Metaphors are Conceptual Schemata that are Emergent Over Tokens of Use*

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This paper presents the view that metaphors are conceptual schemata that emerge, for individual speakers, over metaphorical tokens of use to which they are exposed, and that the conceptual structures which comprise metaphor are subject to frequency effects. The theory posits that metaphorical conventionalization, at the level of both conceptual metaphors and particular expressions, reflects the operation of linguistic frequency effects. Key properties of metaphor—the unevenness of metaphorical mappings, the gradedness of metaphor, idiosyncracy of meaning for individual expressions, and the emergence of metaphorical ability in children—are accounted for in an exemplar theory-based model of emergence for metaphorical schemata. It is asserted here that a usage-based view of language, and the tools of an approach whereby language processing and storage are seen as driven by frequency effects, provide the best lens for understanding the properties of metaphor in all of its types.

Key words: Emergent Metaphor Theory, metaphor, frequency, conventionalization, exemplar, schema, emergence

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1. Introduction

The field of metaphor research, while developing out of the cognitive tradition, has been largely constrained by a generative approach to thinking about how rules license expressions. As understood within Conceptual Metaphor Theory (CMT), the connection between underlying metaphors and specific, metaphorically predicated utterances mirrors the connection between competence and performance (Chomsky 1965, 1980) in that metaphors are understood as ‘deep’ structures from which the surface-level properties of metaphor are derived. A common goal within metaphor research has been to enumerate the underlying rules (metaphors) that account for metaphorical utterances that seem like natural sentences to language researchers, whether or not they are attested in natural discourse (to take one commonly cited example, *Her arguments were right on target*, as well as any simple variation thereof with respect to pronoun, number and tense, is unattested in the 365+-million-word Corpus of Contemporary American English [Davies 2008]). Generative approaches stress the unfathomable number of sentences and meanings that language is capable of expressing. Corpus methods, however, have given linguists insight into the fact that humans don’t say anything and everything: they repeat the same things, the same chunks and phrases and constructions and sequences, over and over again (Renouf & Sinclair 1991, Renouf 1992, Erman & Warren 2000, Wray & Perkins 2000). The same is true for metaphor. When corpus methods are brought to bear, the striking feature of metaphor is not the productivity of conceptual metaphors—far from it. Rather, the same words and expressions, with the same figurative meanings, are repeated over and over (Deignan 2005, Sanford 2008a).

While CMT and approaches inspired by it have yielded countless extremely valuable insights into the nature of metaphorical systems that can and should inform subsequent iterations of metaphor theory, such insights have tended towards cataloguing the properties of metaphor, rather than explaining them. Emergent Metaphor Theory asserts that the properties of metaphor and of metaphorical systems are best understood as emergent phenomena, products of fundamental aspects of human cognition. Individ-
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ual metaphors, and their roles within groups of related metaphors, are best understood as entities that arise out of language in use. Many properties of metaphor that have proven difficult to handle in CMT and other approaches to metaphor can be more clearly understood when the facts of language use, rather than underlying structures, are viewed as basic.

The argument is presented here that a usage-based approach to metaphor accounts directly for many key properties of metaphor with respect to conventionalization. Other properties of metaphor, including ‘families’ of metaphors, are not only compatible with this view, but can be viewed as emergent phenomena, arising out of a view of metaphorical structure as deriving from usage, and of metaphors themselves as schemata which are emergent over experienced metaphorical tokens of use. The phenomenon being identified here as metaphor is consistent with the Lakovian view of metaphors as conventionalized cross-domain mappings, which can be realized in metaphorical utterances. The nature of the relationship between metaphor and metaphorical utterances, is, however, argued to be more complex, and metaphorical mappings more dynamic, than they are presented in Conceptual Metaphor Theory.

2. Conventionalization: metaphor and frequency

The position taken here is that metaphorical conventionalization results from frequency effects, and that an exemplar-based model of storage best captures the mechanism whereby metaphorical schemata are stored and processed. §§ 2.1 and 2.2 briefly outline the usage-based, frequency-informed model of language, and the exemplar model, respectively.

2.1 Frequency

Emergent Metaphor Theory, in that it posits repeated units of speech as the units of storage and processing, is an explicitly usage-based approach. In a usage-based account of language (Greenberg 1966, Bybee 1985, Langacker 1987, Croft & Cruse 2004, Givón 1984, Hawkins 1994, Lindblom, MacNeilage, & Studdert-Kennedy 1983), linguistic performance isn’t a byproduct of underlying abstractions, a priori constructs which comprise Language and of which utterances are merely indicative. Linguistic repre-
sentations, rather, are seen as directly operated upon by tokens of linguistic expression, with frequency the engine whereby expression dictates representation. The traditional units of linguistic analysis (segments, syllables, morphemes, words, constructions, etc.) aren’t the building blocks of language. They are, rather, entities which emerge as generalizations, abstracted away from sequences to which language users are repeatedly exposed, leading to the emergence of organizational schemata and categories. An experienced linguistic event is stored as a mental representation of the event, and for any given category, those units which are most frequently experienced become strengthened, with a concomitant increase in productivity for patterns they instantiate, while infrequently experienced tokens are correspondingly weak.

Frequency can be counted in two ways: token and type. Token frequency is the raw frequency of a given unit: given a particular unit (at any level of linguistic structure), the frequency with which it occurs in a corpus (as a measure of how frequently it is experienced by a language user) is its token frequency. Type frequency, on the other hand, refers to the frequency of a pattern, or more specifically, the number of items within a language that instantiate the pattern in question. Bybee (2001) gives, for example, the case of *break*. The number of times that the form *broke*, the past tense of *break*, occurs in a corpus would be the token frequency (as indicated by the corpus) of *broke*. A relevant measure of type frequency, on the other hand, would be to assess the number of verbs that form the past tense using the same vowel alternation as that used in *broke* (e.g., *spoke, awoke*). The type frequency of this form of the past tense would be considerably lower than that of forms which use the *–ed* ending—that is to say, the pattern applies to a much smaller set of words.

Strengthening of representations (referring to an increase in their cognitive salience) can take place at either the type- or token-frequency level. High token frequency for a particular item causes the representation of the item to be strengthened, while high type frequency causes a pattern (or schema) to be strengthened. The past tense pattern *–ed*, for example, is high in type frequency. The form *weeped* is increasing in usage because of the low token frequency of *wept* relative to the high type frequency of the *-ed* past tense. The form *kept* remains prevalent, on the other hand, because
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of its high token frequency (Bybee 1985). The relationship between token frequency, type frequency, and productivity is such that a schema of high type frequency is a strong, and therefore, productive, schema. The openness of a schema—the amount of specificity imposed—also plays a role in the strength of the schema, such that open schemata tend to be higher in productivity than more restrictive ones. High frequency tokens within a schema do not contribute to the frequency of the schema, because they tend to become independent (autonomous) from it, forming their own representations rather than reinforcing the pattern (as is the case for *kept*, for example) (Bybee 1995). Thus, generally, type frequency correlates positively with productivity, but high token frequency will effect an inverse correlation between the two.

2.2 Exemplar Theory

Exemplar Theory is one of a number of theories which have emerged out of psychology in the last three decades which take as central the view that categories are not discrete entities, comprising sets defined by criteria of membership, but rather are structured around a ‘core’ at which resides the best example(s) of the category. Exemplar Theory (Brooks 1978, Estes 1986, Hintzman 1986, Medin & Edelson 1988, Nosofsky 1986) differs most notably from prototype theory (Berlin & Kay 1969, Dirven & Taylor 1988, Lakoff 1987, Rosch 1973), with which it nonetheless shares many of its central assumptions, in that while prototypically defined categories are structured around a single central member which may or may not be an actual, experienced instantiation of the category, categories in the exemplar model are “cloud[s] of remembered tokens of that category” (Pierrehumbert 2001: 140). All members of a given category correspond to experienced events, and the group of remembered tokens which has the highest frequency, and is therefore strongest (with a corresponding effect on productivity), is at the core of the category.

An exemplar model departs from a prototype model in that “all perceived tokens are categorized and stored, creating categories that directly represent the variation encountered” (Pierrehumbert 2001, p.51). The gradient nature, then, of linguistic categories, such that a particular segment can have many possible phonetic expressions, and the internal structure of categories such
that certain ranges of parameters correspond to what individuals deem ‘best’ members of a category, aren’t incidental features of language. They are, rather, natural results of the way in which language is experienced, perceived, and learned.

In the application of exemplar theory to language processing and storage (Pierrehumbert 2001, Croft 2007), categories emerge from the repetition of units in the continuous stream of linguistic data to which we are exposed in daily life—segments, morphemes, words, and constructions (as well as, it’s argued here, metaphors). For any given category, those units which are most frequently experienced become strengthened, with a concomitant increase in productivity for schemata they instantiate, while infrequently experienced tokens are correspondingly weak.

The exemplar model provides the mechanism by which emergence takes place: every token of use is stored, its proximity to other tokens determined by its similarity to them. The strength of an exemplar increases as frequency increases. It is, therefore, those units which tend to repeat themselves in speech that get stored most effectively, and units of different sizes (features, segments, syllables, words) emerge as a result of redundant storage: both relatively smaller and relatively larger units repeat themselves, with smaller units occurring within larger ones.

2.3 Metaphors as Schemata

Langacker (1987) presents schemata as abstractions over semantic, phonological, or otherwise symbolic units, which can in turn sanction specific instantiations of the schema (as, for example, the word ‘tip’ instantiates the phonological CVC schema). Bybee (1995) defines schemata as “emergent generalizations” over “[units] having similar patterns of semantic and phonological connections” (p. 430). Emergent Metaphor Theory builds on two seminal studies, Allbritton, McKoon, & Gerrig (1995) and Clausner & Croft (1997), in identifying the conventionalized cross-domain mappings of CMT with conceptual schemata.

Allbritton, McKoon, & Gerrig (1995: 614) suggest that “conceptual metaphors can provide a schema-like structure for organizing information about a topic.” Building on Gibbs and associates’ research on the active role of metaphor in motivating the meaning of common idioms (Gibbs 1994, Gibbs
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& O’Brien 1990, Gibbs, Bogdanovich, Sykes, & Barr 1997), they report a series of experiments in which recognition priming was used to “assess the degree to which elements of a text representation were associated with one another in memory” (p. 613). Associations between items related by a metaphorical schema (and otherwise semantically unrelated) caused subjects to recognize words and sentences faster when the metaphorical schema motivating their figurative meaning had been previously activated. Thus, for example, “the sentence ‘Public officials desperately searched for a cure’ would be interpreted as being related to the Crime is a disease schema when presented after sentences about an increase in crime … but not if it followed a sentence about police officers contracting pneumonia” (p. 613).

According to this line of research, pre-existing metaphorical schemata are activated by utterances instantiating the schema, and activation of the schema spreads across the semantic domains related by the schema. The operation of priming effects across domains that are semantically related only by a metaphorical mapping (for example, crime and disease) provides dramatic evidence for schemata that operate across conceptual domains.

Clausner & Croft (1997) develop the idea of metaphorical cross-domain mappings as schemata further, asserting that schematicity, defined by Langacker (1987) as the extent to which precision and detail are characterized for a given schema, is an essential parameter for understanding a given metaphor, and prerequisite to assessing said metaphor’s productivity. In their application of schemata to metaphor, Clausner & Croft define a metaphor’s degree of schematicity as “The range of concepts characterized by a domain mapping schema” (p. 257). The proper statement, then, of the schema which sanctions a given family of linguistic metaphors will be maximally productive, while being as specific as possible. Only once schematicity has been assessed can a metaphor’s productivity—“the proportion of a schema’s range which can be instantiated as expressions” (p.257), and effectively the range of expressions that can be licensed by the metaphor (i.e., its type frequency, as per Bybee 1985)—be addressed, a claim in keeping with Bybee’s (1995) view of a schema’s productivity as dependent on its defining properties and strength. Individual metaphors can exist anywhere along a continuum of productivity, marked at one end by Lakovian conceptual metaphors and at the other by opaque idioms. Clausner & Croft (1997)
offer the examples of *this argument is sound*, instantiating a conventional evaluation of arguments in terms of structural soundness, and the opaque *kick the bucket*, respectively. The gradient productivity of metaphors is offered as the primary form of evidence for conceptual schema, and for metaphorical cross-domain mappings as generalizations arising over metaphorical utterances.

### 3. Conventionalization, Entrenchment, and Metaphorical Systems

Schemata form over units that tend to both co-occur and re-occur, with items that consistently occur alongside one another emerging, via repetition, as salient units of speech and in turn as the stored units of language. In Emergent Metaphor Theory, the units which co-occur are domains of thought corresponding to Lakovian conceptual domains, which emerge from categories of experience. These units are semantic, as opposed to phonological, morphological, or syntactic, and the co-occurrence is simultaneous rather than sequential (as in the common co-occurrence of *do not* or *going to*). They are no less governed than schemata at other levels, however, by principles whereby frequency affects storage.

In the application of exemplar theory to metaphor, tokens of experienced linguistic metaphor that profile the same aspect of a cross-domain mapping reinforce one another, forming exemplars corresponding to a linguistic metaphor that links a specific lexical element to another specific lexical element (for example, *surgeons* to *butchers*). Categories form over exemplars based on semantic categories to which these lexical elements belong (for example, *he’s a peach and she’s an old prune* might be candidates, should a critical mass of exemplars be reached instantiating the mapping, for a category of utterances linking people to fruit). Many categorizations form over many types of utterances; those which result in metaphorical schemata are those with the schematic form [TARGET] IS [SOURCE], where TARGET and SOURCE correspond to semantic categories.

The examples that follow demonstrate a variety of types of metaphorical utterances, and will serve here as a shorthand for the variety of instantiations of metaphor to which speakers are exposed.\(^1\) 1) and 2) are lexical

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\(^1\) Examples used in this section are taken, unless otherwise indicated, from either
metaphors, with the metaphorical meaning for the utterance carried by a single (here, italicized) word. 3) through 6) are metaphorical idioms, expressions with a set meaning that doesn’t strictly follow from the rules of compositionality. 7) through 10) are formulaic metaphors, metaphors the overall meaning of which draws not from the wide range of possibilities for meaning that arise when a source is applied to a target, but rather a single, narrow interpretation. 11) through 13) are all novel metaphors, which either explore a new aspect of an existing mapping, or posit an altogether novel connection between domains.

(1) She’s hot.
    COCA 2007, ‘Brooklyn Bar Serves Opera on Tap’

(2) Who could doubt a sweet little old lady?

(3) All right, so Jack had jumped the gun a little, buying this thing.
    COCA 2008, ‘Just Breathe’

(3) Each time you think you’ve got one thing figured out, they throw you a curveball.
    COCA 2002, ‘Rebranding the Hyena’

(5) It’s raining cats and dogs out there, tonight.
    COCA 2007, ‘Guy in the Sky’

(6) But that’s neither here nor there.
    COCA 2009, ‘Evie Ever After’

(7) Men are dogs.
(8) For a boy she’s kind of cute, but for a girl she’s a dog.

(COCA 2000, ‘Fiction Crushed’)

(9) She’s a fox.

(COCA 2009, ‘Star Tracks’)

(10) That surgeon is a butcher.

(Turner & Fauconnier 2002)

(11) He was like a little Australian sheepdog, running around.

(SBCSAE Text 6, lines 794-799)

(12) Those tables are museums, could you please, chill out in the uh, art work here.

(SBCSAE Text 6, lines 523-527)

(13) Human nature does not possess free will. It is like a horse. Ridden by God or the Devil. The rider possesses the will. The horse obeys.

(SBCSAE Text 25, lines 175-183)

Speakers, as they engage in language in any mode, encounter linguistic metaphors. As tokens such as 1)–13) accumulate, they form exemplar representations and are stored on the basis of similarities with other items. Similarity judgments forming along one parameter in no way exclude categorizations forming along another with the resulting categorizations (and, eventually, schemata) being highly redundant. Items 1, 2, 7, 8, 9, 10, 11 and 13 comprise a category of items referring to people; items 5, 7, 8, 9, 11, and 13 a category of utterances that draw on animals as a source. Items 7, 8, 9, 11, and 13 are utterances that draw an animals as a source, and refer to people. Effectively, this last category is the intersection of the first two sets, but this should not be taken to imply a hierarchical organization, such that it is a special case of either of the first two categories, or that in on-line processing the third set is a function of a logical operation upon the first two. Rather, items are added
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Schemata form as speakers, within categorizations, make connections over exemplars. Bybee (1985) developed the system of representing such identity relationships as lines indicating associations between items. Such associations develop over each of the above three categorizations, as speakers identify semantic elements of each utterance as belonging to the emergent categories of PEOPLE and ANIMALS. For the class of utterances where both elements are present, identity relationships form across both categories.

Figure 1 shows a schema emerging (over items 7, 8, 9, 11, and 13) in which humans are being equated to animals. Based on semantic properties in common to all items within the cluster of tokens, the speaker generalizes a pattern. Tokens are analyzed based on the schema, with specific elements in the clause being equated to one of the two semantic elements. An explicit

Figure 1. Conceptual schema: PEOPLE ARE ANIMALS

3 The number of distinct tokens necessary for a schema to form is an open empirical question, and the presentation of Figure 1 should not be taken as implying that (for any given $x$) $x$ tokens accumulate within a category before a schema can be formed. Once a schema does emerge, subsequent tokens are linked to the schema.
comparison need not be made in order to serve as a basis for similarity comparison, as it’s not words that generalizations form over, but domains. In the *horse obeys*, from example (18), people are described as horses implicitly. A comparison of horses to people is made nonetheless.

At this stage, a cross-domain domain mapping has effectively formed. PEOPLE ARE ANIMALS, as it accurately captures the identity relationships that link the relevant tokens, is the optimal statement of the metaphorical schema. Further tokens of utterances equating people to animals will be analyzed according to the schema, each iteration strengthening the schema as its type frequency increases. In proportion to the strength of the schema, new tokens’ semantic acceptability will be judged according to their semantic proximity to, as well as the strength of, the prototype, and processed more quickly than items not sanctioned by a schema or sanctioned by a less entrenched schema (Pierrehumbert 1994, Vitevich et al. 1997, Hare et al. 2001, Bybee & Eddington 2006, Wilson 2009). The schema may take on idiosyncratic properties, such as is certainly the case here—Kovecses (2002), who originally noted PEOPLE ARE ANIMALS, observes the tendency of the metaphor to attribute, via animal terminology, negative attributes to humans (e.g., *boor, swine, pig, cow, vermin*). Most critically, the schema becomes a template for creating new utterances. Speakers referring to given topics metaphorically are likely to choose source terms based on the relative strengths of attested metaphorical schemata that involve the target. Within a speech community, other language users will have encountered the pattern at similar levels of frequency, and a metaphorical utterance produced based on a schema deeply entrenched for a speaker is likely to be deemed semantically acceptable, and interpreted with ease, by a listener for whom the schema is similarly entrenched. At the point that such a schema has become entrenched across many speakers, and pervasive within a speech community, a Lakovian Conceptual Metaphor has essentially formed. Critically, however, the direction of causation is precisely the reverse of what is proposed in Conceptual Metaphor Theory. Instantiations don’t just follow from underlying conceptual metaphors, they are, rather, integral to the process by which such mappings arise.

The model outlined here takes the perspective of an individual language user, with a history of use of the language developed through exposure
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Metaphors are Conceptual Schemata that are Emergent Over Tokens of Use. Schemata at all levels, including conceptual, form as language users make generalizations over recurring patterns. A metaphor can’t be properly said to exist until a schema such as the one in Figure 3 has emerged, but in that case, what metaphor motivated she’s a dog or the horse obeys in the act of language use to which our speaker was exposed? Another schema, in another language user’s mind. Every speaker recreates the language anew, based on exposure to the language: the only option, unless language is to be treated as an abstract system rather than as a being rooted in the mind of an individual. It does seem worthwhile, however, to point out that from a diachronic perspective, there is a chicken-or-the-egg question to be addressed: there must have been some original emergence of PEOPLE ARE ANIMALS (or of any other schema). But how it could it arise, when there were no utterances for it to form over? There are two options: the first is that a schema can emerge due to reanalysis of tokens of other schemata. The other is that analogical reasoning can and does create wholly novel metaphorical utterances (although existing schemata will some play a role in determining its acceptability), over which schemata then form.

The issue points towards the question (and potential criticism) of circularity of argument: frequency has an effect on the storage and processing of metaphor, and the entrenchment of metaphorical schemata have an effect on their usage—and, accordingly, their frequency. The circularity isn’t however, in the argument: it’s in the phenomenon, and such circularity— or, to call by its right name, reinforcement—is a fundamental feature of self-organizing systems. Washboard gravel roads provide a good example. Dirt and gravel roads, when travelled by motor vehicles, don’t erode evenly, subject to a pattern of general wear. As a vehicle travels down a newly laid gravel road, any irregularities in the surface of the road cause an oscillating motion in the vehicles’ suspension, resulting in an increase in erosion with every release stroke of the suspension, and a corresponding pattern of peaks and troughs in the surface of the road. These initially miniscule variations themselves become the irregularities that the next vehicle reacts to, and the suspension of each car that passes along the road reacts to the peak with a compression, and a release of corresponding amplitude into the following trough. Over time, the pattern is reinforced until a road becomes, without
maintenance, undrivable. To return to metaphor: does the frequency of a metaphor affect the likelihood of its use, or is frequency symptomatic of a metaphor’s viability? Most certainly, both. The system is self-reinforcing, showing a snowball effect as metaphors reinforced by frequency are more easily accessed and produced more readily, thereby increasing further in frequency.

§s 3.1–3.7 look at key properties of metaphor and of metaphorical systems, accounting for how these properties are accounted for within EMT.

3.1 Idiosyncratic Interpretations, Autonomy
A metaphorical schema, once formed, is not a static entity. Frequency effects are on-going, and metaphorical schemata differ from one another in strength by virtue of speakers’ continued exposure to language, and to tokens that instantiate different schemata. Moreover, frequency effects have an on-going effect on the internal complexity of a schema. The frequency of instances of a schema can lead to their entrenching away from the sanctioning schema overall, potentially taking on properties not associated with the more general schema—as Bybee (2001, p. 125) notes, the “frequency of a form weakens associations with other forms.” A particular linguistic form can, by virtue of its high token frequency, become entrenched in its own right, losing connections to other forms sanctioned by a particular schema and acquiring a degree of autonomy (Bybee 1995, Hay & Baayen 2002).

Autonomy goes hand-in-hand with the reassignment of constituent structure that accompanies high-frequency items. Repetition conditions chunking: elements that consistently co-occur develop, over time, constituent structure (Haiman 1994) such that the reoccurring string becomes a unit of use and storage. In a network model, schemata form over connections (semantic, phonetic and syntactic) between utterances, on the basis of shared or similar elements. As a form develops constituency due to the effect of chunking, internal elements contribute less to the overall meaning of the expression, and become less salient. As items internal to a frequent collocation come to participate less and less in the overall meaning of an expression (accompanied, in many cases, by phonological reduction), high-frequency connections lose the basis upon which connections to similar forms are made (Bybee & Scheibman 1999, Beckner & Bybee 2009). Con-
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connections to other instances of the schema fade, a direct processing route forms, and the form may take on properties not consistent with the schema in which it once participated (or once participated in to a greater extent). Bybee & Scheibman (1999) note the effect with the high-frequency collocation be supposed to, which has taken on a function and meaning increasingly distinct from other forms containing supposed.

We see the effect in examples 7) through 9) above. Even within the tendency for PEOPLE ARE ANIMALS to profile negative aspects of animals (and therefore of people), the interpretation for each example is unpredictable. In each case, the frequency of the specific form (dog and fox) as used in reference to a particular target has caused the form’s connection to other, related forms to weaken, and its particular representation to become strengthened, such that the interpretation for the form in question is largely idiosyncratic.

It makes little difference whether these examples are described as lexical metaphors or formulaic metaphors. All three examples look, on the surface, like textbook lexical metaphors, with a single word carrying a set figurative meaning. The contrast between men are dogs and she’s a dog, on the other hand, suggests that both are more akin to the surgeon is a butcher, with a set interpretation arising out of the application of a particular source domain term to a particular target term. All cases are analyzed as particular forms taking on a degree of autonomy from the sanctioning conceptual schema, which, EMT predicts, increases the likelihood of idiosyncracy of meaning.

3.2 Lexical Strength
Svanlund (2007) asserts that lexical metaphors vary in their ‘strength’: their ability to evoke concepts from the source domain. While a metaphor’s strength is not the same as its degree of conventionalization, a metaphor’s strength is itself a conventionalized property, attached to individual words at the lexical level. Svanlund notes that the strength of lexical metaphors is not wholly dependent on the strength of overall cross-domain mappings. The conventional figurative meanings of lexical metaphors, Svanlund asserts, tend to be associated more with individual words than with the underlying Conceptual Metaphors. EMT is well-equipped to handle such differences between lexical metaphors.
Metaphor is conventionalized at the level of broad cross-domain mappings, in the form of schemata that emerge over similar utterances. Individual words, however, can, by virtue of the frequency with which they are used to refer to given targets, entrench away from schemata in which they participate. As a result, the conventionalized metaphorical meaning of an individual word increases inversely to its connection with the schema overall, such that when a given word has a fixed figurative meaning it may or may not be predictable based on the cross-domain mapping overall.

Over time, as a word is used with a specific figurative meaning (or meanings), and the particular figurative meaning of the word gains in strength relative to the metaphor that licenses the overall mapping, the particular mapping evoked by the word takes on a degree of autonomy from the sanctioning schema. At this point, the figurative interpretation for a word can become highly idiosyncratic, and difficult to predict based on the sanctioning schema. On the other hand, however, even extremely entrenched figurative meanings for individual words can remain highly consistent with schematic metaphorical mappings in which they participate. Sweetser (1990), for example, points out an overall pattern in semantic shift for words with a base meaning rooted in sight and vision, motivated by a metaphor whereby understanding a thing is conceptualized as being able to see it clearly (corresponding, in CMT, to IDEAS ARE PERCEPTIONS):

- point of view, crystal clear, illuminate, transparent, opaque, muddy, clear-sighted, bright, brilliant: all have highly entrenched figurative meanings motivated by the above conceptual metaphor. In the case of each of these, entrenchment doesn’t seem to have led the particular aspect of the mapping instantiated by the word too far astray for the metaphorical mapping overall. On the other hand, the high degree of entrenchment for the repre-

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The issue invites the question of whether, for some highly entrenched figurative meanings for words and constructions, there is any connection whatsoever to the broader metaphorical schema that originally motivated the figurative meaning of the word. The question of whether autonomy can be absolute (even to the point that metaphorical motivations can’t be reconstructed), and if so at what point this can be said to occur, is an important one, and a major direction for future research. The finding that metaphorical autonomy can indeed be complete would mirror findings at other levels of linguistic structure.
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sentations whereby these words are equated to set metaphorical meanings is itself indicated by the fact that these are ‘go-to’ words for evoking the overall mapping: while other words and phrases from the source domain (e.g., ‘shine a light on’ or ‘invisible’) are likely to be interpreted, based on the strength of the overall schema, in a way consistent with the IDEAS ARE PERCEPTIONS mapping, the frequency with which terms like *illuminate* are selected leads to their being entrenched as the default terminology for evoking sight to describe thought. In general, this tendency for metaphor to depend heavily on certain source domain terms, while passing over others, has not been well accounted for in previous metaphor research, and is well handled within a frequency-based approach.4

3.3 The Career of Metaphor

The Career of Metaphor Hypothesis (Bowdle & Gentner 2005) asserts that when speakers are exposed to novel metaphorical utterances, they process them as comparisons: the listener draws analogical connections between the source and target domain, drawing inferences based on a comparison of the structure of the source to the target, and interprets the source term in the context of the target by mapping the relevant structure from the source onto the target. As the metaphorical use of a word becomes conventionalized, however, processing shifts away from comparison, and towards categorization. The concept that is drawn from the base is generalized to form a new category, based on traits common to both the literal and figurative meanings of the term. At this stage, the term in question has taken on a set figurative

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4 Such unevenness is a well-known (and often vexing) feature of metaphor for anyone who has done corpus research on metaphorical mappings. For example, I hand-coded the first thousand tokens of lemmas of each of the words ‘track’, ‘fast’, ‘NASCAR’, and ‘car’ from the Corpus of Contemporary American English (Davies 2008). These terms had been established by an experiment on the model of early prototype theory studies (Rosch 1973) as basic for the domain of racing, and were being used as search terms to assess the corpus frequency of COMPETITION IS RACING. ‘Track’ yielded ten uses consistent with the target metaphor, all of the other yielded none. For HOPE IS LIGHT I used ‘sun’, bright’, ‘lamp’ and ‘dark’. ‘Bright’ yielded 6 tokens, ‘dark’ yielded 1, and both of the others yielded none. This type of inconsistency with respect to preferred source terminology is highly typical.
meaning, at the core of the newly constructed category.

Thus, an utterance of men are dogs would prompt, for a listener who had never been previously exposed to it, an attempt to use analogical reasoning to map the relevant feature of dogs onto men. A listener who had a sufficiently high amount of previous exposure to the metaphor, however, would have constructed a category over the subordinate categories MEN and DOGS, characterized by an abstract structure common to both (OPPORTUNISTS?). This figurative meaning of dog is the prototype of the abstract category.

Bowdle & Genter (2005) test this hypothesis in the context of the assumption that the grammatical form of similes (x is like y) and metaphors (x is y) is intimately connected with how each is processed: similes, which look like literal comparison statements, bias processing towards a comparison of attributes, metaphors towards categorization. The first of two experiments they conduct demonstrates that, for sentences containing figurative uses of a word, participants tend to prefer phrasing the sentence as a simile when the figurative use is novel, and as a metaphor when the figurative is conventional. The second indicates that novel figurative uses of a word are processed more rapidly in simile form, conventional uses in metaphor form.

The predictions made by the Career of Metaphor Hypothesis, with respect to processing for novel and conventional figurative uses of a word, align precisely with those of EMT, and the two theories are wholly consistent with one another. Conventionalization is here aligned with repeated exposure to—which is to say, the frequency of—the form being used with a given metaphorical meaning. A listener exposed to a novel figurative use of a word will align (based on the target being referenced and the source being drawn upon) the use of the word with the most appropriate metaphorical schema, based on semantic proximity to relevant schemata. The word is then interpreted within the context of the cross-domain mapping licensed by the schema selected, with multiple competing interpretations at hand. A speaker exposed to, for example, a comparison of a woman to an otter would find PEOPLE ARE ANIMALS the most proximate schema, but within the schema would still be faced with any number of possible interpretations (She’s clever? She’s a strong swimmer? She has a sleek coat?).

For a conventionalized usage, however, the listener doesn’t need to refer
to the overall mapping to interpret the word, as a figurative meaning is entrenched for the word itself. The overall schema is activated, and interpretation of the word or may not be wholly consistent with the schema overall. The word can be reanalyzed on the basis of the schema if context suggests that such is necessary. But the most rapid route to processing is via the representation for the figurative meaning attached to the word itself. Exposed to *she's a fox*, interpretation according to the conventionalized figurative interpretation involving physical attractiveness is the default. Context, however, can prompt reanalysis based on PEOPLE ARE ANIMALS (e.g., *I can't believe she cheated me like that- she's a fox*).

### 3.4 Idiomaticity

At the same time that categorizations form based on semantic similarities, they also form over syntactic, form-based ones. Examples 7, 8, 9, 10, and 12 (above, §3.0) form a set of utterances of the form [noun] is [noun]. 11 and 13 form a set of utterances of the form [noun] is like [noun]. 3, 4, 6, and 13 form a set of utterances of the form [N] [transitive V] [det] [N]. Schemata arising over such categories are fundamentally objects of syntactic representation: they specify a template for a construction in the form of positions that are filled with a set word, or a member of a set class of words. Syntactic schemata (Barlow & Kemmer 1994, Goldberg 1995, 2006, Taylor 1998, Croft 2001) also, however, contain semantic and pragmatic information. Constructions bear an overall meaning that puts constituent elements into set semantic roles, and are accompanied by constraints on usage. The schema arising over the first set above and over literal categorization statements has a strong association with conventionalized mappings, the schema over the second set above and literal comparison statements with innovative, novel ones.

Where a specific mapping becomes partially or wholly autonomous, taking on conventionalized properties that are not predictable based on the overall conceptual schema that forms over the mapping, it often does so in the context of a set expression. *Blow the whistle on x*, for example, participates in a broad conceptual schema whereby perceptual saliency is conceptualized in terms of audibility (*that's a loud tie, that outfit screams 'available'*) , but has a specific meaning of revealing a wrongdoer that isn’t wholly
derivable from the broader schema. Alongside the semantic idiosyncracy comes syntactic inflexibility: while limited operations on blow the whistle in terms of tense are allowed, the words must occur in a fixed order with no intervening elements, and there are strict restrictions on the preceding and following word (the alternate form whistle blower is most certainly related to the blow the whistle on \(x\), but is itself another entrenched, relatively inflexible expression). The effect reflects what has been described by Company Company (2006) as the “cancellation of syntax” (p. 97), whereby, due to the role of frequency in shaping syntactic structure, subjective expressions can lose, over time, their normal syntactic capacities (see also Travis 2006).

All of the items in the third category above are participants in a broad schema with the abstract form \([N] \rightarrow [\text{transitive } V] \rightarrow \text{the} \rightarrow [N]\). Jump the gun and blow the whistle, while each representing in itself a fixed construction, also exemplifies a sub-schema that has close associations with idiom: \([V] \rightarrow \text{the (adj)} \rightarrow [N]\) (e.g., spill the beans, hit the ceiling, blow the lid off, etc.).

In a connectionist model, schemata (at least until they become autonomous) operate as activation networks (McClelland & Elman 1984, Carr & Thompson 1996). Any instantiation of a schema, once formed, triggers activation of the schema overall. The intersection of metaphorical and syntactic schema means that a single utterance (such as blow the whistle) can activate both a cross-domain mapping and constructional pattern. Metaphorically motivated idiom is essentially the class of utterances that activates both a narrow, highly autonomous cross-domain mapping and a highly fixed syntactic construction.\(^5\)

### 3.5 Families of Metaphor, Internal Structure of Mappings

A principal feature of Conceptual Metaphor Theory is that conceptual met-\(^5\) The Career of Metaphor Hypothesis draws a distinction between the co-occurrence of the words in a series, which can lead to their emergence as a fixed idiomatic unit, and semantic similarity among metaphorical utterances, which can lead to a schematization of a metaphor. The two accounts are broadly consistent with one another, although EMT focuses more on the role of syntactic schemata in idiom. The relationship between syntactic and semantic schemata will be explored more fully in future work.
aphors form families of related metaphors, with the structure of a source domain providing a coherent way of conceptualizing the target domain. A cross-domain mapping sanctions the use of concepts and terminology from one domain to describe parallel, if more abstract, ideas in the target. Critically, such mappings are uneven in how they draw on the source: in practice, linguistic metaphors don’t generally sample terminology and concepts evenly from the domain, but rather draw repeatedly on particular items.

One reason for this is the entrenchment of set metaphorical meanings in particular words and phrases. The repeated use of a word or construction to evoke a particular aspect of a source domain causes the form in question to take on a degree of autonomy from the sanctioning schema, in the sense that the entrenchment of the form itself is accompanied by a concomitant weakening of the form’s connection to the metaphorical schema governing the mapping. The entrenched form takes on a relatively fixed figurative interpretation. The stronger the representation for the entrenched form, the more accessible it becomes, and the likelier a speaker is to choose it when selecting a vehicle term from the source domain. We see the end result in a word like *illuminate*, upon which frequency effects have operated to create a default term for evoking the source domain SEEING in reference to KNOWING. We can contrast *illuminate* with *brighten*, which has a roughly equivalent literal meaning, but doesn’t carry the same automatic metaphorical meaning of ‘cause to understand.’

*Illuminate* participates in the schema KNOWING IS SEEING, but has a highly fixed and idiosyncratic interpretation within that schema (hypothesized here to be a function of the high token frequency of its use in reference to perceptions). While the schema is activated when the word is used figuratively, speakers don’t need to use the overall schema to reconstruct anew its metaphorical meaning every time that the word is used or uttered in a figurative sense: the word invokes a direct connection between a particular concept within the source (increasing lighting making something more visible) and a particular concept within

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6 The reader can contrast the acceptability and ambiguity of the following (wholly contrived) pairs of sentences: “She illuminated the topic for me” vs. “She brightened the topic for me”; “His arguments were illuminating” vs. “His arguments were brightening”.
the target (making an idea more easy to understand). While a metaphorical use of *brighten* should evoke the same source domain (SEEING), and even the same concept within the source domain (increasing lighting), the word does not have an entrenched metaphorical meaning, and therefore, for a listener, its metaphorical meaning must be interpreted based on the schema. The example here pertains to individual words, but the same effect applies to longer units—the effect noted for *illuminate* happens also, for example, with *shed light on* $x$. EMT predicts that if it is indeed the case that *illuminate* and *shed light on* are preferred over *brighten* as terms for the source domain SEEING (as would be indicated, for example, by a figurative sentence-completion task in which participants were shown to use them preferentially in referring to increased knowledge), then it should also be the case that *brighten* activates the KNOWING IS SEEING schema more than the other two terms have developed a degree of autonomy from the schema due to their higher frequency as tokens of the schema.

Not only isolated words and constructions are given preferential treatment within a schema. Within the overall cross-domain mapping, some aspects of the source and target domain are consistently invoked, while others go unexplored. The issue of unexplored aspects of a mapping, described by Grady (1997: 270) as “the poverty of the mapping,” is one that has proven difficult within metaphor theory. If there is a cross-domain mapping whereby IDEAS ARE FOOD, such than an idea can be half-baked, conjectures ruminated upon, and information digested, then why are ‘my ideas are completely boiled’ and ‘the information tasted terrible’ strange? If STRONG EMOTIONS ARE MADNESS (such that one can be ‘mad with hate’ or ‘out of one’s mind with grief’), then why aren’t interventions for insanity used to refer to the calming of emotions? CMT puts forward the Invariance Hypothesis, which restricts metaphor from transferring aspects of a source domain’s structure that are inconsistent or incompatible with that of the target domain, as a reason for such unevenness (Lakoff 1990, 2000).

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7 Grady’s resolution to these issues—that such cases are best analyzed as instances of complex metaphors representing the convergence of multiple more basic ones—is actually quite consistent with EMT’s handling of such cases (see §3.5) as sub-schemata of more general schemata.
1993). Alice Deignan (2005: 216), in a series of corpus studies of metaphor, responds to this with two of many possible examples similar to those cited above:

Corpus studies are consistent with Lakoff’s observation about the limited nature of metaphorical mappings, but some of the limitations on linguistic metaphors that were found in the corpus do not seem to be explainable by the Invariance Hypothesis. For instance … blossom tends to be used to talk about relationships, especially romantic ones, careers, and businesses, while flower tends to be used to talk about creative projects. There is nothing obvious in the target domain that would prevent blossom being used about creative projects or flower being used about businesses, yet this happens rarely if at all. Similarly, the mapping … AN ELECTION IS A HORSE RACE is inconsistent in the way it maps; some expressions, such as neck-and-neck apply almost exclusively to politics, but others, such as against the odds apply to personal rather than public competition.

The type of unevenness noted in all of the above examples is a natural outcome of metaphors emerging over tokens of use. Metaphorical mappings don’t pre-exist utterances; they’re not static structures that allow or disallow utterances. It’s true that such a schema, once formed, can be used to interpret and coin novel metaphors—interpretation will be more rapid, and coinages more frequent, in proportion to the strength of the schema, which is a function of its type frequency. The schema, however, does not as a rule pre-exist metaphorical utterances, it forms as an abstraction over them. Novel metaphor can explore new aspects of a mapping, but by its nature, a schema forms over entrenched forms and conventionalized schemata, which will invariably ‘outcompete’ non-entrenched forms as speakers cast about for words and constructions of which to make metaphorical use.

CMT treats special cases of a metaphor as entailments: language users, having applied the systematicity of one domain to another, make logical inferences about the target based on the source (for example, that if IDEAS ARE PERCEPTIONS, then to increase perception must be to increase a person’s understanding). The usage based-model, on the other hand, takes
the ‘bottom-up’ view that while the idea of entailment may apply in some cases of novel metaphor, ‘special cases’ are in most cases more appropriately treated as schemata in themselves. More general schemata form over the tokens comprising the special case, as well as other tokens instantiating...
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3.6 Metaphor as a Continuous Variable

Deignan (1999: 107) notes that “Some metaphors are more metaphorical than others.” Even within specific categories of metaphor, utterances can be placed along a continuum that ranges from literal to metaphorical. Shank (2007), in a study analyzing semantic extension on tactile verbs with figurative meanings relating to perception, isolates all tokens of the four verbs
touch, handle, hold, and feel from a corpus of spoken English, placing them along a continuum from literal uses, referring to physical manipulation, to more abstract and figurative uses, referring to intellectual understanding. Sanford (2008b) reports a study in which one group of subjects was given the task of rating a series of idioms on a scale from 1 to 5 relating to how metaphorical they perceived the idiom to be. A second group of subjects had their spoken performance of the same idioms monitored, and the length of the main verb in each idiom (e.g., spill in spill the beans, and also in the control utterance spill the peas) monitored. The correlation between the two sets of results, following a control for the reduction effect from the frequency of the phrases themselves, indicates a verification of the hypothesis that an idiom’s degree of metaphoricity directly effects the phonological reduction of internal elements. It also, implicitly, validates the gradedness of metaphor for idioms, as corroborated by both methods of measuring metaphoricity. A host of other studies on idiom (Nunberg 1978, Cacciari & Glucksberg 1995, Bosman 1999) have placed idioms along a continuum relating to their degree of novelty, and analyzability—both highly related to the extent to which they activate underlying cross-domain mappings.

The gradedness of metaphor is not a feature well handled by most theories of metaphor: whatever the proposed cognitive underpinnings of metaphor are—cross-domain mapping, integration network, statement of categorization—the process either does or does not take place. Here, a form’s degree of metaphoricity is taken as a function of its degree of autonomy from its sanctioning schema. Lexical metaphors, formulaic metaphors, metaphorically predicated idioms, and other metaphorical utterances at any level of conventionalization: in each of these cases, an utterance is metaphorical to the extent that it activates an underlying mapping. Such activation depends on the strength of the form’s connection to the metaphorical schema governing the mapping, and the strength of the form’s connection to the schema varies alongside its degree of autonomy. The more frequent a form, the weaker its connection to the sanctioning schema, and the less it activates the underlying schema.

3.7 Metaphor Processing and Age
Within a language user’s mind, schemata form over tokens of use, and gain
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 strength in proportion to the number of exemplars. Within a given speech community, speakers have been exposed to the frequencies of metaphorical tokens of use at similar levels, and accordingly have roughly congruent schematic structures. The correlate, of course, is that the less time that a speaker has had to be exposed to metaphorical tokens of use, the less their cross-domain mappings will correspond to those of a language user who has had more time to accumulate exemplars. For a language user whose experience with language was sufficiently brief, few enough exemplars would have been encountered, for many clouds of tokens, to allow the formation of schemata. And language experience is most brief, naturally, for those who joined the community of language users most recently: children.

Metaphor comprehension in children has been a fairly well-documented area, numerous studies confirming the early emergence of metaphorical understanding in children, but also a strong correspondence between age and the ability to comprehend metaphor. Billow (1975) asserts that the comprehension of metaphor is fully developed by the age of 13, emerging alongside higher cognitive structures and the systems of classification necessary to understanding analogical relationships between categories. Nippold and Sullivan (1987) suggest that the capacity for understanding metaphor is tied directly to the emergence of analogical reasoning, the ability both to solve proportional analogy problems and to comprehend proportional metaphors emerging as early as age 5 and progressing parallel to one another thereafter. Broderick (1990) notes that while there is undeniably an improvement in metaphoric comprehension between early childhood and adulthood, these are “related to general improvements in overall comprehension ability rather than to the emergence of specific metaphoric capacities such as relating psychological and physical domains” (p. 65).

Vosniadou et al. (1984) note that children’s difficulties in comprehending metaphors arise in response to a lack of predictability (in relation to linguistic context) of the metaphor, as well as overall difficulty of the metaphor itself, and that older children are better able to cope with a lack of predictability than are preschoolers. Siltanen (1989) notes that the more difficult a metaphor, the more comprehension depends on context: while older children depend less on context than younger children, difficult metaphors are better understood at all ages when a greater amount of context (in this case,
a longer story) is provided. A child who hadn’t been previously exposed to a metaphor needed more context to figure it out. Waggoner and Palermo (1989), similarly, call attention both to the importance of context to children’s understanding of metaphors, noting that while competence at comprehension of psychological metaphors increased with age at least as far as the college level, above-chance levels of performance were observed in the youngest of the study’s participants (5 years old). Seitz (1997) points to the emergence, by the age of 6, of the use of linguistic knowledge to apply already present metaphorical capacity (seen in younger children mostly through visual perception of metaphorical relations) to psychological concepts.

Evans and Gamble (1988) found that most errors in metaphor comprehension were tied to attribute saliency: where children fail to explain a metaphor in a way similar to how an adult would, it is often because they single out different aspects of what is important about concepts. The authors assert that “what comes readily to mind for young children regarding certain words is quite different than for older children and adults. For example while older children and adults listed ‘fight in wars’ and ‘carries weapons’ as important characteristics of soldiers, young children mentioned ‘marches’, ‘wears a black and red uniform’ and ‘stands straight’” (p. 435). Whereas an adult might interpret a metaphor involving a soldier as highlighting the soldier as one who fights, a child might tend to focus on the physical attributes of a soldier.

Metaphorical ability, in short, emerges early on, but children don’t generally interpret metaphors in the same way that adults do until considerably later. What’s notable, in the case of errors, is that children do interpret metaphors, they just don’t necessarily do so in the same way that adults from the same speech community do. Whereas such findings are explained in much of the research cited above in terms of the development of various cognitive capacities that precede various types and levels of complexity of metaphor use, it would seem just as reasonable to explain such errors in terms of a lack of exposure to the metaphorical systems motivating the target interpretations. If metaphorical systems develop, within a language user, as abstractions over stored tokens of use, then it’s wholly expected that while young children might have the capacity for cross-domain mappings, they
wouldn’t have accrued sufficient language experience to have developed the specific schemata to facilitate the mappings that allow an adult speaker to use and interpret a given metaphor in roughly the same way as other speakers within the community. Children enter the metaphorical world inhabited by adults slowly, as they form, through exposure to individual metaphorical forms that comprise tokens of use, schemata governing the cross-domain mappings that comprise a culture’s shared system of metaphors.

4. Conclusion

My proposal is that metaphorical systems do not underlie and license metaphorical tokens of use. Rather, they emerge over them in the form of schemata that link cognitive domains. Many essential features of metaphorical systems, especially as they pertain to conventionalization, have been noted elsewhere, but not followed to the conclusion that metaphorical systems are emergent in nature, arising over the fact of language in use. Such features of metaphor follow naturally from this conceptualization of metaphor.

Even for highly productive metaphors, a large proportion of instantiating tokens are accounted for by a handful of highly entrenched forms. This phenomenon, as well as the existence of subcases/inferences for overall mappings, speaks to the way in which schemata form over actual tokens of use: metaphors aren’t entities that govern an evenly distributed range of possibilities, some of which are mysteriously absent from language in use. Metaphors are abstractions formed over uneven input. Such mappings correspond to conceptual metaphors, and entrenched forms to lexical, formulaic, and idiomatic metaphors.

Idiosyncratic, conventionalized meanings for lexical, formulaic, and idiomatic metaphors are a result of the autonomy of forms with a high degree of entrenchment relative to an overall schema, resulting in a weakening of the connection between the entrenched form, and other forms sanctioned by the schema. A metaphorical form’s degree of autonomy corresponds inversely to the extent to which it will be perceived as metaphorical by the speakers of a language.

The metaphorical systems that are shared across individuals within a culture are a result of shared membership within a speech community, and
roughly approximate levels of exposure to metaphorical tokens of use over which emerge conceptual schema that govern cross-domain mappings. The ability to use and process metaphor according to cultural norms for adult speakers results from children not having been exposed to sufficient tokens of use for many metaphors to be firmly entrenched.

I do not argue that frequency is the only cause for the linguistic and conceptual structure of metaphor: there are many features of metaphor that a usage-based approach does not account for. While the strength of a schema, and of metaphorical forms within it, are important aspects of why a speaker casting about for a metaphor settles on one mapping or form over another, there are other important factors as well. One of the core claims of CMT, that metaphor is a tool whereby the abstract is conceptualized in terms of the concrete, is foremost among these. Sanford 2008a combined a corpus-based study in which all instances of metaphor were isolated from a corpus of approximately 40,000 words and coded as to their target domain, with a survey instrument in which participants were asked to rate the concreteness of each of the categories used for coding the target domains in the corpus. The study found a significant negative correlation between concreteness and the frequency of a given category being referred to metaphorically, indicating that the concreteness of a referent is a clear factor in speakers’ deciding whether or not to refer to it metaphorically. The more concrete a referent is, the less likely it is to be referred to metaphorically. Furthermore, the concreteness of the source relative to the target is a clear factor in choosing a source domain, such that targets are almost invariably less concrete than sources. This constraint is not accounted for by a usage-based theory, but neither is it outside of its purview: it feeds, and is in turn reinforced by frequency effects, such that a mapping or form that projects a concrete domain onto an abstract one will be more rapidly conventionalized.

This is one of many possible examples of aspects of metaphor that are not accounted for within a usage-based account of metaphor, and it raises the broader issue of the relationship between EMT and other theories of metaphor. EMT accounts extremely well for certain aspects of metaphor, some of which have also been addressed in CMT and elsewhere (e.g., the entrenchment of metaphorical meaning, the idiosyncracy of the metaphorical meanings of certain words and constructions, the emergence of meta-
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phor in children, and the non-binary nature of metaphoricity). Many other aspects of metaphor, those which are gathered here under the general realm of ‘aptness’, are not strictly addressed. Another clear (and highly related) example of such a factor is the tendency towards metaphorical embodiment, Lakoff & Johnson’s (1980) observation that basic metaphors often draw on the direct physical experience of inhabiting a body. At the surface level, and especially in novel forms within certain genres, cleverness (for example, the incorporation of other forms of figuration) is highly valued. Such aptness constraints play a predominant role early in a metaphor’s lifespan. They are the criteria applied to novel metaphors (alongside, of course, the metaphor’s acceptability as influenced by its proximity to existing metaphorical schemata), and in many cases follow from the analogical nature of new metaphors (e.g., the unidirectionality of metaphors). It is an explicit goal for EMT to provide an account of the relative importance of metaphorical type frequency, metaphorical token frequency, and the host of factors falling under the label of aptness in accounting for increases and decreases in the corpus frequencies of metaphorical utterances over time. Factors pertaining to aptness may not be quantifiable; frequency is. It is a plausible goal for the research enterprise laid out by EMT to show how much predictive value prior frequency has in showing the future frequency of a given metaphor or metaphorical utterance. Within a multivariate analysis, prior frequency is predicted to have a larger effect than any other variable in predicting future frequency. For many aspects of metaphor, however (in particular, those pertaining to cross-linguistic tendencies in preferred source domains and preferred source-target mappings) aptness constraints account best for observed patterns.

I’ve presented the argument here that exemplar theory is the best model for handling the bearing of frequency effects on metaphor, and that such effects are the best explanation of many features of metaphor. There is an

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8 Veale (1996) is the first author of whom I’m aware to use the term ‘aptness’ in this sense, pertaining to a variety of factors that bear on the ‘quality’ of a metaphor in the same sense that other factors pertaining to humor bear on the funniness of a joke. The source also provides an excellent run-through of factors bearing on aptness.
immense amount of work to be done, across all exemplar-based approaches but in particular in semantic applications, in working out the parameters whereby categorizations take place. Smith (2005) points out a continuum between narrow, specific representations and broad/collective ones, noting that the scope of generalization for exemplar representations is both critical, and, theoretically, measurable. For the application to metaphor, the critical research questions are: 1) as speakers are drawing connections between utterances, what degree of proximity is necessary for a connection to form, 2) what are the criteria for measuring this proximity, and 3) what is the relative importance of source and target domains in establishing connections between metaphorical utterances?

Answers to these questions aside, Emergent Metaphor Theory makes a number of concrete predictions relating to the storage and processing of metaphor. The literature on frequency effects in language (Bybee 1985, Moder 1992, Pierrehumbert 1994, Dabrowska & Szczerbinski 2006, Wang & Derwing 1994) speaks to three main effects from frequency (see §1.1.4). Accompanying an increase in token frequency (i.e., an increase in the tokens of use to which to the typical speaker of a language is exposed), there is an increase in:

1) Accessibility. The more frequent a schema, the more rapidly it is accessed.
2) Acceptability. Speakers make decisions as to the acceptability of utterances based on the frequency of the utterance and/or its similarity to frequent utterances.
3) Productivity. High type frequency (in combination with the openness of the schema) determines the likelihood that the schema will be applied to new items.

The validity of EMT as an explanatory model rests on the demonstration of these effects, well-attested at other levels of linguistic structure, for metaphor at the level of cross-domain mappings. This would be demonstrated by experiments showing a demonstrable difference, for each of the above three items, between processing of metaphorical utterances instantiating metaphorical schemata of higher vs. lower frequency.
Conceptual Metaphor Theory made the key insight, reflected in both further iterations of CMT and in subsequent cognitive theories of metaphor, that metaphor is a conceptual, rather than a strictly linguistic, system. In individuals and on a cultural level, the systematicity of one domain of thought is used to structure another. This is a domain-general cognitive phenomenon, instantiated in, but not limited to, language. The usage-based approach to metaphor put forward here preserves this view of metaphor, but takes a more dynamic view of the conceptual system that is the essence of metaphor: in that metaphorical schemata are created and strengthened as metaphorical utterances are processed, linguistic metaphor—the facts, as they pertain to figuration, of language in use—has direct input into the conceptual system that motivates language. If it can be said that linguistic metaphor is predicated on a more general conceptual system, it can as easily be said that it is the conceptual system that is motivated and shaped by language. Neither statement is entirely true. The cognitive structures that are metaphor emerge over instances of linguistic metaphor in use, which are in turn produced, judged, and processed on the basis of the emergent cognitive structure of metaphor.

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