Primary metaphors as inputs to conceptual integration

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Abstract

One of the most striking aspects of conceptual integration (or ‘blending’) is that it seeks to unify an extremely broad variety of conceptual phenomena – from the most startling feats of imagination and invention to the most mundane instances of conceptual composition – and treats them all as the products of a single cognitive process (or closely related suite of processes). This article focuses on metaphoric blends, and assesses properties that distinguish them from other blends, and lend them their particular quality. In particular, the paper examines the nature of metaphoric counterpart connections, and especially the “ready-made” connections, i.e., entrenched metaphoric correspondences between concepts, that provide the basis for the real-time construction of metaphoric blends. The paper argues that primary metaphors constitute a distinctive class of counterpart connections and they require an explanation not found among blending theory’s other technical apparatus. These patterns of metaphoric association cannot be explained by mechanisms such as analogy, nor by relations such as cause-effect or identity, which underlie other sorts of blends. Instead they derive from recurring correlations between particular types of mental experiences.

Keywords: Metaphor; Counterpart connections; Experiential basis; Metonymy

1. Introduction

Much of the current work on conceptual blending (i.e., scholarship within the framework developed by Gilles Fauconnier and Mark Turner, and most fully expressed in

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these authors’ *The Way We Think*, 2002—henceforth *TWWT*) aims at enriching the theory by incorporating greater degrees of structure and context. This article, on the other hand, focuses on one very narrow, though indispensable, piece within the complex conceptual associations that constitute ‘integration networks’. In order for a metaphoric conceptualization to arise (for example, the notion that a happy facial expression is “bright” or “sunny”) there must be a correspondence between elements in two distinct conceptual representations (such as mental images of a face and a sunny day, respectively). This paper examines the nature of these connections, which blending theory calls ‘counterpart connections’, and explores what they tell us about the cognitive work performed by blends, and work that must happen “before” a blend can be born.

While the blending theory literature touches regularly on metaphoric blends, there has been relatively little focus on the special properties of metaphors as opposed to other products of conceptual integration. In fact, some of the key initial insights of blending theory concerned commonalities between metaphor and other types of figurative conceptualization, and distinctive features of metaphor have been backgrounded in most subsequent research. Grady et al. (1999) addressed the relationship between metaphor theory and blending theory, including the topic of metaphors as a unique type of blend, and suggested that the two theories are complementary in several respects. One of these, pursued in greater depth here, is the idea that conventionalized metaphoric patterns may provide “ready-made” counterpart connections for the real-time construction of blends — many metaphors are patterns stored in long-term memory, whereas blending is conceived as an “opportunistic”, “online” process, which allows us to combine conceptual material with astonishing speed, fluency and freedom.

Blending theory does acknowledge metaphors as a particular kind of conceptualization, and refers explicitly to “metaphoric counterpart connections” (e.g., *TWWT*: 47). To date, however, the theory has not taken a clear stand on the nature of these connections — whether there is a stored set of such connections, for example, or, alternatively, whether metaphoric connection might be a relation more like Part-Whole or Cause-Effect, simply a fact about the logical relationship between two given entities. The theory has also not been clear on the question of what makes metaphoric counterpart connections different from other types, if indeed they really constitute a distinct sort — various statements in the literature have suggested that metaphors are not a special case, but “fall out” from such general principles as Compression (see below) and Analogy. This article seeks to clarify the role played by entrenched metaphorical patterns within the larger phenomenon of conceptual blending, and to show that there is a unique type of conceptual association at work in many metaphors. More specifically, the paper makes a case that primary metaphors do constitute a distinctive class of counterpart connection that requires explanations not found among blending theory’s other technical apparatus.

### 2. Analogy as the basis for metaphorical blends

Along with many other theories, blending theory usually treats metaphors as analogical mappings (e.g., *TWWT*: 329–330; Coulson, 2000). That is, the association between the two
concepts is often said to reflect shared features which align the two. In this section we take a closer look at this view, and its implications about the nature of the counterpart connections that link ‘mental spaces.’

2.1. ‘Free’ analogy

In order to understand what happens when we conceive of something in metaphorical terms – when we first think of cheeks as ‘red cherries’, for example – we need to consider how the metaphorical concept (i.e., the ‘source’, in this case cherries) is evoked. Presumably we are first thinking of the cheeks (the literal concept we are initially concerned with, also called the ‘target’). In everyday terms, the red cheeks presumably ‘remind us’ of the image of cherries. We can use the terminology of conceptual blending theory to describe in somewhat more detail what “remind” might mean here, and the nature of the link between the two concepts.

Within the blending framework, the objects of thought at a given moment, such as a mental image of a particular face, are understood as the contents of ‘mental spaces’ — active mental representations consisting of self-contained ‘packets’ of information (see Fauconnier, 1994 for an introduction to mental space theory, a forerunner of blending theory). The figurative conception of cheeks as cherries, then, must begin with an initial stage in which only a single mental space is active, the target space containing a representation of the face. The image of a small, round, red shape, inhering within the face space, can evoke other representations containing those same elements, in this case a source space containing the cherries. The cognitive link between the relevant color and shape elements in each space constitutes the counterpart connection(s) between cheeks and cherries which blending theory requires in order for the spaces to be combined, yielding a blended conceptualization of cheeks-as-cherries.

This simple story is a reasonable first approximation of how source spaces might sometimes come to be activated. A target space containing the idea of an agitated baby who may begin to scream loudly at any moment, for example, might remind us of a time-bomb which could produce a loud explosion at any moment, evoking a time-bomb space as the source space, and leading to a metaphoric conceptualization of a fussing baby as a ticking time-bomb. To summarize, one plausible hypothesis about (some) metaphoric counterpart connections is that they consist of associations between distinct mental representations that remind us of one another because they strike us as similar in some way. (Of course this account presumes a field of study devoted to defining the nature of similarity and analogy — i.e., what counts as shared features; see, e.g., Gentner et al., 2001.) Such associations would be freely generated, leading to any number of fresh counterpart connections which we would count as metaphoric.

Many accounts within philosophy and psychology (e.g., Glucksberg and Keysar, 1993; Searle, 1979) imply that all metaphors (or all normal metaphors) follow this pattern and are based on shared features noticed or asserted in the moment. As blending theorists have pointed out, though, metaphoric blending does not need to rely on spontaneous connections between domains. There are various patterns stored in memory which can also serve as counterpart connections for metaphoric blends.
2.2. Drawing on stored connections

While blending theory has been described as a “theory of online meaning construction” (Coulson and Oakley, 2000: 175), and ‘blenders’ have tended to focus attention on the (theoretically) real-time processes which allow a particular conceptualization to arise and to be comprehensible, the theory explicitly acknowledges the role of stored patterns as necessary materials for conceptual integration. For instance, Fauconnier and Turner refer to “an existing template for blending states and locations” (TWWT: 372), and note that in the Baby’s Ascent blend, the target space is “already structured so that living a life is moving along a path in some manner, and good fortune is up and misfortune is down.” (TWWT: 80).

One source of the established patterns pointed out in the literature is the conventionalization of particular integration networks. Once a blend has become conventionalized it may be recruited and serve as an ‘input’ to subsequent blends. The common Ship-of-State trope, for example, is established as both a cognitive and a cultural resource, serving as a template and springboard for various particular conceptualizations which project the vessel onto the nation, the ship’s spatial course onto the nation’s history, and so forth. Likewise, there are numerous idioms in English, and any language, which began their careers as the inventions of individuals, but now constitute established lexical means of expressing metaphorical conceptualizations — e.g., come full circle, one of William Shakespeare’s numerous coinages (King Lear). The metaphorical conceptualizations underlying such idioms are presumably evoked to a greater or lesser degree depending on the speaker and the situation.

We can point to any number of other such conventional patterns at various levels of specificity, and the field of conceptual metaphor theory (i.e., research more or less in the tradition of Lakoff and Johnson’s influential Metaphors We Live By, 1980 — henceforth, MWLB) has focused primarily on discovering these established patterns, identified as “the metaphor system” of English speakers (e.g., Lakoff, 1993). Conceptual metaphor scholars have collected evidence for such common conceptualizations as ‘Life is a Journey’, ‘Anger is the Heat of Fluid in a Container’ (e.g., Lakoff, 1987: 387), and so forth.

If our aim is to get a better grasp of the nature of metaphoric counterpart connections, though, it is not enough to acknowledge that certain cross-domain connections are established in the conceptual repertoire of English speakers. We must also investigate the basis of these patterns which ultimately become conventionalized. Do they all depend on shared features — i.e., analogy? Can we define a metaphoric counterpart connection as an association which is based on shared features and has acted as the basis for a (conventionalized) metaphoric conceptualization? Previous research suggests that this definition would leave out many common metaphorical patterns.

2.3. Patterns not based on analogy

Some conventionalized metaphors certainly are examples of the kind of analogical mapping emphasized in blending theory accounts of metaphor — image metaphors like
neck of a bottle and beanstalk (a.k.a. ‘attributional metaphors’; Gentner, 1988) and possibly also such common patterns as referring to people as the animals with which they supposedly share character traits (e.g., pig, wolf, ape). On the other hand, these established comparisons represent only a subset of cases.

As conceptual metaphor theorists since Lakoff and Johnson (1980) have pointed out, there are many common metaphorical patterns which are not easy to account for in terms of shared features. Many of these turn out to be crosslinguistically common, suggesting that they have a basis in some fundamental aspect of human experience, thought, or language, though this motivation is apparently unrelated to similarity between source and target. The pattern in which (physically) ‘cold’ stands for ‘emotionally unresponsive’, for example, is found in unrelated languages around the world, as these few examples illustrate:

<table>
<thead>
<tr>
<th>Language</th>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin</td>
<td>frigus</td>
<td>‘cold; unfeeling’</td>
</tr>
<tr>
<td>Arabic</td>
<td>buruuda</td>
<td>‘cold; unfeeling’</td>
</tr>
<tr>
<td>Indonesian</td>
<td>dingin</td>
<td>‘cold; unfeeling’</td>
</tr>
<tr>
<td>Chinese</td>
<td>leng</td>
<td>‘cold; unfeeling’</td>
</tr>
<tr>
<td>Old Irish</td>
<td>uär</td>
<td>‘cold; unfeeling’</td>
</tr>
</tbody>
</table>

Can we account for the common association between physical and emotional coldness in terms of analogy — features shared by unemotional people and cold objects? In one sense, unemotional people actually are physically cold. Numerous studies have shown that emotional experiences are associated with particular changes in skin temperature (e.g., Ax, 1953; Ekman et al., 1983); in particular, emotional arousal is associated with a rise in skin temperature. Nonetheless, it does not seem plausible that unsympathetic people are conceived as cold because we touch them and find their skin to be cold; and the studies do not suggest that the skin temperature differences in question are discernible to another’s touch.

Perhaps the commonality is instead that both cold objects and unemotional people make us unhappy or fail to give us pleasure? This is also an unsatisfying explanation, since there are certainly many cold objects, such as ice cream or a splash of cold water on a hot day, which do make us happy. The connection between cold objects and emotional dissatisfaction is certainly nothing like the consistent connection between sugar and pleasure which underlies metaphorical senses of sweet.

Philosopher John Searle may have considered just such possibilities before arriving at the following conclusion about the connection between cold and lack of feeling:

I think the only answer to the question, ‘what is the relation between cold things and unemotional people that would justify the use of ‘cold’ as a metaphor for lack of emotion?’ is simply that as a matter of perceptions, sensibilities, and linguistic practices, people find the notion of coldness associated in their minds with lack of emotion. The notion of being cold just is associated with being unemotional. (Searle, 1979: 267, emphasis added)

But of course there is a plausible explanation for the connection, which we will discuss in the next section.
3. Experiential correlation as a basis for metaphorical blends

The correlation between emotion and skin temperature is real and experienced. We feel warm when our emotions are aroused, and we feel warm when we are close to other people, as we are when we interact intimately. There is a conceptual association between coldness and lack of feeling, not because interacting with a cold object and interacting with an unfeeling person are perceived as similar experiences, but because through recurring experience we associate the conceptual domain of temperature with that of emotion.

*MWLB* pointed to correlation as a basis of conceptual metaphors, and this type of account in terms of recurring correlations between fundamental dimensions of experience is the basis of the theory of ‘primary metaphors’ (see Grady, 1997a, 1997b, 1999; Lakoff and Johnson, 1999). Like Unfeeling-is-Cold, other patterns motivated in this way – e.g., More is Up (e.g., “Bankruptcies have skyrocketed”), ‘Functional is Erect’ (e.g., “The computers are down.”) – are not credibly explained as products of spontaneous, online analogical projection. These patterns tend to be cross-linguistic because they are motivated by correlations which are so fundamental and inescapable that they do not vary from culture to culture — no cultural knowledge is required in order to associate temperature and feeling, or weight and difficulty, etc.

3.1. Causation as the underlying relation?

The argument so far – following *MWLB* and later work on primary metaphors – is that certain very common metaphor patterns are motivated by tight correlations in experience, rather than by features shared between source and target. Other, more specific, relationships have sometimes been proposed in the literature as the bases for these types of connections, however. Fauconnier and Turner (2002: 299), for example, suggest that the metaphorical connection between anger and heat (e.g., “He was burning with rage”) is based on an underlying causal relationship. We feel warm when we are angry; the experience which is the basis of the target concept (anger) causes the experience referred to by the source concept, i.e., heat.

Some other primary metaphors appear to follow this same pattern, target-causes-source. For example, More-is-Up can be plausibly traced to the recurring association in experience between quantity and height (e.g., of a pile). It is certainly fair to say that quantity is a cause of height in these scenarios. (For further discussion of the types of scenarios which motivate primary metaphors, see Grady, 1997a, 1997b and Grady and Johnson, 2000 on ‘primary scenes’.)

But target-causes-source is not a generalization which holds for all primary metaphors. For example, Difficulty as Heaviness (e.g., *a heavy workload*) would seem, if anything, to be a case where the source causes the target; heaviness (source) is a reason for effortful interactions with objects, not a consequence of it. And if a metaphorical association between functionality and erectness (e.g., *The computers are down.*) is thought of as having a causal basis, which way does the causality flow? Is a pole functional because it is standing, or is it standing because it is functional?
As the table above reflects, the directionality question alone would make a causality account problematic as a general characterization of primary metaphors. Other cases are hard to think of in terms of cause and effect at all. For example, there is a consistent metaphorical pattern in which logical/causal organization is conceived as physical part-whole structure:

<table>
<thead>
<tr>
<th>Anger as Heat</th>
<th>(target causes source)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More is Up</td>
<td>(target causes source)</td>
</tr>
<tr>
<td>Difficult is Heavy</td>
<td>(source causes target)</td>
</tr>
<tr>
<td>Functional is Erect</td>
<td>(directionality?)</td>
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There are several pieces to the plan.
The whole project has fallen apart.
The enforcement system has unraveled during the current administration.
Part of his explanation made sense to me, but other parts didn’t.

There is certainly a connection between part-whole structure and causal organization — e.g., we perceive the legs of a table as physical parts and are also aware that they perform a specific sub-function within the overall function of the table (i.e., support). But can we say that the fact that legs are parts causes them to have a functional role? It seems instead that the two facts are simply inseparable counterparts, two sides of the same coin, physical and logical, respectively, but that neither causes the other.

To take another example which does not seem to arise from a causation relationship, consider the metaphorical pattern in which paths stand for means:

There are many routes to achieve a given objective.
She has a circuitous way of getting what she wants.
Wie plans a different path to success [headline about a young golfer, from the Toronto Globe and Mail news web site]

This metaphor reflects a correlation between our experience of physical paths and our experience of goal-oriented activity. (This metaphor is closely related to one in which physical goals stand for objectives.) It is hard to conceive of either the path or the path’s status as means-to-an-end as the cause of the other. We can conclude from these and similar examples that there is no general story in which causation is the relation underlying basic metaphoric patterns, though causation does figure prominently in the scenarios which motivate some of them.

3.2. Instantiation as the underlying relation (Generic is Specific)

Another relation which has been proposed as a basis for metaphorical relations between concepts is one in which the source concept is a more particular instance of the target concept. (See Lakoff and Turner, 1989 on the Generic-is-Specific pattern.) For example, in the proverb “the early bird gets the worm”, the early bird stands for anyone who does something

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1 As one of the reviewers of this article noted, GENERIC IS SPECIFIC should probably not be considered a metaphor per se. Since it does not involve a connection between any particular concepts we can regard it instead as a common and productive pattern of figurative association.
sooner or earlier than others — a straightforward example of specific standing for generic. Some primary metaphors can also be thought of as examples of this relation. For example, there is a very common pattern in which caused-motion stands for causation in general. E.g.,

I was pushed into doing it.
Greed drives innovation.
Boyd had the good sense to . . . recognize that many who voted for the bill were shoved into doing so. [from an editorial on the web site of the News Herald, Panama City, FL]

The status of propulsion as a prototypical kind of causation seems clearly to be the basis for the Causation-as-Caused-Motion pattern, which has features typical of primary metaphors. For instance, the source concept is extremely basic and schematic, and is associated with sensory experience — i.e., propulsion is experienced via vision or kinesthetic, tactile perception. And the target concept, causation, is in the realm of fundamental dimensions of mental experience, but not tied to any particular kind of perceptual schemas (see further discussion of sensory vs. nonsensory concepts below). Furthermore, the pattern is observed in other, unrelated languages — e.g., Russian tolkat’ ‘push, shove; induce, prompt’, Indonesian sorong ‘push; urge’, Arabic zajja ‘push; urge’. Another common metaphorical pattern which falls into the Generic-is-Specific class is Knowing is Seeing, since the source concept is associated with an experience which always entails the experience type underlying the target concept — i.e., ‘seeing’ something, by definition, entails taking in visual information.

Once again, however, we have identified a set of primary metaphors which does not include them all. In many cases of primary metaphor, the source and target are quite independent. More is Up is a good example: quantity and vertical height are distinct dimensions of experience. We often judge quantity in ways that have nothing to do with a vertical dimension — e.g., when we talk about how much stress we have experienced, how much money we have spent lately, how much music we have listened to, etc. Scenarios in which height figures are not a proper subset of scenarios in which quantity figures. Certainly the situations in which we are aware of the height of a stack, or the level of fluid in a container, are a subset of the situations in which we are aware of quantity, but this amounts to saying that height and quantity sometimes co-occur as salient features of a scene, i.e., that there is correlation — an intersection rather than a set–subset relationship (Fig. 1).

To sum up, we have seen that the one generalization which accounts for all primary metaphors is that they can be plausibly traced to correlations (i.e., consistent co-occurrence) in experience — correlations which sometimes, but not always, reflect either a causal relationship or an instantiation relationship between source and target. MWLB’s proposal that correlation is the basis for conceptual metaphors in general has been refined by work on primary metaphors showing that these constitute a special set of patterns directly motivated by correlation, and this analysis offers substance to the notion that blends may be based on counterpart connections which are distinctively metaphoric in nature.

2 Other classes of metaphors, which appear not to be directly motivated by correlations in experience, include complex metaphors which combine primary metaphors (Grady, 1997b), metaphors based on the perception of shared features (as discussed above), personification metaphors, synesthetic metaphors, and possibly others.
4. Correlation, vital relations, and compression

The starting point for this paper was the fact that conceptual integration networks depend upon counterpart connections in order for blending processes to be launched. Two input spaces cannot be linked and integrated unless there is at least one counterpart connection which anchors and guides the combination of their various elements. Primary metaphoric associations stored in memory, which are ultimately based on correlations in experience, provide a means of linking objects in source and target spaces which would otherwise not be mapped onto one another. In this section we explore the reasons why correlation contributes to blending in this indirect manner, rather than by acting directly, in itself, as a type of counterpart connection which could allow blends to arise online.

4.1. Vital relations

Fauconnier and Turner list a number of types of counterpart connections which may link elements in different spaces. These include “connections between frames and roles in frames, connections of identity or transformation or representation, analogical connections, metaphoric connections, and, more generally, ‘vital relations’ mappings” (TWWT: 47). We have already excluded analogical connections as the basis for primary metaphors, and “metaphoric connections” are precisely the phenomena we are trying to understand more clearly — the term itself offers no information about the counterpart connections that could allow primary metaphors to arise. The remainder of the fifteen vital relations enumerated later in Fauconnier and Turner’s discussion (2002: 101) include Part-Whole, Similarity, Cause-Effect and others which are self-evidently crucial to our understanding of the world and our surroundings – but not correlation. Should correlation be added to the list, in order to account for the relationships in experience and conceptual structure which lead to primary metaphors? Before trying to answer this question we should briefly consider the role of vital relations in the creation of blends.

Blending theory emphasizes that one of the most fundamental principles guiding the creation of new, figurative conceptualizations is the ‘compression’ of relations holding across input spaces (i.e., ‘outer space relations’), into simpler configurations in the blend. For example, in the Buddhist Monk blend (Fauconnier and Turner, 2002: 39–44) an outer space connection between an act of walking up a hill on one day and an act of walking down the hill on another day is compressed to Uniqueness in the blend — the temporal relation has been compressed so that both events happen on one and the same day. Given this theoretical machinery, if correlation were a vital relation, and therefore a type of
counterpart connection, it too would presumably be compressed to uniqueness in the formation of a metaphorical blend. On such an account, an increase in prices, for example, would be conceptualized as an instance of “soaring” thanks to a correlation between quantity and height which is compressed to a unique property in the blend (Fig. 2).

4.2. Correlation and cognition

There is certainly ample reason why correlation should be considered a fundamental and significant relationship. Beyond its role as a basis for metaphorical associations between concepts, correlation obviously plays a crucial role in other aspects of cognition, and is in fact one of the most important and basic types of relationships which we (and other species) use to understand the world. It appears that even at the neuronal level, correlation plays a role in the basic mechanisms of learning: when two neurons linked by a synapse fire at the same time, for whatever reason, the synapse changes such that it becomes more likely that the cells will fire together in the future. On the level of human thought, correlation is surely one of the important bases of the experience of mental domains and spaces. Otherwise unrelated elements – e.g., guns and hierarchy within the Military domain, or heat and flavoring within the Cooking domain – are correlated with each other in our experience as well as our conceptual systems, so that they are associated and seem to be parts belonging to a whole.

4.3. Online compression implausible

There are reasons to conclude, though, that metaphoric blends do not arise from correlations that can be noticed in the moment. For example, although there is a regular correlation between height and quantity in our experience, there is no such correlation in most of the situations to which the More-is-Up metaphor may be applied — e.g., height simply isn’t an element of the target space of increasing prices. Rather, the connection between height and quantity is an entrenched and pre-existing one, available for recruitment. When we think about quantity, we may be “reminded” of the notion of
physical elevation — not in the same way that the redness of cheeks reminds us of the similar redness of cherries, but because there is a stored association between the two domains based on recurring correlation in experience; when a cognitive representation of quantity is activated, it is possible or even likely that representations involving height will be activated. Once this stored connection is recruited, it licenses the creation of a blended conceptualization. Other primary metaphor patterns, likewise, are entrenched metaphorical associations based on recurring correlations in experience, rather than spontaneous compressions of a real-time representation of correlation.

In short, metaphoric counterpart connections are motivated by, but are not the same as, correlations in experience.

5. A subset of correlations

Not all correlations in experience lead to entrenched metaphorical associations. In fact, many common types of correlation lead instead to metonymic associations between concepts. For instance, the association in our minds between an object and the creator of that object is reflected in the common metonymic pattern of Producer-for-Product — e.g., “a Renoir”, “She’s been reading a lot of Faulkner”, “I’d never buy a Chrysler”, etc. Researchers have identified many more of these common metonymic patterns arising from regular co-occurrence of two types of element in the same scenario (i.e., frame-internal relations), such as Place-for-Institution (“Washington has announced …”, “Wall Street hasn’t been impressed …”); Means-for-Action (“I booted him the ball …” “She clubbed him …”) and so forth.

Other regular correlations in experience lead to no conventionalized patterns of association, whether metonymic or metaphoric. For instance, we regularly encounter correlations between certain types of shapes or patterns and particular colors. To take one example, we can easily recognize grass in a black and white close-up photograph because of the characteristic pattern of small, blade-shaped objects, close together, emerging parallel from the ground, reaching approximately the same height, and so forth. On a regular basis, the visual experience of this spatial configuration is associated in our minds with the color green. Yet there is no conventional metonymy linking the concepts of green and the shape pattern of grass. (We do not refer to the color when we really mean the characteristic pattern of blades, or vice versa.)

Only correlations of a certain kind lead to metaphoric associations between concepts. These correlations must meet the three conditions discussed below.

5.1. Condition 1: Sensory and nonsensory

One of the concepts, which will end up being the source concept in a metaphoric pairing, refers to a basic dimension of sensory experience, whether visual, tactile, or in any other modality — heaviness, brightness, forward motion, upright position, etc.

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3 As a reviewer pointed out, we do use the word green to refer to certain lawns and parts of a golf course. But these usages, while metonymic, do not necessarily call to mind the blade shape referred to in the discussion.
(This set may in fact be equivalent to a list of image-schemas.) The other, the target concept, is associated with an equally fundamental element of mental experience, but one not primarily associated with a particular sort of sensory impression — effortfulness, happiness, similarity, achievement of a purpose, etc. This distinction between sensory and nonsensory provides the most plausible explanation for why some concepts occur only as sources (e.g., heaviness) and others only as targets (e.g., similarity).

5.2. Condition 2: Shared “superschematic” structure

The two correlated concepts must also be construable as having the same highly schematic structure. For instance, they must both be construable as states (viability-erect posture), as scalar properties (bright-happy), as atemporal relations (inside X-member of category X), or as actions (achieving a purpose-arriving at a destination), as events (failure-collapse; seeing-coming to know), as entities which can serve as landmarks, or as trajectors (state of affairs which is allowed to continue-physically supported object; fact-object which is seen), and so forth. They must also agree with respect to parameters such as boundedness (e.g., a fact and an object which is seen), aspect (e.g., both achieving a purpose and arriving at a destination are punctual events), and ‘arity’ (i.e., they are both relations involving the same number of participants). Given these constraints, it is clear that Difficulty and Heaviness are eligible for metaphoric pairing — they are both scalar properties — while Difficulty and “The Act of Supporting a Heavy Object” are not.

This constraint contrasts with the “Invariance Principle”, formulated as follows, for example, by Turner (1991: 72):

In metaphor, we are constrained not to violate the image-schematic structure of the target; this entails that we are constrained not to violate whatever image-schematic structure may be possessed by nonimage components of the target.

Depending on how we define image-schemas, this constraint appears not to be relevant to primary metaphors. If image-schemas are most usefully defined as schematic representations of sensory content, then target concepts such as Causation, Similarity, Functionality, Quantity, etc. do not contain and are not structured by image-schemas (Grady, 2001). They refer to dimensions of mental experience other than those involving image content. We might refer instead to something like a “Superschema Principle” or “Categoriality Principle” which constrains primary metaphors.

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4 Many primary target concepts, such as Similarity and Achieving and Objective have no sensory content whatever. A smaller set, including Happiness and some other emotional concepts, may be associated with bodily sensations, but certainly are not primarily sensory in the way that Brightness or Heaviness are.

5 I have sometimes used the term “image content” to refer to meanings directly referring to sensory experience, and “response” content to refer to the type of non-sensory meaning associated with target concepts, to suggest that these are elements of our interpretation of and response to the world, rather than our physical perception of it (Grady, 1997a, 1997b). Note, though, that response is not intended in a relational sense – target concepts are usually not literal responses to source concepts – but simply as a label for a different category of concepts, which do not directly refer to any type of sensory experience. For instance, Achieving an Objective is not a response to Arriving at a Destination, and Anger is not a response to Heat, but the target concept in each case belongs to the nonsensory (i.e., response) category of concepts, rather than the sensory (i.e., image) category.
An important consequence of shared structure at this level of schematicity is that it coincides largely with parameters that are relevant to grammar — e.g., as discussed by Langacker (1987). If both source and target are construed as bounded entities, or scalar properties, or atemporal relations, then they will be expressible using the same syntax. It is this parallelism which allows metaphorical utterances to have the character they do — i.e., a metaphorical term fits a grammatical and semantic slot which could otherwise be occupied by a literal term, e.g.

That was a stinging (cf. cruel, critical, etc.) remark, all right.

5.3. Condition 3: Covariation

As a corollary to sharing superschematic structure, elements of a scenario must vary directly with each other (to borrow a mathematical notion) if they are to be joined in a metaphorical pairing. That is, a difference in one domain, such a difference in degree or quantity for example, must be associated with a corresponding difference in the other. This is easiest to see in the case of scalar properties, and especially cases where either source causes target or vice versa. For instance, increased anger means increased heat, and increased heaviness means increased difficulty.

Scalar relations also offer clear examples of covariation. For instance, the metaphorical association between spatial nearness and similarity may be motivated by the tendency for objects near each other to be similar, all things being equal (e.g., clouds are all found in the sky, rocks are on the ground, etc.), and/or by the fact that objects within the visual field tend to look more like each other than objects farther apart, all else being equal (because of effects such as illumination and perspective), and/or because of our instinct, beginning in infancy, to place like items near each other because they “go with” each other. In each of these cases, degree of similarity correlates with degree of closeness, whether as a cause or an effect.

Nonscalar properties and relations also exhibit covariation. For example, in the experiential correlation between achieving a purpose and arriving at a destination, both the physical and subjective dimensions of the experience involve a temporal “threshold,” and the same moment defines both events. That is, there is covariation in the temporal dimension.

5.4. Mappings

It should be clear from the preceding discussion that the superschema constraint and the covariation constraint work together to allow for mappings between source and target, including simple mappings such as the following:

<table>
<thead>
<tr>
<th>Target</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult situation</td>
<td>Heavy object</td>
</tr>
<tr>
<td>Enduring difficult situation</td>
<td>Supporting heavy object</td>
</tr>
<tr>
<td>More difficult</td>
<td>Heavier</td>
</tr>
</tbody>
</table>

The mapping here reflects shared arity between construals of source and target, shared categoriality of corresponding elements (i.e., entities with entities, relations with relations), and covariation of the property which is central to the mapping. Each of these aspects of the
mapping in turn reflects correlations between dimensions of experience. (In addition, note that the source concepts refer directly and primarily to sensory experience, while the target concepts are not tied to perception in the same way.)

6. Additional theoretical aspects of primary metaphors

In this section we consider a number of more particular questions about the nature of primary metaphors and their role in conceptual integration networks.

6.1. Elaboration of primary metaphors

If a primary metaphor is the basis for a given metaphorical blend, this is certainly only the beginning of a process. Primary metaphors constitute counterpart connections which ultimately live inside of larger conceptual complexes. Consider the following constructed example:

The town’s aloofness from the immigrants has been a glacier, slow to melt away.

We can point to shared features between the source and target concepts here – for example, both involve slow processes of change, and both involve impressive scale (i.e., the size of a glacier and the aloofness of an entire town – though note that physical size often stands metaphorically for quantity and scale of nonphysical varieties). On the other hand, as we have seen, coldness is not a single feature which both share. Yet coldness, literal and metaphorical, seems to be an important aspect of the metaphor. An analysis of this example might point to the primary metaphorical association between coldness and aloofness as the starting point for the blend. If we like, we can hypothesize a sequential elaboration of this initial conceptualization: the simple initial idea of emotional coldness becomes the “core” of an image that saliently includes slowness and grand scale.

Both the elaboration process and the ultimate product have features typical of blending. The blend is novel, and is constructed dynamically and opportunistically in real time. It also includes selective projection of certain elements of the source domain of glaciers but not all of them — e.g., it exploits the fact that glaciers disappear (i.e., melt) when they grow warmer, but it does not refer to frozen water in particular, nor to rocks and other debris deposited by receding glaciers, and so forth (though of course the blend might be further elaborated to exploit these dimensions of the source domain once that domain has been recruited). In short, the network of conceptual association and projection here is typical of the cases which blending theory focuses on. At its heart, though, is the entrenched mapping between the domains of temperature and affect — rather than an association between aloofness and glaciers which has been noticed spontaneously, for example.

6.2. Primary metaphors as templates

The entrenched pattern which serves as the starting point – i.e., the initial counterpart connection – for the blend in the analysis above has a qualitatively different kind of role from the online processes which are required to achieve the final product. In this sense, it
may be appropriate to consider primary metaphorical patterns as something like templates, as opposed to the more fleshed-out, blended conceptualizations which constitute metaphors per se. Primary metaphors are generic patterns, rather than concrete, vivid instantiations. This is a type of distinction which plays a role in other theories of language — such as terminal nodes versus tree structures (Chomsky, 1965), and constructs versus constructions in construction grammar (e.g., Goldberg, 1996).

The question of whether Difficult-is-Heavy, for example, is a metaphor or merely a metaphorical template is largely a terminological one, but may nevertheless help clarify the distinction between the processes of blending, the products of those processes, and inputs to those processes which arise from cognitive sources other than blending itself. This type of view, of course is a natural fit with the architecture of blending theory, which allows for multiple levels of conceptual relationships.

6.3. Perceptibility as a guiding principle

Fauconnier and Turner (2002) have proposed that one of the guiding principles of blending is the drive to create conceptualizations that match ‘human scale’ in various senses. Slow historical processes are conceptualized as much quicker events that can be easily observed, complex causality involving widely distributed entities (e.g., change in the US economy) is conceived as a simple event involving a single person (e.g., “the economy stumbled”), and so forth. Blending theory’s very plausible position is that compression of these sorts is a response to cognitive predispositions which favor scenes of a certain kind, which humans are best prepared to understand and participate in.

In a very similar fashion, it is likely that perceptibility is a guiding principle of conceptualization. The importance of sensory perception in cognition is self-evident, and has also been thoroughly examined from various philosophical perspectives. Furthermore, there is growing understanding within the neurosciences of how perceptual systems operate and the ways in which the central nervous system is organized around dealing with sensory input (viz. the importance of mechanisms of selective attention).

While there is certainly a relationship between the two, perceptibility and human scale are independent parameters. For instance, anger, difficulty, and similarity are human scale concepts, but lack perceptual content, which is presumably why we commonly construct metaphorical conceptualizations of them. Primary metaphors are one of the chief mechanisms by which we add perceptibility to cognitive representations.

6.4. Deconflation

Christopher Johnson (1997) has argued that at least some metaphorical usages may reflect early stages of lexical acquisition during which senses that are literal and metaphorical from the adult point of view cannot be distinguished by the child using contextual cues. For example, children regularly hear the word see used in contexts where both the literal sense pertaining to vision and the metaphorical sense pertaining to knowledge are relevant, e.g.:

Let’s see what’s in the box.
This type of context, which corpus data suggests is common, would not allow a child to
distinguish which sense of the word is intended — ‘visually perceive’ or ‘learn’ or both.
The result hypothesized by Johnson is that the child develops a ‘conflated’ sense of the
word, referring to both visual experience and knowledge. The shared syntax of source and
target are part of what makes conflation possible; both senses of see may occur in the same
construction, since both refer to a punctual event involving two participants, Experiencer
and Stimulus. It is only later, as the child acquires fuller understandings of each domain,
that the word’s senses are ‘deconflated’ and become distinct, with one felt to be less central
or literal than the other.

One possible way of accounting for the conventional metaphoric projection of visual
concepts onto the domain of thought and understanding, then, is to suggest that children
arrive very early at a conceptualization which combines elements of both these domains,
and that adults’ metaphorical usages of see are therefore recapitulations of an entrenched
blend. It is not clear, though, that this type of account could apply to primary metaphors in
general. Johnson conceives of the deconflation principle as an explanation of how
particular polysemy patterns arise — e.g., the multiple senses of see, of from and of
particular syntactic constructions. It is a hypothesis about linguistic usage. In order to
apply the principle to other primary metaphors, we would have to find relevant lexical
items that a child encounters regularly in the type of ambiguous contexts cited by
Johnson, and which consequently acquire conflated senses. For instance, what would be
the ambiguous lexical item central to the development of Anger-as-Heat? It seems
unlikely that children hear words like hot used regularly in contexts where they could be
referring either to temperature or emotion — though of course this is an empirical
question.

More generally, it is unclear that early conflated conceptualizations should be
considered blends. If children do not have clearly developed, and distinct, representations
of the domains in question, then the mechanisms of blending – involving counterpart
connections between distinct domains, and selective projection from those domains – may
not apply.

Even if deconflation does not prove to be an explanation for primary metaphors
in general, it is certainly a closely related phenomenon. Conflation, in fact, depends
on the type of recurring correlation in (the child’s) experience which is the basis
for primary metaphors. In other words, both conflation and primary metaphors
can be seen as effects of the same experiential cause (see Grady and Johnson, 2000)
(Fig. 3).

6.5. Universal patterns?

While it is unlikely (and very unlikely to be demonstrated) that any particular
metaphorical pattern shows up in every natural language, some are very widely distributed,
as we have seen, and may well represent patterns of conceptualization which are nearly
universal. Other primary metaphors appear to be less crosslinguistically common, however.
Difficulty-as-Heaviness is extremely widespread, and there may be no languages which
lack a common word related to ‘heaviness’ that is also conventionally used to refer to
difficulty or stress. But the pattern associating similarity with closeness – as in English “These two textures are close but not identical” – does not seem to be as universal. Examples can be found in Indonesian (men-dekat ‘approach; resemble’), Chinese (jie jin ‘approach; resemble’), and Irish (gabh/teigh le ‘go with; resemble’), but are less evident in other languages such as Turkish and Japanese.

In short, primary metaphors are patterns which are likely but not certain to arise as patterns which blending processes can draw upon. This situation illustrates the role of motivation, as opposed to predictability, in the study of conceptual and linguistic patterns (see Lakoff, 1987): the association between similarity and closeness is motivated, and therefore likely to arise and become entrenched, but not certain to. We can expect that primary metaphorical patterns are cognitive resources available for recruitment by speakers of many, but not all languages.

An interesting question for future research would be whether metaphors with the properties of primary metaphors could arise from culturally specific (or even personally specific) correlations in experience, as opposed to the universal aspects of human experience discussed here.

7. Analogical metaphors revisited

While correlation-based primary metaphors are an important basis for metaphorical blends, analogy plays an important role in many other cases. It is easy to find metaphors which are not explainable in terms of the kinds of correlations between basic dimensions of experience which we have considered here. I have previously argued (Grady, 1999) that there is an important difference between metaphors based on correlation and those based instead on the more recognized foundation of shared features (including those following
the generic is specific pattern). An example cited by Coulson and Oakley (this volume) illustrates several of the properties of ‘resemblance metaphors’:

You’re the toner in my Xerox machine.

This metaphorical compliment (?) is based on the idea that toner is an essential supply, and expresses the proposition that the addressee is important to the speaker, and makes things possible which otherwise would not be (happiness, living a good life, etc.). Both toner and the person share a property such as ‘important’, ‘essential’. This metaphor involves no correlation in experience between basic dimensions of perceptual and non-perceptual experience.

Importantly, this is also the kind of metaphorical comparison which can be generated on the spot. As opposed to the fixed and finite set of primary metaphor patterns, this type can be generated at will, limited only by our own ability to construe two entities as sharing some property.

Metaphors of this sort truly appear to be variations on the blending theme, as characterized by Fauconnier and Turner’s optimality principles, for example. We are able to seize on a feature (or more than one feature) shared by any two given entities and construct a blend in which one stands for the other in particular ways. These kinds of utterances are parade examples of the dynamic, opportunistic and generative processes that blending theory offers such powerful tools for analyzing. By contrast, primary metaphors are an established set of counterpart connections, from which we draw on a regular basis. They form the basis of the metaphor system of a given language, and possibly a universal system of metaphors which guide human conceptualization more generally.

8. Conclusion

Conceptual integration, as conceived by theorists in the field, is such a pervasive process that it may be the single most defining capacity of cognitively modern human beings (Fauconnier and Turner, 2002: 183–187). In opportunistic fashion, blending interacts with a wide variety of other cognitive faculties and resources – memory, attention, language, categorization, learning, etc. – perhaps all of them. But as Fauconnier and Turner point out, while blending may be part of (nearly) every story relating to human cognition, it is rarely, if ever, the whole story. Complementary sciences are needed in order to complete the picture of how any given blend operates, including the science of similarity or analogy, the science of attention, the science of categorization, and many more. Among these is the science of metaphors. Metaphorical blends are a variety of blend, but understanding the processes of conceptual integration does not tell us everything we need to know about how metaphorical conceptualizations come to be. In particular, there are types of metaphoric connections between concepts – including primary metaphors as well as patterns of personification and synesthetic metaphor – which operate by their own principles, and are more like inputs to the processes of blending than products of them.

Among these distinctive varieties, primary metaphors hold a special place because they are the basis for so many figurative conceptualizations, many of which we hardly notice.
are not literal. These are conceptual associations which create the illusion of similarity – it is easy to lose sight of the fact that coldness and lack of emotion, for example, are fundamentally different and incommensurable, just as height and quantity are. The associations in our experience are so strong that the aloofness of a group of people is felt to be similar to the coldness of a glacier unless we focus consciously on the relationship between them. People “just do” think in terms of such metaphoric patterns and the blends which build upon them.

References

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