered Search
If matching is unsuccessful in the default search domain, which is to say, a clash occurs, then a new search domain is established in the secondary cognitive model profile. The search proceeds in an ordered fashion, proceeding on the basis of secondary cognitive models that are conceptually more coherent with respect to the primary cognitive models (and hence modelled as being conceptually 'closer' in the cognitive model profile) prior to searching cognitive models that exhibit successively less conceptual coherence.

In essence, the Principle of Ordered Search ensures the following. When there is a clash in the primary cognitive model profiles of the lexical concepts or informational characterisation(s) in question, as in (16), a larger search region is established which includes cognitive models in relevant secondary cognitive model profile(s). This principle thus enables clash resolution by virtue of facilitating a search region beyond the default search region.

With respect to the example in (16), due to application of the Principle of Ordered Search, a secondary cognitive model is identified which achieves schematic coherence thereby avoiding a clash, and thus achieving a match. The cognitive model which achieves activation is the ELECTORATE cognitive model (see Figure 2). Hence, in (16), the process of interpretation results in an informational characterisation for [FRANCE] which is that of 'electoral majority'. As the ELECTORATE cognitive model is a secondary cognitive model (recall the discussion relating to Figure 2 above), this means that the conception is figurative in nature.

In order to summarise the main distinction between the construction of literal versus figurative conceptions, based on the mechanisms proposed by LCCM Theory, consider Figure 8.

Figure 8 illustrates the following. At interpretation, the primary cognitive model profiles for lexical concepts which afford access to conceptual content undergo matching. The Principle of Conceptual Coherence requires that a clash in the cognitive model profiles of the two (or more) lexical concepts undergoing interpretation is avoided. The Principle of Ordered Search ensures that if there is no match in the primary cognitive models of the lexical concepts subject to matching then clash resolution is required. In order to achieve this, a

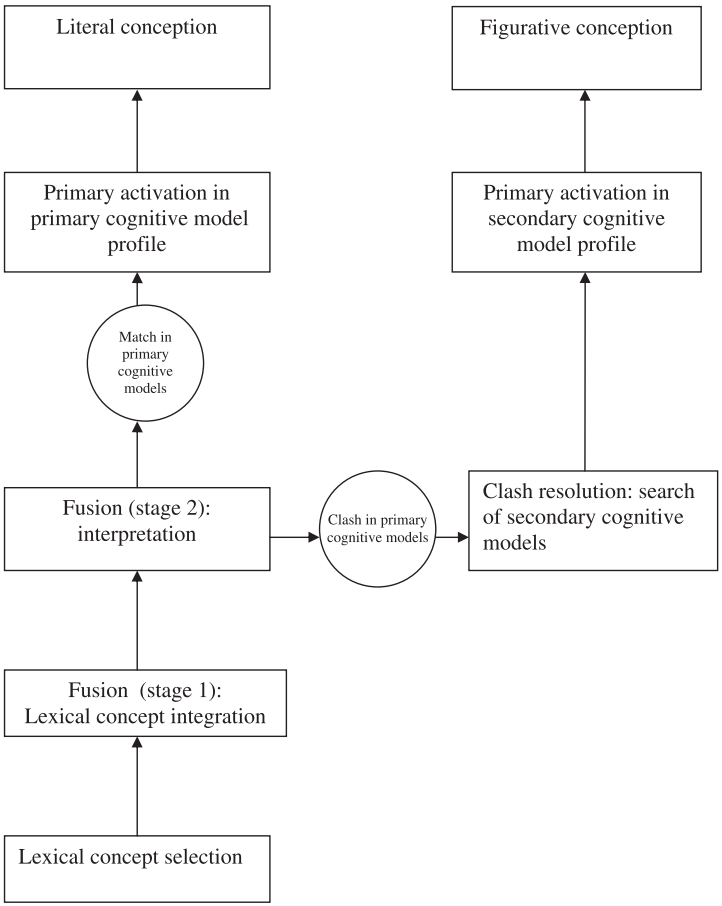

Figure 8. *Meaning construction processes in LCCM Theory leading to literal versus figurative conceptions*

search is initiated in the secondary cognitive model profile. The secondary cognitive model profile of a lexical concept relates to knowledge that is not directly associated with a given lexical concept, as it does not form part of a lexical concept's access site. As such, the secondary cognitive model profile constitutes a very large semantic potential available for search. The Principle of Ordered Search ensures that the search in the secondary cognitive model profile proceeds in a coherent way. That is, the secondary cognitive models are searched to facilitate a match based on their conceptual coherence with the primary cognitive models which form part of the lexical concept's access site. Hence, this principle ensures that secondary cognitive models are searched in

the order of their relative 'distance' from the point of lexical access. Secondary activation continues 'upwards' through the secondary cognitive model profile until a match is achieved, giving rise to activation of one or more secondary cognitive models. The consequence of this is that activation of a secondary cognitive model that is relatively further removed, in conceptual terms, from a secondary cognitive model that is relatively less removed from the default search region, is likely to be judged as being more figurative in nature.

In sum, the defining feature of a literal conception is that matching occurs in the primary cognitive model profiles of the relevant lexical concepts. The defining feature of a figurative conception is a clash in the primary cognitive model profiles of the relevant lexical concepts necessitating clash resolution, and hence activation of cognitive models in the secondary cognitive model profile of one (or more) of the relevant lexical concepts. Moreover, the further the conceptual distance required in the secondary cognitive model to achieve clash resolution by virtue of a successful match, the greater the access route length in the cognitive model profile, and hence the greater the figurativity of the expression (as discussed further below in terms of complexity).

4.2. *Salience*

While the situation described in section 4.1. relates to an idealised scenario, in practice language understanding is more complex than this. For one thing, semantic structure consists of a vast repertoire of lexical concepts—the semantic poles of linguistic forms, as described above. And moreover, lexical concepts exhibit degrees of complexity as they can be *internally open* or *internally closed*. For instance, the distransitive construction, as studied by Goldberg (e.g., 1995), and as exemplified in (18) involves a lexical concept that is internally open: the lexical concept in (18b) can be integrated with other lexical concepts as exemplified by the lexical concepts conventionally paired with the forms in (19):

(18) a. Form: 'Subj verb Obj1 Obj2'
b. Lexical concept: [ENTITY X CAUSES ENTITY Y TO RECEIVE ENTITY Z]

(19) *Sally, gave, John, a kiss*

In addition, forms can be conventionally paired with more than one internally open lexical concept. Consider the expression in (20):

(20) *I hit the roof*

This expression potentially instantiates two distinct lexical concepts, given in (21):

(21) a. [X EXERTS TRANSFER OF ENERGY WITH RESPECT TO Z]
b. [X BECOMES VERY ANGRY]

While the lexical concept in (21a) can be instantiated by a wide number of expressions, as in (22), which is a consequence of its form which is lexically underspecified, the lexical concept in (21b) has a smaller range of instantiations, as illustrated in (23):

(22) a. I/he/she/we/they hit the nail/wall/box/floor, etc.
b. I/he/she/we/they kicked the wall/box/floor/man, etc.
c. I/he/she/we/they punctured the balloon/tyre/bubble/inflatable ring, etc.
and so on

(23) a. I/he/she/we/they hit the roof
b. I/he/she/we/they will hit the roof
c. I/he/she/we/they are bound to hit the roof
and so on

The instantiation in (20) of (21a) is normally described as being literal, while the instantiation in (20) of (21b) is normally described as idiomatic (or figurative). But from the perspective of LCCM Theory, both lexical concepts are, in a fundamental sense, idiomatic. They relate to distinct lexical concepts: each provides a schematic meaning that can be instantiated by the expression in (20). The different interpretations associated with (20), the 'literal' ('I physically punched the roof') reading versus the idiomatic ('I flew into a rage') readings are a consequence of two distinct lexical concepts which encode a distinct semantic value: they are semantic units which are conventionally associated with a given form, and in this sense *are* idiomatic.

For the present discussion, what is important to bear in mind is that the lexical concept in (21b) is more saliently associated with the form in (20), than the lexical concept in (21a). This follows as the form with which the lexical concept in (21b) is conventionally paired is partially lexically specified, and includes the obligatory elements *hit the roof*, as exemplified in (24):

(24) a. Form: 'Subj *hit* + TNS *the roof*'

This being the case, LCCM Theory makes the claim that as the expression in (20) so closely instantiates the form in (24) which is conventionally paired with the lexical concept in (21b), the most salient reading of (20) will correspond more closely to the 'idiomatic' reading associated with the lexical concept in (21b) rather than (21a). In fact, LCCM Theory makes the further prediction that this reading should be processed more quickly than the 'literal' reading, which is exactly what psycholinguistic studies reported on above do indeed find.

In cases such as (20), where an idiomatic reading is derived, the process of clash resolution described in section 4.1. doesn't apply. This is because the process of interpretation follows, and is guided by, the process of lexical con-

cept integration. The lexical concept in (21b) provides a schematic semantic unit which guides the way in which the individual lexical concepts that are integrated with this internally open lexical concept are combined, and subsequently undergo interpretation. As there is a semantic unit that provides a holistic meaning, the entire expression functions as a single lexical concept for purposes of interpretation. That is, there is no matching to be done, and hence no clash to be resolved. And because there is no matching to be done, language understanding proceeds more quickly, in the case of the lexical concept in (21b) than the lexical concept in (21a).

I now turn to a slightly different manifestation of salience. In some accounts of figurative language phenomena, examples such as the italicised lexical items in each of the following are taken to be figurative (and specifically metaphoric) in nature:[12]

(25) a. That is a *loud* shirt
b. They have a *close* relationship
c. She is *in* love
d. That took a *long* time

In these examples, the use of *loud* refers to a brightly coloured shirt, *close* relates to emotional 'closeness', *in* relates to an emotional state while *long* relates to extended duration.

From the perspective of LCCM Theory, such usages relate to distinct lexical concepts, rather than interpretations arising due to clash resolution (as described in section 4.1.). For instance, LCCM Theory predicts that *long* has at least two conventionally established lexical concepts associated with it: [EXTENDED IN HORIZONTAL SPACE], and [EXTENDED DURATION]. During lexical concept selection the [EXTENDED DURATION] lexical concept is selected, as this is the most salient lexical concept associated with *long*, in view of the lexical concept that is paired with the form *time*.[13]

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12. For instance, some accounts of linguistic metaphor, such as the metaphor identification criteria as developed by the Pragglejaz Group (2007), would classify these examples as being instances of metaphor.

13. Note that, by claiming that conventional lexical concepts do not require clash-resolution, I am not excluding the possibility that examples such as (25) may give rise, at the conceptual level, to distinct conceptual metaphors, (e.g., DEVIANT COLOURS ARE DEVIANT SOUNDS for 'A *loud* shirt', or DEGREE OF AFFECTION IS SPATIAL CONNECTION for 'They have a *close* relationship', etc.), or that conceptual metaphors may have, in part, motivated the existence of the examples in the first place. I am simply making the point, from the perspective of a linguistically informed account of figurative language understanding, that there are likely to be highly conventional lexical concepts in addition to any putative conceptual metaphors (or metonymies). This is an issue I return to later in section 6 when I consider the status of conceptual metaphors within the LCCM account of figurative language understanding.

In processing terms, upon encountering the form *long*, both the [EXTENDED IN HORIZONTAL SPACE] AND [EXTENDED DURATION] lexical concepts will receive *background activation*. However, upon encountering the form *time*, the [EXTENDED DURATION] lexical concept is selected for. And crucially, the [EXTENDED DURATION] lexical concept conventionally associated with *long* provides a different access site to that of the [EXTENDED IN HORIZONTAL SPACE] lexical concept: both facilitate access to a different set of primary cognitive models. The [EXTENDED DURATION] lexical concept for *long*, and the [DURATION] lexical concept associated with *time* facilitate access to cognitive model profiles which can be matched in their primary cognitive model profiles. Hence, an example such as this does not lead to a clash in the primary cognitive model profiles undergoing matching.

In examples such as these, LCCM Theory is able to account for the finding that conventionalised 'metaphors' such as these examples are processed as quickly as putatively non-metaphorical examples. In fact, in the examples in (25), the linguistic context makes salient an entrenched lexical concept. From this perspective, (25d), for instance, is only judged as being metaphoric if the [EXTENDED DURATION] lexical concept for *long*, for instance, is judged by the analyst as, in some sense, less prototypical (or more abstract) than the [EXTENDED IN HORIZONTAL SPACE] lexical concept. In terms of the prediction made by LCCM Theory, in all other respects, these examples are no different, in processing terms, than those given in (26):

(26) a. That is a *green* shirt
b. They have a *loving* relationship
c. She *experiences* love
d. That took an *extended period* of time

The LCCM Theory account of expressions such as *long*, as in *long time*, is consonant with the approach developed in the *Career of Metaphor Hypothesis* (Bowdle and Gentner 2005). In the Career of Metaphor Hypothesis, highly conventionalised linguistic metaphors are treated as being polysemous sense-units which are conventionally associated with the 'base' term, here, *long*, and which are accessed via a 'lexical look-up' process, rather than by establishing structural alignments and inference projections (mappings) between a base and target.

From the LCCM perspective, the interesting question in such cases concerns not whether these cases are metaphoric or not—they do not involve clash resolution and hence are not figurative conceptions, from the LCCM perspective. Rather, the more interesting question concerns how an [EXTENDED DURATION] lexical concept became conventionally associated with the form *long* in the first place. Recent work on semantic change pioneered by Elizabeth Closs

Traugott (e.g., Traugott and Dasher 2004) has argued that situated implicatures (or invited inferences) can become 'detached' from their contexts of use and reanalysed as being distinct sense-units—lexical concepts in present terms—which are associated with a given form.

The [EXTENDED DURATION] lexical concept associated with *long* might be historically derived from contexts of communication in which reference to length can be understood as reference to duration without harming expression of the communicative intention, as in communication about 'long journeys'. Through repeated use of this form in such *bridging contexts* (Evans and Wilkins 2000), which is to say, with the inferred meaning, it is plausible that *long* developed an [EXTENDED DURATION] lexical concept by virtue of *decontextualisation* (Langacker 1987).

4.3. *Complexity*

The third factor that I consider in figurative language understanding is complexity. This relates to the length of the access route, in cases of clash resolution. Access route length gives rise to degree of figurativity. That is, figurative conceptions themselves exhibit degrees of figurativity and hence are graded. LCCM Theory claims that a longer access route corresponds to a more figurative conception. Moreover, it predicts that that there is a greater processing cost associated with conceptions involving a greater access route length, for instance in terms of the amplitude of the N400 (in ERP terms).

To illustrate, consider the following metaphoric conceptions:

(27) a. That soldier is a lion
b. That ballerina is a lion

LCCM Theory claims that figurative conceptions emerge for examples such as those in (27). Due to a failure to match in the primary cognitive model profiles to which [SOLDIER] and [LION], and [BALLERINA] and [LION] facilitate access, clash resolution is initiated. This involves, in both cases, establishing a search region in the secondary cognitive model profile for [LION].[14] Due to the Principle of Ordered Search, the search proceeds such that cognitive models that are conceptually closer to the access site are searched prior to those which are conceptually more distant. Due to the Principle of Conceptual Coherence, the search is only complete when a match is achieved between a cognitive

14. See discussion in section 5 for why it is that a search region is established in the cognitive model profile for [LION] rather than [SOLDIER] or [BALLERINA].

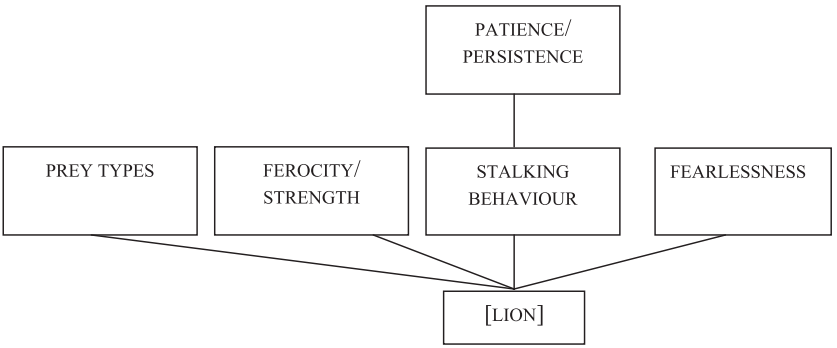

Figure 9. *Partial cognitive model profile for [LION]*

model in the respective primary cognitive model profiles of [SOLDIER] and [BALLERINA], on one hand, and the secondary cognitive model profile of [LION] on the other. To illustrate, consider a partial cognitive model profile for [LION] in Figure 9.

The lexical concept [LION] facilitates access to a number of primary cognitive models: its access site. These include, at the very least, bodies of knowledge relating to a lion's physical attributes, including its bodily form—its morphology, the fact that lions have a mane, lionesses don't, and so on—its social behaviour—including social groupings, mating behaviour, and so on—its habitat—including the geographical regions where lions are found—and its hunting behaviour. The cognitive model HUNTING BEHAVIOUR provides access to a range of secondary cognitive models including information about prey types (buffalo, wildebeest, gazelle, and so on), which can often be larger than the lion, the behaviour it exhibits in stalking and subsequently subduing prey including ferocity and strength, and the apparent fearlessness exhibited by lions in attacking prey often much larger than themselves. A further secondary model, which is presumably accessed from scenarios involving the stalking behaviour exhibited by lions, is that of the immense patience and PERSISTENCE exhibited. Like all cats, lions have great acceleration but little stamina, hence they must get very close to their intended prey if they are to have a reasonable chance of catching and subduing the herbivores they prey upon before their prey can escape. Lions (and particularly lionesses) exhibit extreme patience in stalking prey in order to gain an opportunity to strike.

Returning to the examples in (27), the kinds of scenarios in which soldiers may find themselves, in which they face a strong enemy, and must risk their lives, may require displays of STRENGTH/FEROCITY and/or FEARLESSNESS.

Hence, when describing a soldier as a lion, LCCM Theory would predict that, without a further narrowing context, either (or both) of these secondary cognitive models become activated in service of facilitating clash resolution.

The utterance involving a ballerina is slightly different: after all, a ballerina as part of her professional duties does not normally engage in situations which require displays of ferocity or fearlessness. However, ballet, by its very nature, requires a vast amount of practice. And, moreover, it can require undergoing a great deal of discomfort, as evidenced by the physical deformities that experienced ballerinas can suffer due to the physically demanding nature of some of the techniques practised on a daily basis. In this context, describing a ballerina as a lion might activate the PATIENCE/PERSISTENCE secondary cognitive model associated with [LION].

While fearlessness and ferocity are qualities that are perhaps, self-evidently associated with lions, patience/persistence is less obviously associated with lions. Nevertheless, my claim is that some language users, especially zoologists, and others who have detailed knowledge of lions, are likely to have knowledge relating to the displays of extreme patience exhibited by lions in stalking their prey. But the very fact that such a secondary cognitive model may require specialist knowledge of the hunting behaviour associated with lions demonstrates that the knowledge structure I gloss as PATIENCE/PERSISTENCE is conceptually less 'close' to the access site (the primary cognitive models) for [LION] than STRENGTH/FEROCITY or FEARLESSNESS. Put another way, to activate the PATIENCE/PERSISTENCE secondary cognitive model involves a longer access route than that required to activate either the STRENGTH/FEROCITY or FEARLESSNESS secondary cognitive models. Thus, the prediction made by LCCM Theory is that the example in (27b) would be judged as exhibiting greater figurativity than the example in (27a). And moreover, the further prediction would be that this is due to greater complexity involved in integrating the cognitive model profiles involved (that associated with [LION] with that accessed by [SOLDIER], and [LION] with [BALLERINA]). Hence, in processing terms, the prediction is that there is a greater cognitive cost involved in processing (27b) than (27a). The neurolinguistic findings discussed by Coulson (2008) seem to support such a prediction.

5. Metaphor and Metonymy

In the light of the discussion in section 4.1., in this section I consider the nature of two specific types of figurative conceptions: those associated with metaphor and metonymy in language understanding. This section illustrates that, using the meaning construction mechanisms of LCCM Theory, it is possible to distinguish (at least prototypical) instances of metaphoric and metonymic language.

5.1. *Metaphor*

In this section I focus on metaphoric conceptions employing the predicate nominative (i.e., 'X is a Y') construction.[15] This has traditionally been the kind of linguistic form *par excellence* that has been studied under the heading of metaphor, particularly by psycholinguists (e.g., Giora 2003, Glucksberg 2001 and Gentner *et al*., 2001), philosophers of language (Leezenberg 2001; Stern 2000) and scholars in the pragmatics tradition (e.g., Carston 2002; Sperber and Wilson 1995, 2008).[16] To illustrate, I will consider the metaphoric conception that emerges based on the example in (28)

(28) My boss is a pussycat

What is strikingly figurative about the example in (28) is that the entity designated by *my boss* is not normally taken as being a member of the class of pussycats. Nevertheless, the predicate nominative construction is normally taken as having a class-inclusion function associated with it:

(29) My boss is a beer drinker

This expression, exemplified by the utterance in (29), involves the copular or 'linking' verb *be* which combines with a nominal, e.g., 'a beer drinker'. The nominal functions as the essential part of the clausal predicate: 'is a beer drinker'. The function of the lexical concept conventionally paired with 'be' in this symbolic unit is to signal a stative relation (Langacker 1991): namely, 'my boss is a member of the class of beer drinkers', a situation which persists through time.

The same cannot hold for the example in (28) as, in the normal course of events, someone's boss cannot literally be a pussycat. That is, the entity designated by the expression *my boss* is not normally taken to be a member of the class of pussycats. The metaphoric conception which this utterance gives rise to is derived from a property which is usually associated with pussycats, namely that they are extremely docile and often affectionate, and thus not frightening or intimidating in any way. In this utterance, we are being asked to understand the boss, not in terms of being a pussycat, but in terms of exhibiting some of the properties and behaviours often associated with pussycats as manifested towards their human owners, such as being docile, extremely friendly and thus non-forbidding and perhaps easy to manipulate.

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15. I will consider other types of metaphoric language later when I discuss Conceptual Metaphor Theory.
16. It is important to note that this particular construction forms only a small subset of the way metaphor emerges in language use, cf. *Jane is a weasel* vs. *Jane weaselled out of that*. See Deignan (2005a) for a corpus-based analysis of the forms that metaphoric language takes.

The LCCM approach to figurative meaning construction allows us to see the similarities and differences between metaphor and the literal predicate nominative examples such as (29). An important point of similarity relates to the process of fusion crucial for meaning construction, involving interpretation in particular. As noted in section 4.1., figurative language, of which (prototypical) metaphor is a sub-type, diverges from literal language use in terms of activation in the secondary cognitive model profile of the lexical concept which is undergoing clash resolution.

In an utterance such as 'My boss is a beer drinker', the two relevant lexical concepts for interpretation are [BOSS] and [BEER DRINKER]. This follows as these are the only two lexical concepts in the utterance which have access sites and thus provide direct access to conceptual content. Interpretation proceeds by attempting to match cognitive models in the primary cognitive model profiles associated with each of these lexical concepts as guided by the Principle of Conceptual Coherence and application of the Principle of Ordered Search. A match is achieved in the primary cognitive model profiles of each lexical concept. That is, it is semantically acceptable to state that *My boss is a beer drinker* because the referent of *my boss* is a human and humans can (and do) drink beer.

Now let's consider how the metaphoric conception arises. In the example in (28), the process of interpretation leads to a clash in the primary cognitive model profiles of [BOSS] and [PUSSYCAT]. This is where metaphor differs from literal class-inclusion statements. A partial primary cognitive model profile for [BOSS] is provided in Figure 10.

The primary cognitive model profile for [BOSS] includes, at the very least, cognitive models relating to the fact that a boss is, typically, a human being, and the complex body of knowledge we each possess concerning what is

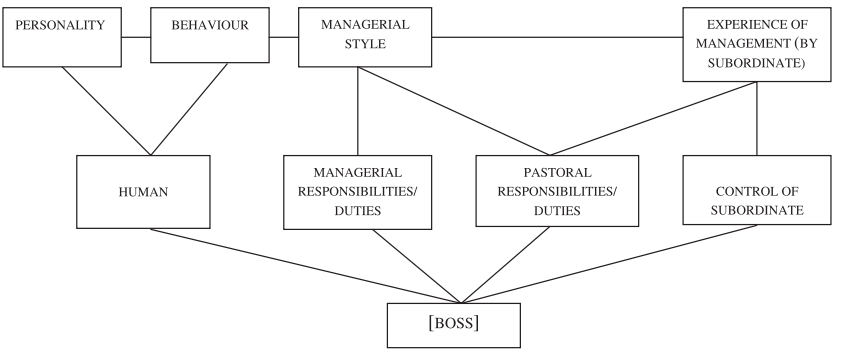

Figure 10. *Partial cognitive model profile for [BOSS]*

involved in being a human being, that a boss has particular pastoral responsibilities with respect to those for whom he or she is line-manager, as well as managerial responsibilities and duties, both with respect to those the boss manages, the subordinate(s), and the particular company or organisation for whom the 'boss' works. In addition, there are an extremely large number of secondary cognitive models associated with each of these, only a few of which are represented in Figure 10. In particular, by virtue of being a human being, a boss has a particular personality and exhibits behaviour of various sorts, in part a function of his/her personality, in various contexts and situations. In addition, each boss exhibits a particular managerial style, which includes interpersonal strategies and behaviours with respect to those the boss manages. The boss can, for instance, be aggressive or docile with respect to the subordinate. Moreover, there is a clichéd cultural model of a ferocious and aggressive boss who seeks to keep employees 'on their toes' by virtue of aggressive and bullying interpersonal behaviour. By contrast, a boss who is relatively placid and can thus be treated as a colleague rather than a superior may be somewhat salient with respect to the stereotype.[17]

Just as the lexical concept for [BOSS] has a sophisticated cognitive model profile to which the lexical concept potentially affords access, so too the [PUSSYCAT] lexical concept provides access to a wide range of knowledge structures. A very partial cognitive model profile is provided in Figure 11.

The lexical concept [PUSSYCAT] relates to cognitive models having to do with, at least, knowledge concerning physical attributes, including body shape and size, diet and eating habits, patterns of behaviour, and a pussycat's status in western culture as the household pet of choice for many people. In terms of secondary cognitive models, there are a number that relate to our knowledge associated with the sorts of behaviours pussycats exhibit. For instance, pussycats exhibit motor behaviour of certain kinds including the particular manner of motion pussycats engage in. Pussycats also exhibit animal behaviours of certain kinds including hunting, reproduction and so forth. Finally, pussycats also exhibit social behaviour, including behaviour towards other conspecifics, and behaviour towards humans. Hence, social behaviour is a cognitive model relating to at least two primary cognitive models: those of PATTERNS OF BEHAVIOUR and HOUSEHOLD PET.

In the example in (28), a figurative conception arises due to a failure to establish a match in the primary cognitive model profiles associated with [BOSS] and [PUSSYCAT], the two lexical concepts relevant for interpretation. Hence, a

17. See Lakoff's (1987) discussion of the way in which what he refers to as idealised cognitive models (ICMs), can metonymically give rise to prototype effects, by serving as 'cognitive reference points'.

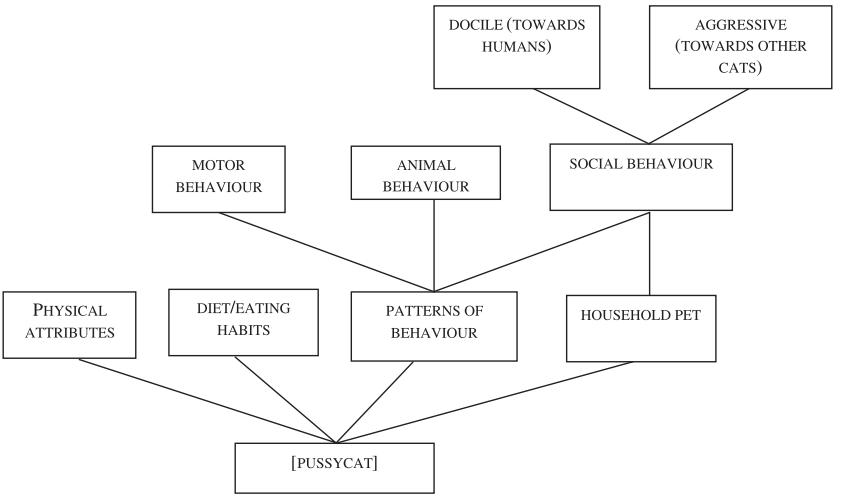

Figure 11. *Partial cognitive model profile for [PUSSYCAT]*

clash occurs leading to a search in a secondary cognitive model profile. In LCCM Theory, the particular lexical concept selected for clash resolution, and hence, for activation in the secondary cognitive model profile, is contextually determined. This is formalised as the *Principle of Context-induced Clash Resolution*. This can be stated as follows:

(30) Principle of Context-induced Clash Resolution
In cases where clash resolution is required, the lexical concept whose secondary cognitive model profile is searched to resolve the clash is determined by context. This is achieved by establishing a *figurative target* and a *figurative vehicle*, on the basis of context. The lexical concept that is established as the figurative vehicle is subject to clash resolution.

In the utterance in (28), I am assuming a discourse context in which the speaker has been discussing their boss. In such a context, the figurative target (or *target* for short) is the boss, as this is the topic or theme of the utterance. Informally, the point of the utterance is to say something 'about' the boss. From this it follows that the figurative vehicle (or *vehicle* for short), is the pussycat. Crucially, it is the secondary cognitive model profile of the vehicle, here [PUSSYCAT], rather than the target, which undergoes search in order to facilitate clash resolution. In other words, the principle in (30) serves to determine which of the lexical concepts' secondary cognitive model profiles is subject to search.

Before concluding the discussion of the example in (28), a caveat is in order. In my discussion thus far I have assumed that the literal class inclusion statement, as in (29) involves the same symbolic unit (and hence the same lexical concept) as the metaphoric version of the predicate nominative construction in (28). I have done so for purposes of explicating the nature of figurative language conceptions, in order to contrast them with metonymic conceptions, below. Yet, as should by now be clear, as LCCM Theory assumes a constructional perspective on grammatical organisation (e.g., Goldberg 2006; Langacker 2008), a difference in form and/or meaning is indicative of a different symbolic unit and hence lexical concept. Accordingly, it is likely that the lexical concepts associated with the expressions in (28) and (29) are not, in fact, motivated by a single predicate nominative symbolic unit. Rather, the fact that human agents can have attributes of animals ascribed to them highly productively, as evidenced by examples such as (31), suggests that English speakers have an entrenched symbolic unit of the type indicated in (32):

(31) Sam is a wolf/pig/lion/fox/mouse, etc.

(32) a. Form: 'SUBJECT BE+TNS *a* ANIMAL TERM'
b. Lexical concept [VOLITIONAL AGENT X HAS FUNCTIONAL ATTRIBUTE(S) OF ANIMAL Y]

From this perspective, the 'metaphoric' reading resulting from (28) is due to the lexical concept given in (32b), rather than being due to a 'class inclusion' lexical concept (cf. the example in (29)). LCCM Theory therefore predicts the following in terms of processing. The 'class inclusion' lexical concept is plausibly better entrenched (and hence more salient without a specific context) than the lexical concept in (32b). That being so, when a language user is exposed to an example such as (28) they begin by processing the class inclusion lexical concept. Upon encountering the animal term, *lexical concept selection revision* takes place, such that a new lexical concept is selected for: that provided in (32b). The prediction, therefore, is that there should be a slightly higher N400, in ERP terms, for examples such as (28) and (31) than those such as (29).

In view of this caveat, how then should we interpret the discussion of the figurative conception for (28) given above? I assume that the class inclusion lexical concept associated with the predicate nominative form existed in the language prior to the emergence of the lexical concept in (32b). In fact, it is plausible that the lexical concept in (32b) emerged historically from the 'literal' class inclusion lexical concept.[18] This process of semantic change plausi-

18. For detailed discussion of the way in which 'metaphoric' lexical concepts emerge from 'literal' lexical concepts see the discussion of the emergence of the 'state' lexical concepts from the spatial senses for *in, on* and *at* in Evans (2010).

bly involves usage-based bridging contexts, and pragmatic strengthening as alluded to above in the discussion of the examples in (25). Hence, the discussion of how the metaphoric conception for (28) arises, described above, is likely to relate to an earlier stage in the language, before the lexical concept in (32b) had become conventionally associated with the form in (32a), i.e., before it had unit-like status.

5.2. *Metonymy*

I now turn, briefly, to the LCCM account of *metonymic conceptions*. I do so in order to contrast this with the LCCM account of metaphoric conceptions. In this section I will consider the example in (33) in order to illustrate the way metonymic conceptions are derived.

(33) The ham sandwich asked for the bill

As we saw with the earlier analysis of the example in (16) and the analysis of metaphoric conceptions, one aspect of language understanding that is common to both metaphor and metonymy in the LCCM account is that language understanding involves activation of cognitive models in the secondary cognitive model profile of a particular lexical concept. Hence, clash resolution is required, which is the distinguishing feature of figurative as opposed to literal meaning construction (the other features, salience and complexity are also involved—although these phenomena are also involved in literal language processing).

In the utterance in (33) the lexical concept [HAM SANDWICH] undergoes interpretation in conjunction with the informational characterisation 'asked for the bill'. However, there is a clash between the informational characterisation, and the primary cognitive model profile of [HAM SANDWICH]. After all, a ham sandwich is not, normally, conceived of as an animate entity that can ask for the bill.

Due to the Principle of Context-induced Clash Resolution, the customer who ordered the ham sandwich is identified as the figurative target, and the ham sandwich is identified as the figurative vehicle. Accordingly, it is the cognitive model profile associated with the lexical concept [HAM SANDWICH] which becomes the site for clash resolution. Following the Principle of Ordered Search, the search region for clash resolution is expanded to take in secondary cognitive models associated with [HAM SANDWICH]. A partial cognitive model profile for [HAM SANDWICH] is provided in Figure 12.

In this example, clash resolution is achieved by virtue of a search occurring in the secondary cognitive model profile of [HAM SANDWICH]. The cognitive model which achieves activation is that of RESTAURANT CUSTOMER.

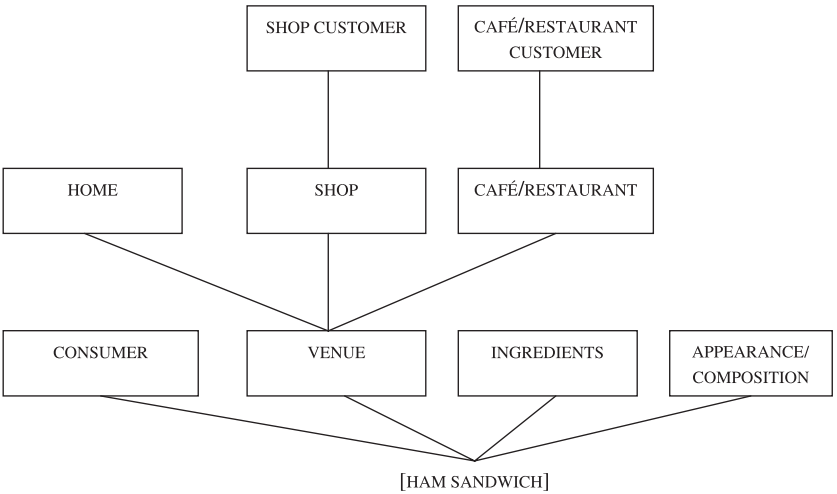

Figure 12. *Partial cognitive model profile for [HAM SANDWICH]*

5.3. *Metaphor versus metonymy*

As observed earlier, it has often been pointed out that metonymy, but not metaphor, has a referential function—one entity serves to stand for, or identify, another, as in a 'ham sandwich' serving to identify the particular customer who ordered the ham sandwich. In contrast, previous scholars have variously argued that metaphor serves to frame a particular target in terms of a novel categories, e.g., *My job is a jail* (e.g., Glucksberg 2001; Carston 2002), or analogy, e.g., *Juliet is the sun* (e.g., Gentner *et al*., 2001). That is, the prototypical linguistic metaphor has what we might *very* loosely refer to as a *predicative function*.

From the perspective of LCCM Theory, the distinction between the prototypical functions of metaphor and metonymy relates to whether the figurative target and figurative vehicle exhibit *alignment*, and hence whether the *clash resolution site* corresponds to the figurative target. To illustrate, let's reconsider the metaphoric conception of *My boss is a pussycat*. In this example, the figurative target is the lexical concept [BOSS] and the figurative vehicle is [PUSSYCAT]. Following the Principle of Context-induced Clash Resolution, the cognitive model profile for [PUSSYCAT], the figurative vehicle, is the clash resolution site: activation of a secondary cognitive model takes place here.

This situation differs with respect to metonymy. In the 'ham sandwich' example, the 'customer' corresponds to the figurative target, as determined by the Principle of Context-induced Clash Resolution, and the figurative vehicle corresponds to the 'ham sandwich'. However, both contextually salient elements

are accessed via the cognitive model profile associated with a single lexical concept: [HAM SANDWICH]. In other words, there is alignment, in a single cognitive model profile, of the figurative target and vehicle. Hence, the site of clash resolution corresponds to the access route for the figurative target: 'customer'.

In sum, LCCM Theory reveals a divergence in the prototypical properties of metaphor and metonymy, which emerges as an outcome of the application of regular meaning construction mechanisms. Figurative conceptions which are labelled as 'metonymic' arise due to the figurative vehicle facilitating direct access to the figurative target due to alignment of the figurative vehicle and target in the same lexical concept and cognitive model profile. In contrast, 'metaphoric' conceptions arise due to a divergence between figurative vehicles and targets across two distinct lexical concepts.

In the final analysis, metaphor and metonymy are terms that have been applied by different scholars to a range of overlapping and sometimes distinct figurative language phenomena. What emerges from the LCCM account is that the intuitions that lie behind the use of these terms to data of particular kinds is a function of small set of compositional mechanisms that are guided by various sorts of constraints (the principles identified in this paper). Although only a small set of data have been considered in this paper, I argue that the application of these mechanisms and principles gives rise to a range of figurative conceptions which, in terms of discourse functions, are continuous in nature. That is, from the perspective of language understanding, while there are, what might be thought of as, symptoms of metaphor and metonymy, there is not always a neat distinction that can be made that serves to identify where metaphor ends and metonymy begins.

6. LCCM Theory in comparison and contrast

In this section I consider how LCCM Theory interfaces with two theories of backstage cognition. I argue that it refines how the theoretical construct of the conceptual metaphor is viewed, treating it as but one type of knowledge which is important in figurative language understanding. Some aspects of my claims, therefore, may be at odds with Conceptual Metaphor Theory as classically formulated. Nevertheless, I emphasise that the importance and status of the notion of conceptual metaphor as a theoretical construct is maintained in the present account. I also argue that LCCM Theory is continuous with Conceptual Blending, conceived here, in terms of a research programme, rather than a defined theory with a single overarching conceptual mechanism, i.e., 'blending', in the sense of Fauconnier and Turner (2002). I also consider how LCCM Theory differs from, and complements, what is arguably the best developed theory of grammar in cognitive linguistics: Cognitive Grammar.

6.1. *Knowledge types involved in figurative language understanding*

The LCCM Theory perspective assumes that figurative language understanding involves a number of different knowledge types. I therefore begin with this.

One type of knowledge involves what have been termed primary conceptual metaphors (Grady 1997; Lakoff and Johnson 1999). These are hypothesised to be cross-domain conceptual primitives that arise automatically on the basis of pre-conceptual and universally-shared experience types. However, some of the proposed primary metaphors, e.g., what Lakoff and Johnson dub the Moving Observer and Moving Time metaphors may not, in fact be universal. Based on linguistic and gestural evidence, the Andean language Aymara appears not to have 'motion' based Ego-centred conceptual metaphors (Núñez and Sweetser 2006). While there are likely to be no more than a few hundred primary metaphors (Grady p.c.), much work still remains to establish the full set.

A second knowledge type involves what have been referred to as complex metaphors (Lakoff and Johnson 1999) or compound metaphors (Grady 1997, 2005). These are, in effect, complex bodies of knowledge arising through processes of conceptual integration (in the sense of Fauconnier and Turner). Hence, they are a type of (often very complex) blend. Specific proposals as to how these arise have been made by Grady (1997, 2005; and indeed Fauconnier and Turner, e.g., 2008; see also Evans To appear).

The common denominator in primary and complex metaphors is that they involve knowledge that is recruited from other regions of conceptual space, which is to say, from other domains of experience. In LCCM Theory I assume that primary and complex metaphors structure the cognitive models that make up a lexical concepts' cognitive model profile, as we shall see below. Hence, on the present account, conceptual metaphors (whether primary or complex), form part of the knowledge to which an open-class lexical concept potentially facilitates access. Hence, they form part of the conventional body of knowledge that is potentially invoked by any given lexical item during the process of figurative language understanding.

In addition to knowledge of this type, lexical concepts facilitate what I refer to as *semantic affordances*. Semantic affordances (elaborated on in more detail below) are the knowledge types that are immanent in the cognitive model profile, prior to additional structuring via conceptual metaphor. For instance, the lexical concept associated with the form *whizzed by* provides a number of possible interpretations that arise purely on the basis of the cognitive models to which it facilitates direct access (primary cognitive models), and indirect access (secondary cognitive models). These inferences constitute semantic affordances. Moreover, semantic affordances are activated during the process of (figurative) language understanding due to the operation of the normal pro-

cesses of lexical concept integration and interpretation, as mediated by context, as described above. For instance, semantic affordances potentially activated by the selection of the lexical concept [WHIZZED BY] might include 'rapid motion', 'a distinct audible sound', 'lack of detail associated with the object of motion', and 'limited durational elapse to observe object of motion', as well as many others. I argue (below), that semantic affordances, as well as relational structure recruited via conceptual metaphor, are both important in giving rise to the interpretation associated with any given open-class lexical concept during figurative language understanding.

In order to make more explicit the respective contribution of the types of knowledge just alluded to, I present below my assumptions regarding their respective contribution in figurative language understanding, before providing details of how this works in practice in the next section.

- *Assumption 1*: conceptual metaphors underdetermine (figurative) linguistic utterances.
- *Assumption 2*: Figurative semantic affordances arise when a lexical concept facilitates activation of aspects of a secondary cognitive model profile, due to clash resolution.
- *Assumption 3*: linguistically-mediated meaning construction *always* involves a linguistically-informed process of interpretation. In figurative language understanding this may involve activation of conceptual metaphors *and* semantic affordances.
- *Assumption 4*: conceptual metaphors (in LCCM Theory) provide a special type of knowledge structure which hold at the level of cognitive models: they provide primary cognitive model profiles with a level of structure which complements existing cognitive models (within a cognitive model profile).

I briefly elaborate on each of these assumptions.

Assumption 1: There are good grounds for thinking that conceptual metaphors, while part of the story, actually underdetermine the linguistic metaphors that show up in language use. For instance, consider the conceptual metaphor STATES ARE LOCATIONS. As I argue in previous work (Evans 2010)[19], this conceptual metaphor does not predict why there are different patterns in the sorts of 'states' that can be encoded by different prepositions in English:

(34) a. She is in love (cf. *She is on love)
b. The soldiers are on red alert (cf. *The soldiers are in red alert)

19. See Evans (2004: Ch. 4) for related arguments for the underspecification of linguistic temporal conceptions by conceptual metaphors for time.

That is, if the conceptual metaphor STATES ARE LOCATIONS directly motivated language use, we would expect both *in* and *on* to be able to encode states such as *love* and *red alert*. As I argue in detail in Evans (2010), the reason they cannot is due to the linguistic content of the lexical concepts specific to the forms *in* and *on*, and language use, rather than due to an over-arching conceptual metaphor. Of course, this does not preclude the existence of an overarching conceptual metaphor: STATES ARE LOCATIONS. And I assume the existence of conceptual metaphors, as discussed below.

Let's take another example. In previous work (e.g., Evans 2004: Ch. 4) I showed that conceptual metaphors in the domain of TIME underdetermine conventional patterns evident in language. Consider the following examples by way of illustration. They all involve the lexical item *time*, and a verbal complement relating to a motion event:

(35) a. The time for a decision has come [TEMPORAL MOMENT]
b. Time drags (when you're bored) [PROTRACTED DURATION]
c. Time flies (when you're having fun) [TEMPORAL COMPRESSION]
d. Time flows on (forever) [TEMPORAL MATRIX]

I argued in Evans (2004; see also Evans 2005) that the forms for *time* in each of these examples is conventionally paired with a distinct lexical concept (indicated in square brackets). Not only does the grammatical encoding associated with the lexical concept vary across the examples in predictable ways, so do the semantic arguments. That is, the semantic value associated with *time* in each example is paired with a restricted range of semantic arguments. For instance, the [TEMPORAL MOMENT] lexical concept for *time* can only collocate with motion events which involve deictic (and often terminal) motion. In contrast, the [TEMPORAL MATRIX] lexical concept, which relates to time as an ontological category (our conceptualisation of time as *the* event in which all other events occurs), can only occur with non-terminal motion events. Only certain types of motion events can collocate with specific types of temporal concepts. Importantly, the various conceptual metaphors for TIME that have been proposed in the literature do not predict this fact.

Assumption 2: A semantic affordance is an inference that is specific to a given lexical concept. It arises during figurative (and indeed non-figurative) language understanding. It is due to activation of (part of) a cognitive model to which the lexical concept facilitates access. A lexical concept can, in principle, facilitate activation of a vast number of semantic affordances, only constrained by the cognitive model profile to which it facilitates access. Moreover, a lexical concept can give rise to more than one semantic affordance in any utterance, a consequence of the extra-linguistic context (venue, time, interlocutors), the linguistic context, and the processes of meaning construction which apply.

To illustrate, consider the following utterances:

(36) a. Christmas is approaching
b. Christmas whizzed by (this year)

Conceptual Metaphor Theory, for instance, claims that the ego-centred conceptual metaphors for Moving Time (e.g., Lakoff and Johnson 1999; Moore 2006) allow us to understand (the passage of) time in terms of the motion of objects thorough space, thereby licensing these examples.

While these examples are no doubt, in part, a consequence of conceptual metaphors for time (for instance, in terms of their 'location' in time, as either being future, as with (36a) or past as with (36b)), the forms *approaching* and *whizzed by* give rise to distinct and distinctive semantic affordances. These cannot be predicted solely on the basis of the common conceptual metaphor that is meant to license these examples (in Conceptual Metaphor Theory).

For instance, the semantic affordance associated with the lexical concept [APPROACHING] relates to 'relative imminence'. The occurrence of the event in question, which in (36a) concerns Christmas, is construed as imminent. In contrast, the semantic affordance associated with [WHIZZED BY] in (36b) has to do not with imminence, but with the perceived compressed durational elapse associated with the observer's experience of Christmas. In other words, the semantic affordance relates to the phenomenological experience that, on the occasion referred to in (36b), Christmas felt as if it lasted for a lesser period than is normally the case. While the Moving Time conceptual metaphor (I argue below), allows the language user to apply relational structure from our experience of objects moving in space, and so interpret Christmas metaphorically as an object, part of the interpretation that arises also involves semantic affordances that are unique to given lexical concepts for motion. In other words, as the inferences just mentioned are specific to lexical forms, it is theoretically more accurate to assume that this aspect of meaning construction involves a bottom-up process: they arise due to activation of knowledge (i.e., semantic affordances) specific to the lexical concepts in question, rather than a top-down process of overarching conceptual metaphors.

Assumption 3: My third assumption is that conceptual metaphors and semantic affordances provide two complementary types of knowledge which are essential to figurative language meaning construction. LCCM Theory assumes that language use, and specifically figurative conceptions, draw on a number of different types of knowledge. These include purely linguistic knowledge, as well as conceptual knowledge. The semantic dimension of linguistic knowledge is modelled in terms of the theoretical construct of the lexical concept, which constitutes a bundle of different knowledge types as briefly described earlier (see Evans 2009b for full details). Conceptual knowledge takes different forms

and, as mentioned above, includes (at the very least) primary cognitive models, secondary cognitive models, and conceptual metaphors, which structure primary cognitive models in terms of structure recruited from other domains. As LCCM Theory takes a usage-based perspective, I assume that any utterance will always involve invocation of various knowledge types in producing a conception, including context of use. The difference, in terms of processing effort, associated with producing any given conception, is likely to be a consequence of the factors considered earlier in the paper, in particular salience and complexity.

Assumption 4: Finally, I assume that conceptual metaphors (in LCCM Theory) hold at the level of cognitive models. They structure the primary cognitive model(s) to which an open-class lexical concept facilitates access. This means that the cognitive model profile for a lexical concept such as [CHRISTMAS] has 'enhanced' conceptual structure. This lexical concept, for instance, potentially facilitates access to relational knowledge concerning the motion of objects through space. This allows language users to invoke inferences associated with objects in motion in order to understand temporal relations involving the relative 'location' in time of the temporal event Christmas. I illustrate, in the next section, as to how this might work in practice.

6.2. *The status of conceptual metaphors in LCCM Theory*

Thus far in this paper I have been dealing with how figurative conceptions arise. And I have done so without recourse to conceptual metaphors: stable cross-domain mappings which inhere in long-term memory (Lakoff and Johnson 1980, 1999). In this section I detail the status of conceptual metaphors in LCCM Theory, and specifically in the LCCM approach to figurative language understanding. In so doing, I attempt to illustrate the respective role(s) of conceptual metaphors and semantic affordances (the latter arising via clash resolution, in terms of figurative language understanding). Nevertheless, a caveat is in order. The ensuing analysis is meant to be indicative rather than definitive. Ongoing research within LCCM Theory seeks to establish the nature of the intersection between semantic affordances and conceptual metaphors in the domain of time. The proposals below should therefore be viewed as being programmatic, and may be subject to revision as the interaction between linguistic and conceptual knowledge in figurative language understanding becomes better understood.

To illustrate the interaction between conceptual metaphors and semantic affordances, I make use of (36a) which I revise as (37):

(37) Christmas is approaching (us)

Before discussing in more detail the conception associated with this utterance, and how this arises, I want to first focus on the cognitive model profile for [CHRISTMAS]. In particular, I focus on the way in which this cognitive model profile is structured by a conceptual metaphor.

The lexical concept [CHRISTMAS] facilitates access to a number of primary cognitive models, as illustrated in Figure 13. These include knowledge relating to Christmas as a CULTURAL FESTIVAL, including the exchange of gifts and other cultural practices. The second type of knowledge relates to Christmas as a TEMPORAL EVENT. This includes a whole host of temporal knowledge, as illustrated by the *attributes* and *values* associated with the TEMPORAL EVENT cognitive model—attributes and values are subsets of the knowledge that make up a cognitive model (see Evans 2009b for detailed discussion). For instance, part of our knowledge relating to a temporal event is that it can be situated in the PAST, PRESENT, and FUTURE. A further attribute relates to the nature of the durational elapse associated with the event, which is to say its DURATION. This attribute has a number of values associated with it. Moving from right to left, the first is TEMPORAL COMPRESSION—the underestimation of time, which is to say, the experience that time is proceeding more 'quickly' than usual. The second is SYNCHRONOUS DURATION—the normative estimation of time, which is to say, the experience of time unfolding at its (cultural and phenomenologically)

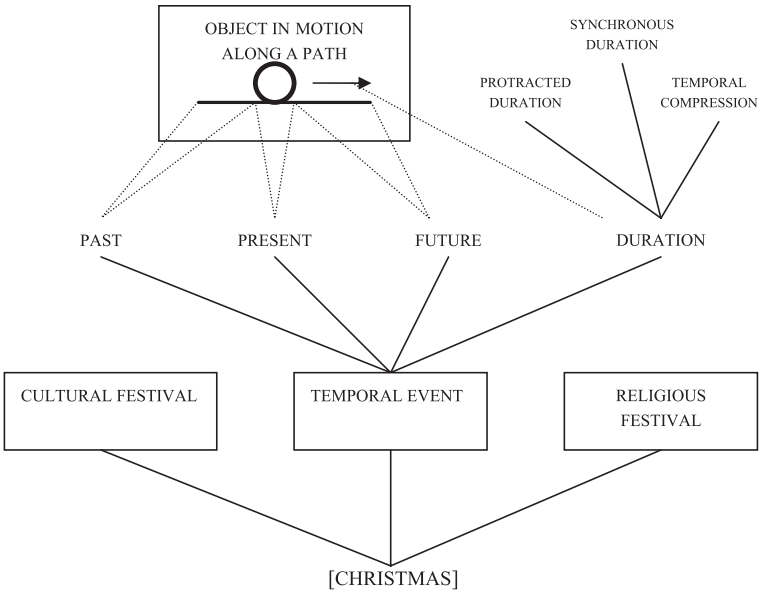

Figure 13 *Partial primary cognitive model profile for [CHRISTMAS]*

standard or equable rate. The final value is PROTRACTED DURATION. This relates to an overestimation of duration, which is to say the felt experience that time is proceeding more 'slowly' than usual. The final primary cognitive model diagrammed in Figure 13 is that of Christmas as a RELIGIOUS FESTIVAL. This relates to knowledge concerning the nature and status of Christmas as a Christian event, and the way in which this festival is enacted and celebrated.

In addition, the primary cognitive models for [CHRISTMAS] recruit structure from other cognitive models via conceptual metaphor. That is, as operationalised in LCCM Theory, a conceptual metaphor provides a stable link that allows aspects of conceptual content encoded by one cognitive model to be imported so as to form part of the permanent knowledge representation encoded by another. For instance, the primary cognitive model TEMPORAL EVENT is structured via a conceptual metaphor in terms of a stable, long-term link holding between it and the cognitive model relating to an OBJECT IN MOTION ALONG A PATH. As such, the cognitive model, OBJECT IN MOTION ALONG A PATH, which is represented in Figure 13 by virtue of a circle located on a path, with the arrow indicating direction of motion, provides the TEMPORAL EVENT cognitive model with relational structure concerning our knowledge of objects undergoing motion along a path. The conceptual content recruited via conceptual metaphor is indicated by the dashed lines.

Specifically, relational structure from this cognitive model is inherited by the PAST, PRESENT, and FUTURE attributes, such that content relating to the region of the path behind the object serves to structure, in part, our experience of pastness, conceptual content relating to the object's present location serves to structure, in part, our experience of the present, and content relating to that portion of the path in front of the object serves to structure our experience of futurity. This is indicated by the dashed lines which map the relevant portions of the path of motion from the OBJECT IN MOTION ALONG A PATH cognitive model onto the relevant attributes: FUTURE, PRESENT, PAST. In addition, content relating to the nature of motion is inherited by the DURATION attribute. Again this is captured by the dashed arrow, which links the arrow—signifying motion—with the duration attribute.

Now I return to addressing the figurative conception that arises for the utterance in (37). In Conceptual Metaphor Theory, this expression is held to be motivated by a conceptual metaphor, the so-called Moving Time metaphor (see Lakoff and Johnson 1999). From the LCCM perspective, an expression such as this involves, first and foremost, a sentence-level lexical concept which encodes what I refer to as a temporal frame of reference, or TFoR for short. Akin to spatial frames of reference (e.g., Levinson 2003; see also Talmy 2000), TFoRs are complex symbolic units, involving a form and an internally open closed-class lexical concept. Being internally open, the TFoR lexical concept can be integrated with other lexical concepts, notably [CHRISTMAS] and

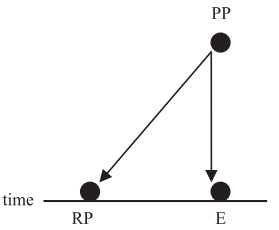

Figure 14. *Representation of the linguistic content encoded by [LOCATION OF EVENT IN TIME, FROM PERSPECTIVE OF EVENT]*

[APPROACHING], each of which facilitates access to cognitive model profiles. As noted above, I assume that conceptual metaphors operate at the level of cognitive model(s), providing an additional level of knowledge which lexical concepts, e.g., the temporal nominal lexical concept [CHRISTMAS], can activate during regular processes of meaning construction, as I explain below.

First, let's briefly examine the nature of the TFoR lexical concept which sanctions the instance in (37). The TFoR symbolic unit for (37) is given in (38):

(38) a. Form 'NP1 VERBAL COMPLEX OF DIRECTED MOTION (NP2)'
b. Lexical concept [LOCATION OF EVENT IN TIME, FROM PERSPECTIVE OF EVENT]

The lexical concept in (38b) encodes the following. There is an event (E) which is located in time with respect to an experiencer which serves as the reference point (RP). Additionally, the temporal location is viewed from the perspective point (PP) of the event. This can be represented diagrammatically as in Figure 14.

The linguistic content encoded by the lexical concept illustrated in Figure 14 is highly schematic in nature. It does not relate to the phenomenological experience of what it 'feels' like, for instance, to experience the passage of time. Nor does it encode phenomenologically rich notions relating to the experience of pastness or futurity. That is, this lexical concept simply encodes a relation holding between an event and the RP: the present. In other words, what 'gets into' language, so to speak, in terms of linguistic content, is a highly paramaterised version of temporal experience.[20] It says nothing about whether the event is located in the future or the past with respect to the RP. This rich inference emerges following interpretation, once open-class lexical concepts have been integrated with the TFoR lexical concept. For this reason, the time line in

20. See Evans (2009b) for discussion on the notion of paramaterisation in language.

Figure 14 has no directionality. In addition to this schematic content, the lexical concept also encodes details as to what types of lexical concepts and forms can fill the various slots that make it up. This I refer to as its *lexical profile*. This includes the following: NP1 must be a temporal event of some kind, and the optional NP2 (signalled by the parentheses in (37)) must be an experiencer of some kind. The verbal complex of directed motion must relate to motion events that can be construed as facilitating arrival at the experiencer. These include verbs of deictic motion, such as *come*, verbs of terminal motion, such as *approach*, verbal complexes involving increase in proximity, such as *get/move closer*, or verbs of motion which are manner-neutral, such as *move*, but which are paired with a path satellite of directed motion, such as *up on*, to give the verbal complex *move up on*, and so on.

In a typical conception arising on the basis of (37) three specific inferences arise which collectively make up the conception. These can be summarised as follows:

i) The utterance relates to a temporal scenario rather than one involving veridical motion.
ii) The temporal event of Christmas is located in the future with respect to our understanding of the present which is implicit, although not explicitly mentioned, in the utterance.
iii) The future event of Christmas is interpreted as being relatively imminent with respect to the present.

Let's consider how the processes of meaning construction developed in LCCM Theory account for these. And in so doing, we'll see the role conceptual metaphors play in the theory.

In terms of the first issue, I argue that the language user recognises the utterance as relating to a temporal scenario (rather than one involving motion) in precisely the same way as the idiomatic meaning of *He hit the roof* is instantly recognised. The existence of the TFoR lexical concept presented in (38b) is highly salient, in the sense discussed earlier—it is well entrenched in semantic memory. The existence of the lexical concept serves as a frame for interpreting the open-class lexical concepts—those associated with the forms *Christmas* and *approaching*—allowing them to achieve an informational characterisation relating to a temporal scene.

Turning now to the second issue, how is it that the utterance is understood as relating to a temporal event which is 'located' in the future? The answer, I suggest, relates to the existence of the ego-centred conceptual metaphor TIME IS MOTION OF OBJECTS (ALONG A PATH), aka Moving Time, which structures the cognitive model profile of [CHRISTMAS].

In terms of the inference arising from (37), that the event of Christmas is situated in the future, this is due to matching between the primary cognitive

model of [CHRISTMAS]—involving spatial content recruited via conceptual metaphor—and the primary cognitive model profile accessed via [APPROACHING]. That is, the conceptual metaphor structures the primary cognitive model TEMPORAL EVENT, providing it with relational structure recruited from a cognitive model relating to motion through space.

Hence, in terms of the utterance in (37), matching is achieved in the primary cognitive model profiles of both [CHRISTMAS] and [APPROACHING]. After all, due to the conceptual metaphor, [CHRISTMAS] facilitates access to relational structure derived from the motion scenario involving an object in motion. This knowledge forms part of the TEMPORAL EVENT cognitive model. This is matched with the kind of terminal motion accessed via [APPROACHING]. The cognitive model profile associated with [APPROACHING] involves motion towards an entity, and hence, the object in motion is in front of the entity with respect to which it is ''approaching''. As the FUTURE attribute of the TEMPORAL EVENT cognitive model accessed via [CHRISTMAS] is structured in terms of that part of the motion trajectory that is in front, there is a match. And the resulting match involves an interpretation in which the temporal event of Christmas is 'located' in the future. In other words, this particular interpretation is a consequence of a special type of matching I refer to as *conceptual metaphor matching*. Importantly, LCCM Theory assumes that in cases of conceptual metaphor matching, regular matching (as described in section 4.1) still takes place. In other words, conceptual metaphor matching involving primary cognitive models does not prohibit additional figurative semantic affordances arising on the basis of activation in the secondary cognitive profile of one of the lexical concepts undergoing matching (and clash resolution).

The third and final issue relates to the inference that the temporal event of Christmas in (37) is relatively imminent. This interpretation arises, I argue, due to the regular process of matching as described in section 4.1. above—the fact that conceptual metaphor matching has occurred does not preclude further matching. Matching, as guided by the previously introduced Principles of Interpretation, attempts to build an informational characterisation for [CHRISTMAS] and [APPROACHING] by first searching the primary cognitive models of both these open-class lexical concepts. As Christmas is a temporal, cultural, and religious event, and hence something that cannot undergo the sort of veridical motion implicated by the primary cognitive model profile associated with [APPROACHING], a clash arises. This necessitates clash resolution. Due to the Principle of Context-induced Clash Resolution, introduced above, [CHRISTMAS] is designated as the figurative target, and [APPROACHING] the figurative vehicle.

The consequence is that a search is established in the secondary cognitive model profile of [APPROACHING]. A very partial cognitive model for [APPROACHING] is provided in Figure 15. The cognitive model profile for

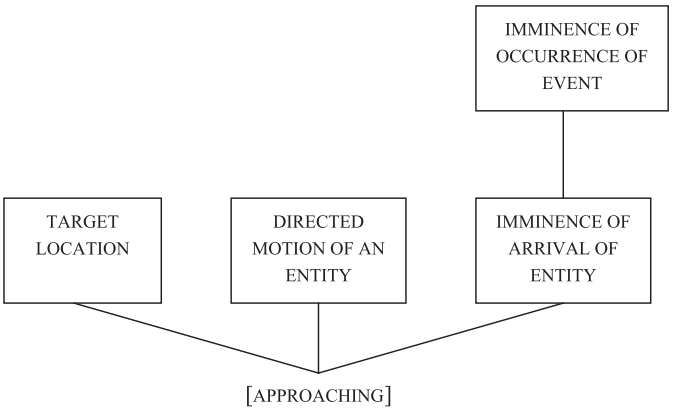

Figure 15. *Partial cognitive model profile for [APPROACHING]*

[APPROACHING] includes primary cognitive models for a TARGET LOCATION, the DIRECTED MOTION OF AN ENTITY, and THE IMMINENCE OF ARRIVAL OF AN ENTITY. A consequence of the relative imminence of arrival of an entity is the IMMINENCE OF OCCURRENCE OF EVENT, which is a secondary cognitive model. As a temporal event such as Christmas can occur, but not (literally) arrive, there is a match between the secondary cognitive model IMMINENCE OF OCCURRENCE of event and the primary cognitive model profile of [CHRISTMAS]. Hence, the interpretation of the imminence of the occurrence of Christmas is due to a semantic affordance arising, which results from clash resolution following regular matching.

This analysis reveals that the interpretation of (37) involves more than simply a conceptual metaphor. A number of different knowledge types are involved, and regular processes of meaning construction take place, as modelled by LCCM Theory. This involves understanding the temporal event as an object that can undergo motion (via conceptual metaphor), and hence its 'location' in the future, and understanding, through clash resolution that the type of motion involved implicates relative imminence of occurrence, achieved without recourse to conceptual metaphor—a semantic affordance.

6.3. *The relationship between LCCM Theory and Conceptual Blending*

Conceptual blending (Coulson 2000; Fauconnier and Turner 1998, 2002, 2008) is held to be a mechanism that is central to the way we think. It provides a means of integrating and compressing often very complex knowledge, typically in the process of ongoing meaning construction. Blending involves the setting up of an integration network, the purpose of which is to facilitate integration, and more precisely, the blending together of elements from a number

of distinct mental spaces (known as inputs). Knowledge from the inputs is projected to the blend selectively, in service of the particular inference or meaning under construction. This leads to a process whereby inputs contribute some, but not all, of their content. This *selective projection* of knowledge to the blended space is then integrated in a process known as *composition*. Once this has happened, the composed elements may require further knowledge being recruited to complete the blend that is emerging. This further process of knowledge recruitment is known as *pattern completion*. Finally, the blended space provides a means of allowing us to do inferential work. We can use the blend for ongoing reasoning, and can even extend and further elaborate the blend. This is known as *running the blend*.

The proposals provided in this paper can be construed as representing a detailed account of the linguistically-mediated mechanisms involved in composition: one of central drivers of conceptual blending. After all, linguistically-mediated composition presumably involves the activation of knowledge in ways that facilitate a coherent interpretation. The process of clash resolution, one of the symptoms of figurativity described in this paper, presents a mechanism for achieving integration of knowledge leading to coherence, and hence satisfying, in principle, the various goals and subgoals of Blending—although the way in which this might be achieved hasn't been worked out here.

That all said, meaning construction is exquisitely complex. While Blending Theory has attempted to provide a single well articulated and coherent account of meaning construction, it is highly unlikely, to my mind, that the range of phenomena claimed to exhibit conceptual integration, in the terms of Fauconnier and Turner (e.g., 2002), in fact arise from a single mechanism. For instance conceptual blending, a single unified mechanism, is held to be responsible for phenomena as diverse as neurological binding, solving riddles, performing mathematic calculations, to the creation of novel word, and word compound coinages, as well as grammatical constructions. While these phenomena involve integration of some kind, it is far from clear that a single set of mechanisms and unified principles can adequately account for the range of knowledge types, and neurological mechanisms involved. In view of this, I suggest the following. If we allow blending to be interpreted more broadly as a research programme (rather than a theory), language (and cognitive) scientists are provided with a fresh and an important perspective for investigating meaning construction. The truly notable finding that arises from Fauconnier and Turner's research on blending is that integration does indeed appear to be ubiquitous: it is central to the way we think. It is in this spirit that LCCM Theory is put forward.

The LCCM perspective offered in this paper, presents a reasonably detailed first pass at accounting for how knowledge accessed via linguistic inputs undergoes composition, in service of figurative meaning construction. Linguistically-

mediated composition, as studied here, is one of the (probably many) 'compositional' integration types that are necessary to produce meaning. The other salient integration type identified by Fauconnier and Turner is referred to as pattern completion (which itself is probably a complex category of different types of integration). Thus, LCCM Theory represents an attempt to model one specific type of composition, which is one type of integration. It forms part of what is envisaged to be a large-scale study of integration mechanisms involving linguistic and other types of knowledge, in producing meaning.

6.4. *LCCM Theory and Cognitive Grammar*

I now briefly consider the way in which LCCM Theory is distinct from Cognitive Grammar (e.g., Langacker 1987, 1991, 2008). I address two specific issues: theoretical focus, and encyclopaedic semantics. I argue that LCCM Theory has distinct (albeit complementary) theoretical foci. It also provides, I argue, a nuanced perspective on the approach to encyclopaedic semantics advocated by Cognitive Grammar.

Cognitive Grammar represents an attempt to develop a cognitively-realistic account of grammatical representation and structure. In so doing, Cognitive Grammar develops an account of the way linguistic units—what are referred to as symbolic units—are integrated in producing larger grammatical units. This account assumes a central role for semantics in grammatical compositionality. Langacker argues that grammatical structure arises due to a distinction between conceptually independent and conceptually dependent lexical structures. Conceptually dependent lexical structures are relational in the sense that they have schematic trajectors (TRs) and landmarks (LMs) which form part of their semantic representation. The distinction between a TR and an LM relates to a distinction in focal prominence in what Langacker refers to as a *profiled relationship*. Profiling concerns the attribution of attention to a particular entity or relationship by virtue of encoding in language. To illustrate, consider the utterance in (39):

(39) The boy smashed the vase

The TR relates to the participant in the relationship being profiled which receives focal prominence. That is, in (39) the TR is the participant designated by *the boy*. In contrast, the LM is the participant in the profiled relationship which receives secondary prominence. In (39) the LM corresponds to the entity designated by *the vase*. One consequence of this is that what counts as a TR or an LM is encoded as part of linguistic content by the relational or conceptually dependent lexical concept (e.g., *smashed*), rather than the conceptually independent or nominal lexical concepts (e.g., *boy*, *vase*). To illustrate consider (40).

(40) The vase fell

In this example *the vase* corresponds to the TR. This follows as it occupies the schematic TR slot encoded by the relational lexical concept associated with the form *fell*. Langacker refers to the schematic TRs and LMs encoded by conceptually dependent lexical concepts as *elaboration sites* (or *e-sites* for short), and the profiling of these e-sites as *elaboration*. From the perspective of Cognitive Grammar, then, compositionality is a consequence of conceptually dependent lexical concepts becoming elaborated by nominal lexical concepts which are conceptually autonomous.

This is not the whole story, of course. Any cognitively realistic account of compositionality must provide an account of how the level of semantic structure that is encoded by language, or that results from the integration of grammatical structures, as in the case of elaboration in the sense of Langacker, interfaces with what I refer to, in LCCM terms, as conceptual content. In Cognitive Grammar, this latter level of semantic representation is broadly referred to as encyclopaedic knowledge.

Langacker argues that words directly encode what I operationalise in terms of conceptual content. Conceptual content is modelled, in Cognitive Grammar, in terms of a theory of conceptual domains, with a word designating a profile against some base, which relates to a subset of some domain or domains. Yet, not only is the notion of a domain not worked out in any great detail, it is not clear how the result of integration at the linguistic (or grammatical) level then interfaces with this encyclopaedic knowledge at the level of an utterance in order to produce an utterance-level meaning: a conception. That is, it is not clear how this level of knowledge representation interfaces with the linguistic or grammatical level, and what the mechanisms are whereby structure from the perceptually rich domains becomes incorporated with grammatical structures.

To be fair to the account developed by Langacker, the model he develops is not primarily concerned with the details of semantic composition. Rather, he is primarily exercised by attempting to develop a semantically based account of linguistic organisation and structure (a 'grammar'), which can account for issues such as constituency, and the combinatorial properties of the formal aspects of language.

In view of this, LCCM Theory can then be seen as complementing the research perspective provided by Cognitive Grammar's account of grammatical organisation. LCCM Theory diverges from Cognitive Grammar in that it *is* concerned precisely with the nature of semantic representation, as well as the mechanics of semantic composition. Moreover, given its foundational assumption that semantic structure and conceptual structure constitute distinct kinds of representation, it follows that I posit two distinct processes of composition:

lexical concept integration, which relates to fusion of linguistic content, and interpretation, which concerns fusion of conceptual content.

I now briefly address the thesis of encyclopaedic semantics. More than any other researcher in cognitive linguistics, Langacker (1987, 1991, 2008) has been responsible for developing this thesis. He does this in adducing a *conceptual semantics* that underpins his theory of Cognitive Grammar. Langacker's view of encyclopaedic semantics is based on two assumptions: (i) that the semantic structure associated with words directly accesses conceptual structure, and (ii) words and other symbolic units cannot be understood independently of the larger knowledge structures, the encyclopaedic domains of conceptual knowledge, to which words serve as *points of access*. In essence, Langacker's claim is that semantic structure is equivalent to conceptual structure; that is, the semantic structure associated with a lexical form *is* conceptual structure.

LCCM offers a somewhat nuanced perspective. On my account, the thesis of encyclopaedic semantics oversimplifies matters. It blurs the boundaries between linguistic and conceptual knowledge. While marking such boundaries may not be necessary in Cognitive Grammar, for instance, which is ultimately concerned with accounting for formal properties of linguistic organisation, such a situation is unsatisfactory when attempting to account for the role of language in meaning construction, and specifically, figurative language understanding, as I am doing in this paper.

The claim at the heart of LCCM Theory, and one enshrined in the distinction between its two foundational theoretical constructs—the lexical concept and cognitive model—is that what has, in cognitive linguistics, been treated as two qualitatively distinct, albeit related, aspects of semantic structure—schematic versus rich aspects of semantic content, as described, for instance, by Talmy (2000) in his distinction between content encoded by open and closed-class forms—in fact relates to very different types of representation that constitute different kinds of knowledge. While these two knowledge types interact in order to produce simulations, they nevertheless constitute different knowledge formats.

7. Conclusion

This paper has been concerned with an LCCM account of figurative language understanding. This account relates to the role of language in figurative language understanding and the way in which it interfaces with non-linguistic knowledge. A consequence of meaning construction mechanisms proposed by LCCM Theory is the assumption that literal and figurative language arise from the same compositional mechanisms. They can be seen as points lying along a continuum of meaning construction, rather than being due to wholly different mechanisms. Analogously, metaphor and metonymy, as two particular exem-

plars of figurative language use can be seen, from this perspective, as arising from similar meaning construction processes, differing in terms of the way meaning construction occurs. The key assumptions associated with the LCCM approach to figurative language can be summarised as follows:

i) there is continuity between figurative and literal language
ii) there is continuity between metaphor and metonymy
iii) figurative language understanding is a consequence of the nature of semantic representation and semantic composition, which is to say, essentially the same structures and processes as for literal language.

One of the motivations for the development of the LCCM Theory account in this paper has been to develop a 'joined up' cognitive linguistic account of figurative language understanding. This endeavour should be situated, I argue, within the perspective of seeking to account for conceptual integration in producing meaning. The two most influential theories of figurative language in cognitive linguistics are Conceptual Metaphor Theory and Conceptual Blending Theory. Yet both these approaches are concerned with (different aspects of) backstage cognition: stable knowledge structures in the conceptual system (in the case of conceptual metaphors), and dynamic aspects of meaning construction (in the case of conceptual blending). What is missing is a frontstage cognition perspective, one that takes account of the sophisticated nature of linguistic information encoded in language, and the way in which it interfaces with non-linguistic knowledge during meaning construction. This is what the LCCM project seeks to redress.

Moreover, both backstage cognition accounts are sometimes presented as being competing. For instance, Lakoff (2008) argues that there is not a dedicated process of Blending in the brain. For their part, Fauconnier and Turner (2008) claim that (even the most basic) conceptual metaphors may arise due to (a dedicated process of) Blending.

For his part, Lakoff is probably right. The range of knowledge types and the processes involved in meaning construction are exquisitely complex. It is highly unlikely that the range and diversity of different types of knowledge, and the various ways in which they can be combined, follow from a single unified process, as proposed by Blending Theory. Yet, in identifying a programmatic framework, Fauconnier and Turner have made a significant contribution in focusing the challenge that lies ahead. By developing their Blending framework, they have provided future researchers with a handle on the nature of the challenge, which allows us to begin to model the (probably) many different types of integration involved in meaning construction. And just as Lakoff is partially right, so too it is with Fauconnier and Turner. Save for a relatively small number of primitive conceptual metaphors, probably much of the (stable) knowledge that populates our conceptual systems is constructed through

regular processes of meaning construction. The challenge remains to identify these processes. Fauconnier and Turner (2002), interpreted as providing programmatic proposals, have made an important start in this endeavour.

In the final analysis, the 'impoverished' linguistic prompts that language users deploy in meaning construction are impressively sophisticated. The LCCM perspective attempts to reconcile the impulse to focus on backstage processes with an awareness of the complexity apparent in language. It also seeks to examine the linguistic processes involved in semantic composition, including how linguistic prompts signal which aspects of non-linguistic knowledge are activated in linguistically-mediated meaning construction: a frontstage cognition perspective. I argue that this perspective complements and is necessary to develop a fully-fledged 'science of integration'. To build on the achievements of Lakoff, and Fauconnier and Turner (as well as others) holds out the possibility of a mature cognitive linguistic approach to the linguistic and non-linguistic mechanisms of integration. It is these mechanisms which underlie (figurative) language understanding, and which ongoing and future work must aim to model.

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