

Metonymy and Conceptual Blending

Seana Coulson and Todd Oakley

1. General Definitions of Conceptual Blending

Conceptual blending theory offers a general model of meaning construction in which a small set of partially compositional processes operate in analogy, metaphor, counterfactuals, and many other semantic and pragmatic phenomena. Discussed at length in Fauconnier & Turner (1998), Coulson (2000), and Oakley (in preparation) blending involves a set of operations for combining dynamic cognitive models in a network of *mental spaces* (Fauconnier, 1994), or partitions of speakers' referential representations. Below, we discuss the role of metonymy in a range of conceptual blends that span a continuum from instances of ordinary language use to examples of human creativity and artistry operating at its highest pitch. Our examples include uses of the idiom *blowing your own horn*, literary blends in the writings of the American author Ernest Hemingway, and metonymic blends in the sculpture of Viktor Schreckengost.

1.1 Mental Space Theory

Mental spaces contain partial representations of the entities and relationships in any given scenario as perceived, imagined, remembered, or otherwise understood by a speaker. Elements represent each of the discourse entities, and simple frames represent the relationships that exist between them. Because the same scenario can be construed in multiple ways, mental spaces are frequently used to partition incoming information about elements in speakers' referential representations.

(1) Seana thinks the statue is hideous, but Todd thinks it's just wonderful.

For example, (1) prompts the reader to construct two mental spaces, one to represent Seana's opinion of the statue, and one to represent Todd's:

Seana	Todd
Thinks	Thinks
=====	=====
s	s'
hideous(s)	wonderful(s')

One virtue of mental space theory is that it explains how the addressee might encode information at the referential level by dividing it into concepts relevant to different aspects of the scenario. However, by partitioning the information, this method also creates a need to keep track of the relationships that exist between counterpart elements and relations represented in different mental spaces.

Consequently, the notion of *mappings* between mental spaces is a central component of both mental space theory and the theory of conceptual blending. A *mapping*, or *mental space connection*, is the understanding that an object or element in one mental space corresponds to an object or element in another. For example in (1), the sentence about Seana and Todd's respective opinions about the statue, there is an identity mapping between the element *s* that represents the statue in Seana's opinion space, and element *s'* that

represents the statue in Todd's opinion space. The mental spaces framework thus allows one to represent the fact that the very same statue is referred to in "the statue is hideous" and "it's just wonderful," in spite of its disparate properties in the two opinion spaces.

Besides identity, such mappings can be based on a number of relationships, such as similarity, analogy, and other pragmatic functions. Once linked, the *access principle* allows speakers to refer to an element in one space by naming, describing, or referring to its counterpart in another space. Interestingly, part of Fauconnier's (1994) justification for the access principle allowing reference across different spaces was the existence of similar connectors operating within a single mental space. For example, Fauconnier suggests that a pragmatic function linking hospital patients to their medical conditions licenses the metonymic reference to the patient in (2).

(2) The gastric ulcer in room 12 would like some coffee.

Just as pragmatic functions connecting (say) patients and their illnesses can allow speakers to access and refer to an associated element in the same mental space (see Nunberg, 1978 for extensive review of pragmatic functions), cross-space mappings based on identity and analogy can allow speakers to access and refer to one element by naming or describing its counterpart in a completely different space.

1.2 Conceptual Blending Theory

A development of mental space theory, the theory of conceptual blending was set up to account for cases such as (3) in which some of the content of two or more mental spaces is combined to yield emergent structure.

(3) Coke Flows Past Forecasts: Soft drink company posts gains

This deceptively simple headline involves a combination of a conventionalized metonymy between a corporation (Coca Cola, Inc.) and the signature product of that corporation, as well as a metaphoric construal of Coca Cola, Inc.'s profits in the first quarter of 2001. Although metonymic reference occurs in both (2) and (3), the meaning construction in (3) is slightly more complicated. Example (2) relies on a metonymic link between a patient and his condition to access the patient, and the phrase "wants some coffee" is a perfectly appropriate predication for the patient (albeit not a healthy one given his condition). In (3), by contrast, "flows past forecasts" is an appropriate *metaphoric predication* for the Coca Cola corporation's profit, and an appropriate *literal predication* for the Coca Cola corporation's best known product. So, while the "Coke" in (3) is mainly construed as a corporation, it would appear to have some of the properties of the soft drink that corporation produces.

1.2.1 Conceptual Integration Networks

In conceptual blending theory, the way in which the meaning of "Coke" in (3) appeals simultaneously to conceptual structure from multiple domains is captured in a *conceptual integration network* (CIN). A CIN is an array of mental spaces in which the processes of conceptual blending unfold (Fauconnier & Turner, 1998). These networks consist of two or more *input* spaces structured by information from discrete cognitive domains, an optional *generic* space that contains structure common to all spaces in the network, and a *blended*

space that contains selected aspects of structure from each input space, and frequently, emergent structure of its own. Blending involves the establishment of partial mappings between cognitive models in different spaces in the network, and the projection of conceptual structure from space to space.

The CIN to represent (3) involves 2 input spaces, a soft drink space, and a corporation space. In the soft drink space, an element d is set up to represent "Coke", and is structured by a frame for soft drinks (viz. the element d is construed as having the properties of the sugary, carbonated beverage drunk by millions of people every day). In the corporation space, c' represents the Coca Cola corporation that manufactures Coke. Though the beverage and the company that makes the beverage have very different properties, the elements d' and c' are linked by a conventional metonymy that allows corporations to be identified by their products. The corporation space also includes an element p' that represents the profit generated by Coca Cola, Inc. during the first quarter of 2001, and f' to represent the predicted profit for the same quarter (viz. the economic forecast). Conceptual structure in the corporation space involves a frame for corporate profit, and for evaluating corporate profits. Moreover, a conventional metonymy between corporations and their profits links elements c' and p' .

Soft Drink Input	Corporation Input
=====	=====
d	d'
	c'
	p'
	f'

The blended space in this network contains element c^* linked by identity to d in the soft drink space, and by metonymy to p' (in the corporation space). While conceptual structure in the input spaces comes from the domains of soft drinks and corporations, the blended space includes partial structure from each of the inputs as well as emergent structure of its own. Consequently, element c^* has some of the properties of Coke (in that it is a liquid), and some of the properties of Coca Cola, Inc.'s first quarter 2001 profit (in that it was greater than the forecasted profit).

Besides the hybrid soft-drink/profit element, the blend in (3) is notable in the way that it recruits c^* 's amalgam of properties to construe the relationship between Coca Cola's actual and predicted profit. Objectively considered, the relationship between actual and predicted profit is a static mathematical one. However, the use of the verb "flowed" suggests (3) is a description of motion. This phenomenon, known as fictive (or abstract, or subjective) motion has been well-studied by Langacker (1987) and Talmy (2000). In addition, Fauconnier (1997) has noted that fictive motion constructions involve a blend between an abstract motion scenario and a static representation of the relationship between two or more objects referred to in the particular construction at hand.

(4) The blackboard goes all the way to the wall.

For example, (4) involves a blend of a static construal of the spatial extent of the blackboard (spatial input) with an abstract, image schematic, understanding of a trajectory that moves relative to a reference point,

or landmark. There is a mapping between the blackboard and the trajectory and these two elements are fused in the blended space. Similarly, there is a mapping between the wall and the landmark, and these two elements are fused in the blended space. In the motion input, the trajectory's motion ends at the landmark. Similarly, in the blended space, the motion of the blackboard/trajectory ends at the wall/landmark. The path of motion can then be mapped onto the spatial input to be construed as the spatial extent of the blackboard.

Spatial Input	Blended Space	Motion Input
=====	=====	=====
blackboard	blackboard/trajectory	trajectory
wall	wall/landmark	landmark
(static)	(motion)	(motion)

The fictive motion in (3) can be analyzed similarly by including a third input space to the CIN (see figure 1). The third input is structured by a schematic characterization of the fictive motion schema in which a trajectory moves along an abstract path with a reference point (as in Fauconnier, 1997).

Soft Drink Input	Corporation Input	Motion Input
=====	=====	=====
d	d'	
	c'	
	p'	t'' (trajectory)
	f	l'' (landmark)

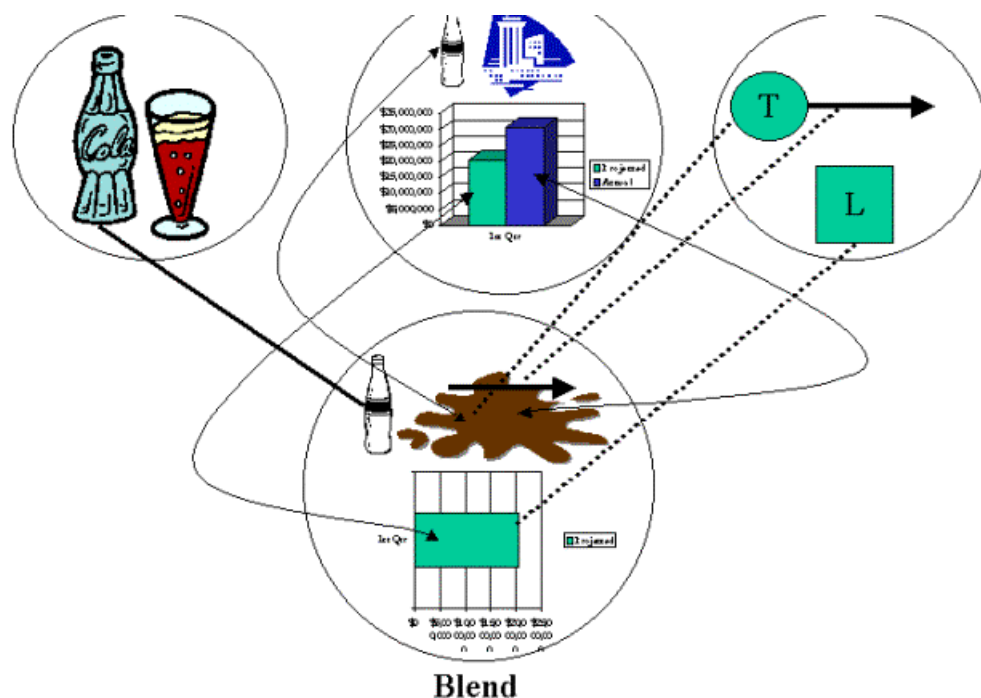
For the fictive motion construal, the most important mappings are between p' , the profit in the corporate input, and t'' , the trajectory in the motion input, and between f' , the forecast in the corporate input, and l'' , the landmark in the motion input. Elements p' and t'' are mapped onto c^* in the blend. Similarly, f' and r are mapped onto f^* . A static relationship between the actual and the predicted profit is thus construed as the abstract motion of the blended soft-drink/profit/trajectory c^* element *past* the blended forecast/landmark f^* element.

The implications that the spatial relationships between elements in the blended space have for their counterparts in the economic space are rooted in conventional metaphoric mappings between progress and movement along a path (see Lakoff, 1993 for review). Consequently, the motion of c^* past f^* (viz. the movement of the Coke past the forecast/reference point) can be construed as Coke's actual profits exceeding their predicted profits. The expression of a static mathematical relationship in terms of motion results from conceptual blending, a process ultimately aimed at allowing conceptual structure from connected mental spaces to be integrated in a single cognitive model. Moreover, the particular verbiage of (3) – the expression of fictive motion in the domain of liquids – is possible only because of a chain of metonymies from products to the corporations that make them, and from corporations to the profits they earn.

Soft Drink Input

Corporation Input

Motion Input



The point here is that natural language constructions (in this case a headline from the business page of *USA Today*, a widely read American newspaper) frequently combine metonymic and metaphoric mappings not only to exploit inferential structure available in the trigger spaces (in the sense of Fauconnier, 1994 and Nunberg, 1978), but to combine structure from multiple triggers in novel ways. Coulson & Oakley (2000), for example, discuss the blending in the headlines "Tennessee Tramples Kentucky" and "Overseas Ballots Boost Bush" which involve conventional metonymies between states and universities, universities and their football teams, politicians and their votes, as well as metaphoric mappings between combat and sports, and between greater quantities and greater heights. One advantage of the blending framework is that it allows the treatment of examples like (3) that require many sorts of conceptual mappings to be set up in parallel in the course of meaning construction.

2. Optimality Principles

The "products" of these parallel mappings, however, are more influential when they adhere to a set of specific principles known as the optimality principles, a set of constraints under which blends are most effective. Fauconnier & Turner (1998) argue for 6 such optimality principles: (i) the *integration principle*, that representations in the blended space can be manipulated as a single unit; (ii) the *topology principle*, that relations in the blend should match the relations of their counterparts in other spaces; (iii) the *web principle* that the representation in the blended space should maintain mappings to the input spaces; (iv) the *unpacking principle*, that given a blended model, the interpreter should be able to infer the structure in other spaces in the network; (v) the *good reason principle* that creates pressure to attribute significance to elements in the blend; and (vi) *metonymic tightening* that when metonymically related elements are projected into the blended space, there is pressure to compress the "distance" between them.

Despite their poetic names, most of these principles invoke standard pressures that obtain in all mapping problems (see Hofstadter, 1995 for review). The topology principle, for example, exerts normative

pressure to construct and maintain mappings in such a way as to preserve relational structure. In research on analogical reasoning, this pressure is referred to as the structure mapping principle (see Gentner & Markman, 1997 for review). In research on metaphorical mapping, this pressure is referred to as the invariance hypothesis, the observation that the underlying mappings in metaphoric expressions are almost always based on shared image schematic structure (see Brugman, 1990; Lakoff 1990; and Turner, 1990). The web principle, that the representation in the blended space should maintain its mappings to the input spaces, amounts to the extension of the access principle to conceptual content in blended mental spaces. Satisfaction of the web principle is what allows one to access elements in the blend with names and descriptions from the input spaces, as well as what allows the projection of structure from the blended space to other spaces in the network. Finally, the unpacking principle, the dictate that given a blended model, the listener should be able to construct structure in the other spaces in the network, can be thought of as pressure to use conventional mapping schemas that facilitate comprehension. Thus construed, the unpacking principle applies pressure to use conceptual metaphors, such as the link between seeing and knowing, and conventional metonymic mappings, such as part-for-whole, producer-for-product, or container-for-contents.

The integration principle, the good reason principle, and the metonymic tightening principle all specifically refer to the blended space, and consequently, are unique to Fauconnier & Turner's theoretical framework. However, we note that the integration principle, pressure to conceptualize the event with an easily manipulable representation, is reminiscent of Miller's (1957) concept of chunking, as well as its more formal incarnation in Anderson's (1983) ACT-* model. Chunking is a process by which one can assimilate a great deal of new information by relating it to knowledge representations in long-term memory. Fauconnier & Turner's insight in blending theory is that comprehenders can "chunk" information by relating it to various juxtapositions of partial structure from multiple domains.

The optimality principles get their name from a paradigm in phonology that explains phonological regularities by recourse to a set of interacting constraints. Like their namesake, satisfaction of Fauconnier and Turner's optimality principles is selective, and satisfaction of one constraint is often inconsistent with the satisfaction of another. For example, the blend in (3) fulfills the integration principle because the cognitive model set up in the blend concerns a single scene (of Coke literally flowing past the forecast). However, it violates the topology principle because element c^* in the blended space maps onto both c' and p' in the corporation space. We suggest that metonymic expressions often embody this tradeoff between the topology principle, that is, the dictate that models in each of the mental spaces in the network share as much relational structure as possible, and the integration principle, that is, the dictate that the events in the blended space form an integrated mental scene. In general, the presence of metonymic connections in the blend performs the crucial function of holding together the network of mental spaces that are necessary for reasoning on a particular topic to be sustained over time.

3. Metonymic Shifts

In their book *Mental Leaps*, Holyoak and Thagard (1995) claim that the difference between metaphor

and analogy is that metaphors, especially literary ones, are subject to "loose" and "shifting" mappings which are the side-effects of metonymy. Treating it as a somewhat suspect technique, Holyoak & Thagard argue that metonymy's intrusion into metaphoric language places metaphor outside the explanatory bounds of a theory of analogy. An unbridled force at large in the literary universe, metonymy leads at best to analogical inconsistency, at worst to incoherence. In support of their position, Holyoak & Thagard point to the following excerpt from the writings of Ernest Hemingway:

His talent was as natural as the pattern that was made by the dust on a butterfly's wings. At one time he understood it no more than the butterfly did and he did not know when it was brushed or marred. Later he became conscious of his damaged wings and of their construction and he learned to think and could not fly anymore because the love of flight was gone and he could only remember when it had been effortless (Cited in Holyoak & Thagard, 1995:224).

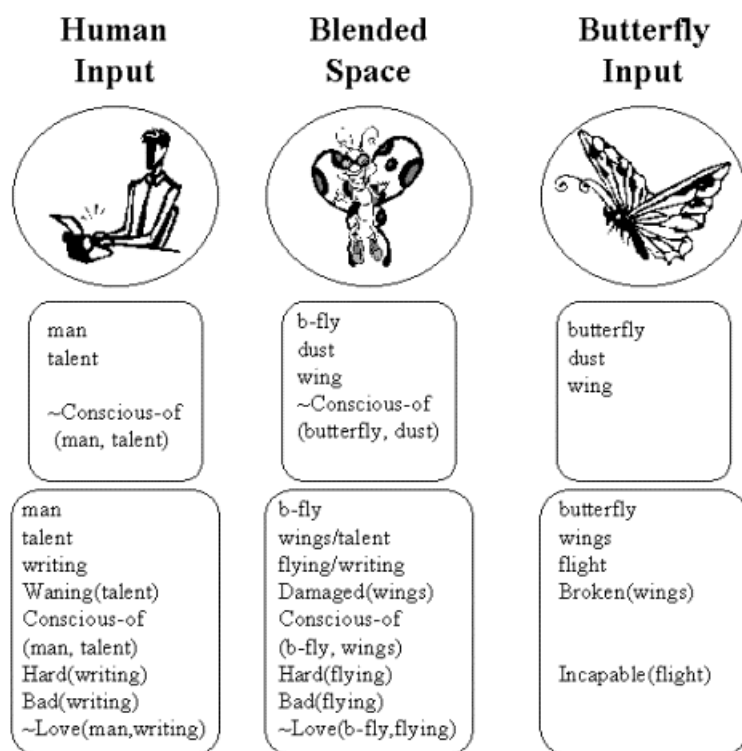
Analyzing the passage, Holyoak & Thagard point to the fact that the writer's talent is initially mapped to the pattern of dust on the butterfly's wings, and later to the wings themselves. Further, they point out that there is no causal relationship between patterns on a butterfly's wings and its ability to fly, and no reason why consciousness of wings should affect the butterfly's ability to fly. In blending theory, analogical mismatches like this are frequently used to motivate the need for a blended space analysis. Indeed, in their discussion of this example, Holyoak & Thagard resort to the use of slashes to represent the conceptual fusion of ideas: "A butterfly's pattern is not causally related to its flight, so if talent is mapped to the pattern, then there is no reason why consciousness of the talent/pattern should interfere with the ability to exercise it," (Holyoak & Thagard, 1995: 224).

In fact, one might also note that real butterflies cannot properly be said to be *conscious* of anything, let alone be the sort of intentional creature whose consciousness of a particular ability impairs the exercise of that ability. There is indeed an analogical mismatch between the domain of the man's consciousness of his own talent and the realistic domain of butterflies. But where Holyoak & Thagard suggest the passage involves metaphor "extended by the associative aura created by metonymy," we suggest it prompts a blended conceptualization of the writer and the butterfly that exploits both metaphoric and metonymic mappings. The first sentence, an explicit comparison between the man's talent and the dust on a butterfly's wings serves to set up the two input spaces for the ensuing blend: a "human" space with the man and his talent, and a "butterfly" space with the butterfly and the dust. The blend between the two spaces is prompted by the second sentence, "At one time he understood it no more than the butterfly did and he did not know when it was brushed or marred."

Although the sentence begins by referring to elements in the human space, the focus gradually shifts to a blended space that concerns a hybrid man/butterfly, exploiting partial structure from each of the input spaces. For example, the initial use of the pronoun "he" ("he understood") refers to the man, while the second refers to the hybrid man/butterfly ("he did not know when it was brushed or marred.") The transition to reference to the blended space is mediated by an ambiguity in the elided phrase "the butterfly did" in "he

understood it no more than the butterfly did." This phrase could be interpreted as a comparison between the man's understanding of his artistic talent and the butterfly's understanding of the dust pattern on its wings; or between the man's understanding of his talent and the butterfly's understanding of the man's talent; or even between the man's understanding of his talent and the butterfly's understanding of its own talent. Similarly, the first use of the pronoun "it" (in "he understood it") refers to the man's talent, while the second (in "he did not know when it was brushed or marred,") can be understood as referring alternately to the pattern of dust on the butterfly's wing, the man's talent, or an element in the blended space with the attributes of both the dust pattern and the man's talent.

The multiple interpretations for this sentence can be captured in the conceptual integration network in figure 2. In the human space, the man does not understand his artistic talent; in the butterfly space, the butterfly does not understand the pattern of dust on its wings. In the blended space, the "he" is a butterfly with the intentional powers of a human, and the dust pattern is a feature of its wings that it *could* potentially understand, but doesn't. The initial blend conforms well to the first three optimality principles: integration, topology, and web. A cognitive model of a butterfly who is not conscious of the dust pattern on his wings is an integrated representation that is easy to manipulate. It conforms to the topology principle because the relational structure in the blended space corresponds to relational structure in the inputs. Moreover, it conforms to the web principle because the mappings between elements in the blended space and their counterparts in the input spaces are consistent.



However, the third sentence ("Later he became conscious of his damaged wings and of their

construction and he learned to think and he could not fly anymore because the love of flight was gone and he could only remember when it had been effortless,") employs slightly different mappings between the elements in the blend and the inputs, thereby violating the web principle. As Holyoak & Thagard point out, the man's talent is initially mapped to the dust pattern on the butterfly's wings, but shifts to the wings themselves. This violation of the web principle is offset by metonymic tightening, the pressure to "compress" metonymically related elements in a blended space. In this case, the metonymic relationship of adjacency between the butterfly's wings and the dust pattern licenses a mapping between the man's talent – formerly mapped to the dust on the wings – and the wings themselves.

The need for a blended analysis of the third sentence is readily apparent as it makes little sense to talk about a man "conscious of his damaged wings", nor of a butterfly who, having lost the love of flight, "could only remember when it had been effortless." Though the mapping of the man's talent has shifted from the dust pattern on the wings to the butterfly's wings themselves, the mapping between the man and the butterfly remains intact, and the blended space again features a hybrid creature with the body of a butterfly and the cognitive and emotional capacity of the man represented in the human space. With the new mapping scheme established, the blend in the third sentence satisfies both the web and the topology constraints as the butterfly's wings continue to map to the man's talent in a systematic way. For example, damaged wings correspond to fading talent, inability to fly (an action that requires intact wings) corresponds to the man's inability to employ his talent (viz. writer's block), and the love of flight (enjoyment in the ability to use the wings for their intended purpose) corresponds to the man's love of writing (enjoyment in the ability to exercise his talent).

Though Hemingway's passage does indeed employ a series of *analogical mappings* between conceptual structure taken variously from the domains of butterflies and humans, it does not set up an *analogy* between the two domains. That is, Hemingway does not exploit the reader's knowledge of butterflies to explicate notions pertaining to artistic talent. Rather, he exploits the reader's ability to integrate conceptual structure from disparate domains that enable her to understand and empathize with the aging artist. While the reader may not understand the artist's joy in practicing his art, she can imagine the thrill of flight. Moreover, having imagined the thrill of flight, the reader is in a better position to empathize with the loss of this ability, and consequently its counterpart in the human space, the man's ability to write. If anything, the analogy is from the blended conceptualization of the human butterfly to the experience of the aging artist.

Metonymy is used here to shift the mapping schema in a way that violates the topology constraint, but optimizes integration. The metonymically licensed slip is rhetorically motivated because the first blend serves the original motivation of explicating the utter mindlessness of the artist's talent, and the second best serves the rhetorical motivation of explicating the emotive significance of a whole series of events as the artist's ability changes over the course of time. This includes the euphoric nature of the artist exercising his talent, the loss of this ability and the associated regret, as well as the causal sequence of events that produced the loss of talent. In subsequent examples we explore other ways that metonymy licenses different sorts of

blends, and the way in which metonymic mappings affect the interplay of the optimality principles. In particular, metonymic language frequently involves conflict of the integration principle with the web and topology principles.

4. X your own Y

As Coulson (1997, 2000) has argued, the idiom *digging your own grave* entails much more than a straightforward mapping from the source domain of "grave digging" and the target domain of "trouble," primarily because default interpretations of this idiom lead to the inference that the deeper one digs the closer one gets to dying, thus positing a direct causal relationship between grave digging and death where none typically exists. The idiom is also fantastic in that the grave digger and the corpse in a typical grave digging scenario both map onto the same element in the blend. This idiom can be applied to any representation of an individual's actions interpreted as having untoward consequences for which the speaker thinks the individual does not foresee. Applicable target situations can include anything from romantic disaster to academic failure to financial ruin, as in, "You're digging your own financial grave by investing all your money in start-up Internet stocks."

Interestingly, part of the reason this example has been discussed so frequently with respect to blending theory (e.g., Fauconnier & Turner, 1998; Grady, Oakley, and Coulson, 1999 to name but two), is that it cannot be accounted for by approaches to figurative language that involve a strong commitment to the existence of shared conceptual structure in the source and target domains. Indeed, analysis of the "digging" example in terms of conceptual blending is motivated by the violation of the topology principle in the disanalogous mappings that are set up between the grave digger to the wrongheaded agent in the trouble space, and between the act of digging and the wrongheaded act (e.g. investing in internet stocks). In accordance with our observations here, though, this stock example is yet another illustration of the tradeoff between the topology principle and the integration and unpacking principles. For while the "digging your own grave" example violates topology, it does fulfill the integration constraint, allowing the hearer to conceptualize the scenario in an integrated scene. Moreover, it fulfills the unpacking principle by utilizing conventional metaphoric mappings between death and failure (Lakoff & Turner, 1989), holes and situations (Lakoff, 1993), and a conventional metonymic mapping between graves and death (Turner, 1987). The digger causes the grave, which maps metonymically onto death, which in turn maps metaphorically onto the wrongheaded agent's failure. Metaphoric interpretation of the representation in the blended space thus rests crucially on the metonymic identification of the grave with death.

4.1 Blowing Your own Horn

A close relative to *digging your own grave* is *blowing your own horn*, both of which exploit the X-your-own-Y pattern found in non-metaphoric examples, such as "get your own drink," and "play your own instrument." In contrast to these conventional examples, and indeed to the *digging your own grave* idiom, the own-Y in *blowing your own horn* is not used in contradistinction to someone *else's* horn, but rather playing a horn *for oneself* rather than for another. The horn in this case refers metonymically to the object of the

trumpeting. The puzzling thing about "blowing your own horn," of course, is how and why blowing your *own horn* maps onto praising yourself.

The verb *blow* and the noun *horn* provide the verbal cues for opening a mental space representing the act of playing a musical instrument. In this musician space, the focal element "horn" provides the reference point for accessing and filling other slots in the frame such as *musician*. The event represented in this space is the effect associated with producing a certain kind of sound. The musician blows into the horn, which produces a distinctive (and loud) sound, which captures the attention of others (possibly an audience). In fact, in western ceremonies, horn playing is often a scripted part of a procession, admonishing the crowd to pay attention. Blowing a horn, in effect, announces the arrival of a very important person such that the attention of the crowd becomes fixated on that person.

Just as there is a close part-whole relation between a musician and her instrument, there is an even closer part-whole relation between a speaker and her voice. This common part-whole topology establishes a close relationship between the horn blowing input and the praising input we call the Encomium space, reminiscent of the formal genre of speech in which the writer enumerates the achievements and deeds of a living person. Since native speakers of English know that this idiom is about acts of praising, the mental space activates the focal element "speaker" and "voice". Once activated, the speaker role and her most relevant feature map onto the focal elements in the musician space, namely musician and horn.

The two spaces are analogically linked by the generic causal and temporal relation obtaining between distinctive sound produced by a human being and the subsequent effect it has on other minds. In the musician space, the musician blows his horn to draw the audience's attention to some notable occurrence. In the encomium space, the same relation holds between the vocalized act and the subsequent effect it has in getting others to pay attention to the accomplishments, deeds, and character attributed to the individual. This mapping has been lexicalized in the verb "trumpet" meaning to praise. In employing a conventional mapping between encomium and trumpeting, the blend in blowing your own horn conforms to the unpacking principle.

Conformity to this entrenched mapping is also evident in the following attested use of the blowing-your-own-horn blend from a story in the Metropolitan section of the New York Times from September 22, 1998:

"I firmly believe that if you're doing something interesting, you ought to tell people about it," Dr. Olivia said. "And if you're blowing your own horn, do it loudly. There's no sense giving it a little toot."

In this example, Dr. Olivia elaborates the blowing-your-own horn blend with a self-conscious distinction between "blowing" your own horn, and "giving it a little toot." Focusing on the loudness-softness gradient, Dr. Olivia suggests a mapping between the manner of articulation in the blend and the efficacy of the bragging. Soft horn blowing in the blend maps onto less, and less noticeable praise. This elaboration suggests a mapping between the degree of praise and the volume of the trumpet sound – the same mapping that underlies the meaning of the metaphoric expression "muted praise". This in turn implies a mapping

between the praise and the sound, the speaker and the trumpeter. The mappings between elements of a typical encomium space and a ritualized space we call trumpeting royals are listed below.

Typical Encomium	Trumpeting Royals
=====	=====
speaker	trumpeter
hero	royal
praise	sound
voice	trumpet

But, as noted above, the idiom refers to an atypical encomium space in which the speaker is the object of his own praise.

Typical Encomium	Trumpeting Royals	Atypical Encomium
=====	=====	=====
speaker	trumpeter	speaker
hero	royal	speaker
praise	sound	praise
voice	trumpet	voice

A topology preserving mapping would proceed as in the following table:

Typical Encomium	Trumpeting Royals	Atypical Encomium	Atypical Trumpeting
=====	=====	=====	=====
speaker	trumpeter	speaker	trumpeter
hero	royal	speaker	trumpeter
praise	sound	praise	sound
voice	horn	voice	horn

In contrast, the idiom employs a mapping scheme like this:

Typical Encomium	Trumpeting Royals	Atypical Encomium	Blended Space
=====	=====	=====	=====
speaker	trumpeter	speaker	trumpeter
hero	royal	speaker	horn
praise	sound	praise	sound
voice	horn	voice	horn

The violation of the topology principle inherent in the mapping between the horn in the blended space and the object of the praise (viz. the speaker) in the atypical encomium space is supported by a conventional metonymic mapping between musicians and their instruments, as in "The trombone is at his AA meeting tonight." Or, an agent talking to a record producer, "Well, I can get you a drummer, two guitars, and a bass, but you'll have to find your own horn." As in the examples discussed in previous sections, the metonymic mapping between horn and trumpeter in *blowing your own horn* makes it possible to sustain a metaphoric interpretation of the model in the blended space despite the violation of the topology constraint.

5. Apocalypse '42

Viktor Schreckengost's clay sculpture, "Apocalypse '42," features the figure of death, clothed in a German uniform, riding a horse with Hitler, Hirohito, and Mussolini as passengers (see figure 3).



Produced in 1942 at the apogee of Axis domination of Europe and Asia, this sculpture represents the second world war as an instantiation of the Apocalypse. A highly complex blend involving the allegory of the "Four Horsemen of the Apocalypse" from the Book of Revelations, personification metaphors of death (i.e., The Grim Reaper in Judeo-Christian lore), and geopolitical reference, Schreckengost's clay statue exemplifies pictorially our main point: conceptual integration relies on metonymic and metaphoric mappings that involve trade-offs between satisfaction of the integration and topology principles.

Our analysis begins by considering the two input spaces that prompt the construction of a third blended space.

<u>Presentation Input</u>	<u>Apocalypse Input</u>	<u>Blended Space</u>
4 anthropomorphic figures	4 horsemen	4 anthropomorphic figures
1 equine figure	4 horses	1 equine figure

The first space is a Presentation space contributing knowledge of artistic medium: clay and glaze. Specifically this space includes 4 anthropomorphic figures astride a single equine figure. The Apocalypse space contributes minimal information about the Four Horsemen from the Book of Revelations, namely that there are four horses and four horsemen, and that their ride heralds the end of the world. Viewers more familiar with the biblical account will open a version of this space that includes knowledge that the four horsemen are, themselves, personifications of Conquest, War, Plague, and Famine each of which mounts a horse of a different color: Conquest rides a white horse; War rides a red horse; Famine rides a black horse;

Plague rides a pale horse. The two input spaces map counterparts onto each other via a similarity connector, since accessing each space depends on a relation of resemblance between elements in each space. The established similarity mapping, in turn, allows referential structure in one space to trigger referential structure in the other. For instance, Todd can now remark to Seana, "That hideous mass of clay predicted the end of the world in 1942," since referring to the medium of representation can provide indirect mental access to the entity represented.

More interesting metonymic issues come to light as we consider features of the composed blended space. In the blend, four anthropomorphic clay figures sit astride a single equine figure, pictorially representing the Four Horsemen of the Apocalypse quite differently from the way they are represented in the Apocalypse space. This is due, in part, to material constraints imposed by the Presentation space, a mental space which determines final material shape of the statue. That is to say, conceptual integration in this blend works optimally only if the representations can be compressed into one tightly integrated form. Presenting four figures astride one horse satisfies this integration constraint, because it makes efficient use of the presentation space to present an integrated scene. Moreover, the viewer's attempt to satisfy the good reason constraint might result in the construction of a mapping between the integrated horse-and-riders scene as a snapshot of a singular, coordinated activity.

Satisfying the integration constraint entails considerable metonymic tightening, such that the Four Horsemen of the Apocalypse can only afford to ride one horse. As in many of our examples, conformity to the integration principle comes at the expense of a violation of the topology principle. In the blend, the precise allegorical interpretation of the four horsemen is not important, and the metonymic relationship between color and symbolized evil (i.e., the coupling of "red" with "war") obtaining in the Apocalypse space is incidental in the blended space. In the blend, for instance, Death is riding a black horse with a red mane and tail, not a pale horse. In Schreckengost's sculpture, the color correspondences occur only incidentally. "Whiteness," for instance, is not a property of the horse but of three riders: Death's face, Hitler's and Mussolini's head and arms) and their accouterments (i.e., the Japanese flag). Similarly, "paleness" is not a property of the horse but of Mussolini. In the composed blend, the color-horse-rider topology from the Apocalypse space get "metonymically loosened," suggesting that the such color metonymy functions in this CIN as incidental topology (see Fauconnier & Turner 1998).

Above, we focused on the material conditions governing the composition of a conceptual blend made manifest in a medium requiring great economy of space. Below we complete our analysis by considering the referential import of the figures themselves. By our analysis, three input spaces feed the completed blend.

Apocalypse Space

=====

Conquest

White Horse

War

Red Horse

Plague

Pale Horse
 Famine
 Black Horse
 Time: End of Time
 Goal: End Humanity

Axis Space

=====

Germany
 Hitler
 Italy
 Mussolini
 Japan
 Hirohito
 Time: 1942
 Goal: World Domination

Death Space

=====

Figure of Death
 (i.e., Grim Reaper)
 Goal: Cause Death

Blended Space

=====

Hitler
 Mussolini
 Hirohito
 Japanese Flag
 Figure of Death
 Missile
 Horse
 Time: 1942
 Goal: World Domination & End of Humanity

The Axis Powers space is structured gradually as the viewer identifies the figures in the statue as Adolph Hitler, Benito Mussolini, and emperor Hirohito. In mental spaces nomenclature, each clay figure from the Presentation space maps onto each referent in the Axis Powers space by a similarity connector. Once this iconic relationship is established, viewers produce a value-role mapping as each is construed as the leader of his respective country: *Hitler is Leader of Germany*, *Mussolini is Leader of Italy*, and *Hirohito is Emperor of Japan*. The Axis Powers space represents the figures as intentional agents acting in coordination with one another. In this space, each leader stands metonymically for each nation, which, in turn, is understood as part of a corporate entity: a political alliance. Interpreters familiar with modern European history will access relevant background knowledge about the Axis Nations, such as the fact that the first 1936 alliance between Germany and Italy (known as the Rome-Berlin Axis) followed by a second 1940 alliance with Japan and, tangentially with Hungary, Finland, Bulgaria, and Romania. In the Axis Powers space, the individual nations

act as one group.

With the blended construal, the formal features of the sculpture take on new significance. For example, the interpreter may understand the referent scene as an alliance wherein the single horse stands for the Axis Powers, and the singular, coordinated event stands for the intentions and actions of each nation under the alliance. In the blend, but in none of the input spaces, riding the horse stands for the sustained, coordinated effort of the three principal nations to conquer the world, an inference licensed by the leader for nation metonymy. Consequently, the interpreter does not only see Hitler, Mussolini, and Hirohito riding the horse, she sees Germany, Italy, and Japan acting together in a military alliance.

Although the statue involves integration of conceptual structure from the apocalypse space with that in the Axis Powers space, three of the four horses from the apocalypse input are omitted from the blended space. This occurs because of positive pressure to accommodate structure from the Axis Powers space, as well as an absence of pressure to preserve the precise topology of the Apocalypse space. In the blend, as in the Axis space it projects to, the corporate actions of the Axis powers manifest all the evils of the apocalypse in one political alliance. The image of the three axis leaders riding a single horse in the blend can be mapped onto their coordinated actions in the military alliance. Moreover, while the knowledge that the four horsemen of the apocalypse herald the end of the world is important for producing the inferential implications of the blend, the establishment of a precise mapping between particular leaders and particular horsemen of the apocalypse is not. Consequently, there is no need to preserve the metonymic mapping between horse color and personified evil, noted above in our discussion of conformity to the "good reason" constraint.

The blend represents world conquest in terms of horseback riding, thus compressing the complex chain of events involving millions of people to a much more human scale activity involving four people and a horse. Moreover, the completed blend presents a dynamic event whereby the Axis powers ride the horse of the apocalypse. The completed blend also takes on a distinct temporal dimension, wherein the activities of the horse and the horsemen are playing out in 1942. At this point, the meaning of the sculpture's base takes on new significance. With respect to the presentation space the base is purely functional, allowing the sculptor to display his figures with proper perspective. But once the interpreter recognizes that the base is the entire Northern hemisphere, she completes the blend in which the leaders of the Axis nations are currently conquering the entire Northern hemisphere, which, in effect, stands for Western civilization itself.

We have chosen to deal lastly with the most salient figure in the sculpture: Death. In the sculpture, death wears a German uniform, and appears to be the figure actually riding the horse (the others appear as passengers). The Interpreter recognizes the figure as death because its face appears as a skull, thus prompting the well-established metonymic compression of cause and effect, where the effect of corporal decomposition comes to stand for its own cause, death. As Turner (1987, 1991, 1996) has noted, the figure of the grim reaper is an example of the Generic is Specific mapping (i.e., death heralds the death of an individual). The mere presence of death among these figures heralds the death of the West as we know it, a very salient and plausible scenario in 1942. The introduction of death as the fourth horsemen comes about by virtue of

metonymic attribution to Death of elements from other mental spaces in the blend. In our account, the presence of Death in the Apocalypse space automatically opens a mental space for representations of Death as the "Grim Reaper," the common representation of death in Judeo-Christian lore.

It would be odd, however, to represent death in his traditional priestly cowl, robe, and scythe. Instead, Schreckengost represents him in a German uniform, carrying a missile in his right hand. It seems that to bring in wholesale the figure of death means violating the unpacking constraint, insofar as typical personifications of Death space come "packaged" with the features just described. In this instance, violating the unpacking constraint satisfies the good reason constraint. A priestly cowl and scythe do not have the same degree of geopolitical relevance in 1942 as a German uniform and bomb do. The fact that death has to be wearing something means that clothing and accessories can be projected from any mental space in the network. It happens that Death's appearance exploits metonymic relations established in the Axis power's space, such that *military uniform* and *bomb* can stand for both *instruments of war* and *effects of the war*. Satisfying the good reason constraint, in turn, optimizes integration.

Why? We already know that Schreckengost has to choose a fourth horseman to complete his allegorical allusion, but unless he is going to introduce, for instance, the leader of Hungary or Romania or Bulgaria or Finland (none of whom are particularly notorious), he must choose a figure that does not violate the topology of the Axis Powers space. Stalin, for instance, would have been an appropriately menacing choice (even in 1942), but would have disintegrated the corporate image, since Stalin and Russia were enemies to the Axis Nations. Choosing the personification of Death as the fourth horseman (i) is appropriately menacing, (ii) preserves specific topology of the Apocalypse space, and (iii) does not violate the topological relations recruited from the Axis Powers space.

This brings us to the central ambiguity of the piece. Who is responsible for the apocalypse? Like death, the four horsemen are carrying out a divine plan for the end of the world. In the Judeo-Christian tradition, especially, Death is personified as a herald of death, and its heralding is understood to be the proximate cause of an individual's death. In other words, Death is not acting of his own volition (in fact, it is not clear that death has any volition at all), it is merely acting out a divine mandate. But, is the interpreter to suppose that Hitler, Hirohito, and Mussolini, as agents of the apocalypse, are also executing a divine plan? Schreckengost's own commentary suggests as much, when he writes, "In the Four Horsemen of the Apocalypse . . . I saw a strange resemblance to the four beasts let loose on the world today" (Adams 2000: 61).

References to the four beasts, then, refer to the leaders, with death representing the results of their actions; however, Schreckengost's use of the quasi-modal verb phrase "let loose" suggests a more powerful entity permitting them to act, lifting the barrier that holds them from the rest of the world. That an external and more powerful entity is being referred to is not in question. What is in question is what or who is the ultimate instigator of these events? Is it God? Or, is it the sum total of human actions-- including World War I, the Treaty of Versailles, the collapse of the Weimar Republic in 1933, the United State's territorial control

over Hawaii, Chamberlain's policy of appeasement, and so on--that brought forth these beasts? Or, is it some combination of human folly and divine retribution? All of these are plausible interpretations for metaphoric and metonymic mappings.

As complexity increases, trade-offs between optimality principles become inevitable. Comprehending Schreckengost's sculpture involves maintaining certain topological relations from the Apocalypse and Axis Powers spaces such that a total of four horsemen appear and that three of them represent the leaders of the Axis Powers Nations. The final blend integrates the biblical and the historical by preserving these topological relations. However, other topological relations, such as the precise analogical mappings between horse's color, personified evil as rider, and political figure, are not preserved in the blend.

6. Conclusion

As a general model of meaning construction, blending theory posits a small set of partially compositional processes that operate on and constrain a diverse range of semantic and pragmatic phenomena from many different sign systems. Our purpose in this essay was to show how metonymy operates over diverse instances of conceptual blending, as manifest in everyday language use, crafted literary artifacts, and modernist representational sculpture. One consistent finding was the role metonymy seems to play in satisfying different and competing optimality principles during comprehension. For instance, we found that metonymic inference usually facilitates integration at the expense of preserving specific topology, as when the properties of Coca Cola (i.e. flowing liquid) can be used to make sense of phenomena such as the Coca Cola corporation's profits, that are not normally characterized by such properties; or, when Hemingway exploits the reader's ability to integrate information about butterflies and writers to build a sympathetic composite portrait of the aging artist; or, when the a *horn* actually becomes the *object of praise* with *blowing your own horn*. Similarly, some of the other optimality principles, such as good reason, exploit metonymic inference to facilitate integration, but do so by concomitantly preserving topology at higher levels of abstraction, as when the figure of Death trades its usual robe and cowl for a German uniform in Schreckengost's apocalyptic fantasy.

These analyses suggest that meaningful acts are not always supported by orderly structures with neat analogical mappings between domains, but, rather, unruly, ad hoc, conglomerations that, nonetheless, adhere to a few basic principles which Fauconnier and Turner have labeled optimality constraints. By focusing on expressions that employ both metaphor and metonymy, we have attempted to show how the two sorts of mappings can be used to combine structure in novel ways. Though such examples often violate the topology principle, that is, the pressure to preserve shared relational structure, they do so in order to promote the construction of an integrated mental scene useful for the projection of inferences. In general, the presence of metonymic connections allows us to maintain connections between networks of mental spaces comprised of opportunistic juxtapositions of conceptual structure from distally related domains, that nonetheless appear to be important for reasoning. Understanding the role metonymy plays in this process is thus crucial for understanding how human beings make meaningful things.