CONCEPTUAL BLENDING, FORM AND MEANING[1]

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1. Introduction

Conceptual blending is a basic mental operation that leads to new meaning, global insight, and conceptual compressions useful for memory and manipulation of otherwise diffuse ranges of meaning. It plays a fundamental role in the construction of meaning in everyday life, in the arts and sciences, and especially in the social and behavioral sciences. The essence of the operation is to construct a

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partial match between two input mental spaces, to project selectively from those inputs into a novel 'blended' mental space, which then dynamically develops emergent structure. Mental spaces are small conceptual packets constructed as we think and talk, for purposes of local understanding and action –they are very partial assemblies containing elements, structured by frames and cognitive models. It has been suggested that the capacity for complex conceptual blending ("double-scope" integration) is the crucial capacity needed for thought and language.

In this article, we will look at language (and more specifically grammar) as a culturally entrenched means of creating and transmitting blending schemes. We will do so by considering the relationships between linguistic forms and patterns of meaning construction through conceptual integration and compression.

1.1. A simple example of conceptual blending: the boat race

A famous example of blending is "the boat race" or "regatta". A modern catamaran is sailing from San Francisco to Boston in 1993, trying to go faster than a clipper that sailed the same course in 1853. A sailing magazine reports:

> As we went to press, Rich Wilson and Bill Biewenga were barely maintaining a 4.5 day lead over the ghost of the clipper *Northern Light*, whose record run from San Francisco to Boston they're trying to beat. In 1853, the clipper made the passage in 76 days, 8 hours[1].

Informally, there are two distinct events in this story, the run by the clipper in 1853 and the run by the catamaran in 1993 on (approximately) the same course. In the magazine quote, the two runs are merged into a single event, a race between the catamaran and the clipper's "ghost". The two distinct events correspond to two input mental spaces, which reflect salient aspects of each event: the voyage, the departure and arrival points, the period and time of travel, the boat, its positions at various times. The two events share a more schematic frame of sailing from San Francisco to Boston; this is a "generic" space, which connects them. Blending consists in partially

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[1] "Great America II", *Latitude 38*, vol. 190, April 1993, p. 100.

matching the two inputs and projecting selectively from these two input spaces into a fourth mental space, the blended space:

Generic space

Input space 1   cross-space mapping   Input space 2

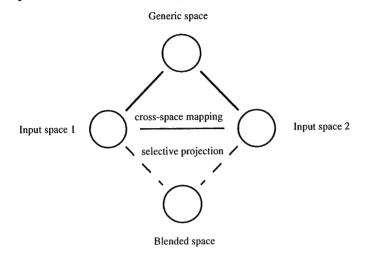selective projection

Blended space

Figure 1: the four-space model

In the blended space, we have two boats on the same course, that left the starting point, San Francisco, on the same day. Pattern completion allows us to construe this situation as a race (by importing the familiar background frame of racing and the emotions that go with it). This construal is emergent in the blend. The motion of the boats is structurally constrained by the mappings. Language signals the blend explicitly in this case by using the expression "ghost-ship." By "running the blend" imaginatively and dynamically –by unfolding the race through time– we have the relative positions of the boats and their dynamics.

Crucially, the blended space remains connected to the inputs by the mappings, so that real inferences can be computed in the inputs from the imaginary situation in the blended space. For example, we can deduce that the catamaran is going faster overall in 1993 than the clipper did in 1853, and more precisely, we have some idea ("four and a half days") of their relative performances. We can also interpret the emotions of the catamaran crew in terms of the familiar emotions linked to the frame of racing.

The "boat race" example is a simple case of blending. Two inputs share structure. They get linked by a cross-space mapping and projected selectively to a blended space. The projection allows

emergent structure to develop on the basis of composition (blending can compose elements from the input spaces to provide relations that do not exist in the separate inputs), pattern completion (based on background models that are brought into the blend unconsciously), and elaboration (treating the blend as a simulation and "running" it imaginatively).

1.2. The network model

Conceptual blending is described and studied scientifically in terms of integration networks. In its most basic form, a conceptual integration network consists of four connected mental spaces: two partially matched input spaces, a generic space constituted by structure common to the inputs, and the blended space. The blended space is constructed through selective projection from the inputs, pattern completion, and dynamic elaboration. The blend has emergent dynamics. It can be "run", while its connections to the other spaces remain in place. Neurobiologically, it has been suggested that elements in mental spaces correspond to activated neural assemblies and that linking between elements corresponds to neurobiological binding (e.g. co-activation). On this view, mental spaces are built up, interconnected, and blended in working memory by activating structures available from long-term memory. Mental spaces can be modified dynamically as thought and discourse unfold.

Four main types of integration networks have been distinguished: Simplex, Mirror, Single-Scope, Double-Scope. In Simplexes, one input consists of a frame and the other consists of specific elements. A frame is a conventional and schematic organization of knowledge such as "buying gasoline." In Mirrors, a common organizing frame is shared by all spaces in the network. In Single-Scopes, the organizing frames of the inputs are different, and the blend inherits only one of those frames. In Double-Scopes, essential frame and identity properties are brought in from both inputs. Double-Scope Blending can resolve clashes between inputs that differ fundamentally in content and topology. This is a powerful source of human creativity. The main types of networks just mentioned are actually prototypes along a continuum that anchors our intuitive everyday notions about meaning to a unified understanding of the unconscious processes at work. Varieties of meaning traditionally considered unequal or even incommensurable –categorizations, analogies, counterfactuals,

metaphors, rituals, logical framing, grammatical constructions– can all be situated on this continuum. Conceptual blending has been shown to operate in the same way at the highest levels of scientific, artistic, and literary thought, and at the supposedly lower levels of elementary understanding and sentence meaning, as we will show in rest of this article.

In crucial respects, the construction of meaning is like the evolution of species. It has coherent principles that operate all the time in an extremely rich mental and cultural world. Partial cross-space mappings, selective projection to the blend, development of emergent structure in the blend are the *constitutive* principles of conceptual integration. Constitutive principles already place strong constraints on the relevant processes, but additional *governing* principles limit their scope much further. They characterize strategies for optimizing emergent structure. Often, satisfying one goes part way toward satisfying another, but governing principles also frequently compete with each other. Governing principles identified to date include:

- Topology: Other things being equal, set up the blend and the inputs so that useful topology in the inputs and their outer-space relations is reflected by inner-space relations in the blend.
- Unpacking: Other things being equal, the blend all by itself should prompt for the reconstruction of the entire network.
- Web: Other things being equal, manipulating the blend as a unit must maintain the web of appropriate connections to the input spaces easily and without additional surveillance or computation.
- Integration: achieve an integrated blend.

More complex integration networks ("multiple blends") allow multiple input spaces, and successive blending in which blends at one level can be inputs at another.

1.3. Range of the cognitive operation

We started to study conceptual blending systematically in 1993, when we discovered the structural uniformity and wide application of the notion. Since then, important work has been done on the theory of

conceptual blending[1], and its empirical manifestations in mathematics[2], social science[3], literature[4], linguistics[5], and music[6]. There have been proposals for the mathematical and computational modeling of the operation[7], and experimental research within neuroscience on the corresponding neural and cognitive processes[8]. Additional information and an extensive bibliography can be found on the blending website[9].

[1] S. COULSON, *Semantic Leaps: Frame-shifting and Conceptual Blending in Meaning Construction*, New York and Cambridge, Cambridge University Press, 2001.

[2] A. ROBERT, "Blending in the interpretation of mathematical proofs", in J.-P. KOENIG (ed.), *Discourse and Cognition*, Stanford, Center for the Study of Language and Information (CSLI) [distributed by Cambridge University Press].

[3] E. SWEETSER, "Blended Spaces and Performativity", *Cognitive Linguistics*, 11 (3/4), 2000, pp. 305-333. M. TURNER, "Backstage Cognition in Reason and Choice", in A. LUPIA, M. MCCUBBINS and S. POPKIN (eds.), *Elements of Reason: The Science of the Mind and the Limits of Political Rationality*, Cambridge, Cambridge University Press. M. TURNER, "Conceptual Blending and Counterfactual Argument in the Social and Behavioral Sciences", in Ph. TETLOCK and A. BELKIN (eds.), *Counterfactual Thought Experiments in World Politics*, Princeton, N.J., Princeton University Press, 1996.

[4] M. FREEMAN, "Grounded spaces: Deictic-self anaphors in the poetry of Emily Dickinson", *Language and Literature*, 6/1, 1997, pp. 7-28. T. OAKLEY, "Conceptual blending, narrative discourse, and rhetoric", *Cognitive Linguistics*, 9, 1998, pp. 321-360. M. TURNER, *The Literary Mind*, Oxford University Press, 1996.

[5] S.K. LIDELL, "Grounded blends, gestures, and conceptual shifts", *Cognitive Linguistics*, 9, 1998. N. MANDELBLIT, *Grammatical Blending: Creative and Schematic Aspects in Sentence Processing and Translation*, Ph.D. dissertation, UC San Diego, 1997.

[6] L. ZBIKOWSKI, "The blossoms of 'Trockne Blumen': Music and text in the early nineteenth century", *Music Analysis*, 18/3, October 1999, pp. 307-345. Manuscript. Lawrence Zbikowski offers a graduate seminar on conceptual mapping and blending in the department of music at the University of Chicago.

[7] J. GOGUEN, "An Introduction to Algebraic Semiotics, with Application to User Interface Design.", in C. NEHANIV (ed.), *Computation for Metaphor, Analogy, and Agents*, A volume in the series "Lecture Notes in Artificial Intelligence", Berlin, Springer-Verlag, 1999, pp. 242-291. T. VEALE, "Pragmatic Forces in Metaphor Use: The Mechanics of Blend Recruitment in Visual Metaphors", in C. NEHANIV, *op. cit.*, pp. 37-51.

[8] S. COULSON, *op. cit.*; R. GRUSH and N. MANDELBLIT, "Blending in language, conceptual structure, and the cerebral cortex", in P. Å. BRANDT, F. GREGERSEN, F. STJERNFELT and M. SKOV (eds.), *Acta Linguistica Hafniensia*, vol. 29, The Roman Jakobson Centennial Symposium: International Journal of Linguistics, Copenhagen, C.A. Reitzel, 1997, pp. 221-237.

[9] Website for Conceptual Blending: http://stanford.blending.edu

1.4. Compression

One of the central benefits of conceptual blending is its ability to provide compressions to human scale of diffuse arrays of events.

We do not establish mental spaces, connections between them, and blended spaces for no reason. We do this because it gives us global insight, human-scale understanding, and new meaning. It makes us both efficient and creative. One of the most important aspects of our efficiency, insight, and creativity is the *compression* achieved through blending. Certain conceptual relations, such as time, space, cause-effect, identity, and change, show up again and again in compression under blending. We call these all-important conceptual relations "vital relations". Compression maximizes and intensifies vital relations. Double-scope blending capacity provides human beings with the ability to do remarkable compressions, and every language provides a systematic array for types of compression. Various highly useful compression patterns become conventional and are associated with specific grammatical forms. In this article, we will consider the general cognitive phenomenon of associating a compression pattern with a linguistic form.

2. Double-scope compression in a two-word nutshell

We can bring two things together mentally in various ways. Blending them is one subset, and blends that satisfy the governing principles are a much smaller subset. The subset below that consists of those core compression patterns that are entrenched in a culture. The next subset down consists of those entrenched compression patterns that have associated grammatical forms.

It is easy to think that a simple form corresponds to a simple meaning. But blending can perform massive compressions and express them in simple forms. So, by virtue of the power of compression and decompression, a simple form can prompt for the construction of an extremely complicated meaning.

Some of the apparently simplest forms in the language consist of putting two words together: noun-noun compounds like "boat house," adjective-noun combinations like "angry man," noun-adjective combinations like "child-safe or "sugar-free" .

Through decompression, we can get quite different complicated integration networks out of words like "dolphin-safe," "shark-safe,"

and "child-safe." In all of these cases, there is successive blending. We first blend the mental space for the current situation –involving dolphins, sharks, or children– with an abstract frame of *danger*. This yields a specific counterfactual mental space in which *dolphin, shark,* or *child* is assigned to a role in the *danger* frame. This mental space of specific harm is disanalogous with the mental space for the current situation. These two disanalogous spaces are inputs to a new blend, in which the disanalogy is compressed into the property *safe*.

"Dolphin-safe," as it currently appears on cans of tuna, means that measures were taken to avoid harming dolphins during the harvesting of the tuna. "Shark-safe," as applied to, say, swimming, refers to conditions under which swimmers are not vulnerable to attack by sharks. "Child-safe," as applied to rooms, means the rooms are free of typical dangers for children. In every case, from simple forms the understander must construct elaborate integration networks.

How one does this mental work may differ from case to case. In "dolphin-safe tuna," the role of the dolphin as potential victim is taken to be useful. In "dolphin-safe diving," said of mine-seeking human divers who are protected by dolphins who are not themselves at risk, the blend uses dolphins in the role of agents of the safety. In "dolphin-safe diving," said of diving that imitates the way dolphins swim and is therefore safe, the blend uses the manner of swimming associated with dolphins. If we assume that dolphins eat goldfish, then "dolphin-safe goldfish" would cast dolphins in the role of predators. Genetic engineers who are concerned not to produce anything resembling a dolphin might refer to a technique that is known never to lead to a dolphin embryo as "dolphin-safe". The dolphin here does not fill the role of victim, victimizer, causal agent, or role model. In a world in which the most humiliating thing for a shark is to resemble a dolphin, behaviors that are unquestionably sharkly might be called "dolphin-safe". And of course, a compositional theory of meaning immune to our dolphin examples would be hailed as "dolphin-safe".

If the adjective "safe" comes before instead of after the noun "dolphin," then we find another multiplicity of potential meanings. "Safe dolphin" can mean a dolphin that is protected, a dolphin that will not inflict the kind of harm other dolphins might cause, the role of swimmer-at-the-front-of-the-school whose responsibility it is to keep the rest of the school safe from running into obstructions, or the decoy dolphin robot which behaves so as to communicate to other

dolphins a situation of complete safety and so lulls them into being caught.

A more specific blending pattern for the compounding of a noun with "safe" arises when the noun refers to an endangered species. Now, we can talk about "turtle-safe nets" or "salamander-safe landscaping" or "hawk-safe agriculture." In order to make appropriate sense of these phrases, one must know the compression pattern chosen by the culture for thinking about endangered species, and also know that it is associated with the Noun-safe form where the Noun picks out an endangered species. Without this knowledge, the meaning cannot be predicted compositionally from the noun and the adjective. What the culture ends up with in this case is a very powerful compression –a maximally simple two-word form that points to an Integrated blend and that satisfies the Unpacking governing principle (i.e. that prompts for the reconstruction of the entire integration network) by evoking mapping schemes and counterfactual spaces that go with "safe." The particular culture that has entrenched this compression has double-scope creativity, a language (English), ecological concerns, food packing corporations, and grocery stores. Double-scope creativity is universal for our species. The language English offers a syntactic noun-adjective form and entrenches certain blend types that go with it, like those prompted for by Noun-safe. The ecological concerns are relatively recent, certainly as applied to dolphins. They make salient and important the scenario of dolphins being harmed by fishing methods, and make it desirable that the scenario be counterfactual. Consequently, the scenario is a good candidate for Noun-safe expression, and a good candidate for marketing departments seeking to induce shoppers to buy their products. This convergence of syntax and commerce creates the compression that appears on cans of tuna fish: "dolphin-safe".

Examples like "dolphin-safe" are useful because they highlight in a transparent and uncontroversial way, the nature of the blending process. Furthermore, they abound. Think of "cruelty-free" on bottles of shampoo, or the variety of noncompositional integration running across "waterproof," "tamper-proof," "foolproof," and "child-proof," or "talent pool," "gene pool," "swimming pool," "football pool," and "betting pool".

Familiar compositions like "dirt-brown," "pencil-thin," "red pencil" and "green house" work in the identical fashion, but because they are very deeply entrenched, it is possible to misinterpret them as

somehow different in their operations from the examples above. Following Charles Travis, we observe that noncompositional conceptual integration is just as necessary in these "core" cases[1]. "Red pencil" can mean a pencil whose wood has been painted red on the outside, a pencil that leaves a red mark (the lead is red, or the chemical in the pencil reacts with the paper to produce red, or . . .), a pencil used to record the activities of the team dressed in red, a pencil smeared with lipstick, not to mention pencils used only for recording deficits. For a set of houses that differ only in location and in the color of the kitchen linoleum, "green house" can mean the house with green linoleum, where "green linoleum" means the one with spots that are green, where "green spots" means spots created with a green pencil, where "green pencil" means . . . .

The scenarios needed for these integrated meanings are no simpler than those needed for "dolphin-safe" and "fool-proof." The cognitive capacities needed to construct these integrated meanings are the same as those needed to interpret the supposedly exotic examples, and these cognitive capacities apply as well to the supposedly central examples like "green house" used to mean a house whose exterior walls, exclusive of windows, shutters, trim, porches, flashing, foundations, and fascia boards, are mostly green on the weather surface. That some interpretations stand out more than others –especially when the phrases are taken in isolation– stems from the existence of strong defaults. This difference has to do with the conceptual and linguistic defaults most likely to be activated in any given situation, not with the mechanisms of integration.

If we look across the central cases like "red pencil" and "government bond," we find that some of the relevant defaults are provided by cultural frames with rich structure, others by generic roles that run across many frames, others by the local situation at the moment of utterance. This last case includes elicitation by linguists and philosophers: the subject is asked to judge an expression in a supposedly context-free way, but in fact must construct a minimal context in which to interpret it. These minimal contexts typically use the strongest defaults.

How do we go from the linguistic units to the conceptual elements or from the conceptual elements to the linguistic units? In

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[1] C. TRAVIS, *The True and the False: The Domain of the Pragmatic*, Amsterdam, John Benjamins, 1981.

the case of nominal compounds, the formal unit names two elements in two different spaces, and directs the understander to find the rest. We will call these conceptual elements the *named elements*. Consider "land yacht" as a reference to a large, luxurious automobile. Clearly, "land" and "yacht" come from different domains: yachts are associated with water as opposed to land. "Land yacht" gives us land from one space and yacht from another, and asks us to perform a mapping between these spaces. In this mapping, yacht corresponds to luxury car, land corresponds to water, driver corresponds to skipper, and the road for the car corresponds to the course for the boat.

Figure 2: *Land yacht*
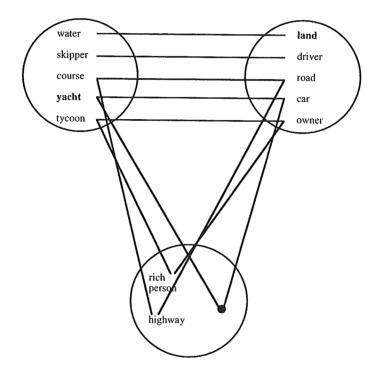
Figure 2 shows how the conceptual blend depends on building an analogical mapping, and how, in the corresponding integrated syntactic form "land yacht", "land" and "yacht" name elements that are not counterparts in the mapping. "Land yacht" now names the new element in the blend, even though it names nothing in either of the inputs, and although *land* is not a counterpart of *yacht*. Formal

expression, in this case a two-word combination, prompts for the construction of the blend and provides a way of naming part of the emergent structure.

Consider "Language is fossil poetry". "Fossil poetry" works just like "land yacht": *fossil* comes from the domain of paleontology and *poetry* from the domain of expression. In the mapping, poetry corresponds to the living organism, while language corresponds to the fossil of that organism. The conceptual elements named in the integrated syntactic form "fossil poetry" are not counterparts in the conceptual mapping.

Now let us look at the kinds of compressions that can be provided by such two-word noun-noun nutshells. Consider "jail bait," a phrase used to refer to an under-age girl whom an adult man finds sexually attractive. "Jail" comes from the domain of human criminality, while "bait" comes from the domain of fishing or trapping. In the mapping between them, attraction to the girl corresponds to attraction to the bait, initiating sex corresponds to swallowing the bait, and ending up in jail (for sex with a minor) corresponds to being caught. The conceptual elements named in the integrated syntactic form "jail bait" are not counterparts in the conceptual mapping. Here, obviously, we are prompted to borrow the compressions and intensities of the fishing frame for the purpose of compressing the "sex with a minor" frame and intensifying many of its vital relations. For example, the causal chain in the "sex with a minor" space, which runs from perception to incarceration, can be long and diffuse, whereas the fishing frame has direct human-scale causation: a single bodily action results in immediately being caught. There is extraordinary emergent structure. In the blend, the man is not to blame. In the space of fishing, the fish does not know that the bait is bait. In the space with the man and the minor, the man certainly does know about laws and jail and he recognizes that sex with the girl is legally forbidden. But in the blend, he is blameless for the action, indeed even the prime victim, even though he understands the law, the prohibition, the possible punishment, and the reasons for it. The "jail-bait" blend may acquire further emergent structure through the principle of Intensification of vital relations. In the fishing space, the intentionality is in the fisherman's attempt to trick the fish and catch it. In the other input ("sex with a minor") the intentionality is in the man's attraction. There is no counterpart for the fisherman in the space with the minor, but it is nevertheless possible to project something

like the fisherman's intentionality into the blend. One corresponding interpretation holds the girl herself responsible for what befalls the man. Another might bring in the Devil. Another might bring in the injustice of society and its laws.

"Jail bait" is an example of a two-word nutshell that prompts for compression through borrowing of the inner-space relationships in the fishing frame. In that compression, Time is scaled down and a diffuse interpersonal interaction with many actions is compressed to a single action –swallowing the bait. This compression can create relations in the blend, such as the attribution of intentionality to the young woman. There is also Highlights Compression –the sequence in the human story of perception, greeting, seduction, doing the deed, having it become known, being arrested and tried and sentenced and jailed is all compressed in the blend into seeing and doing, where, because taking the bait is automatically taking the hook, there is no separation between committing the act and being punished. This is an intense Cause-Effect compression. In the blend, the Effect is literally in the Cause because the hook is literally inside the bait. "Jail bait" is said as *advice:* the compression is meant to focus the man on the Effect by making it part of the Cause, and thus give him powerful Global Insight.

By contrast, there are many cases where it is *outer-space* vital relations between the inputs that are compressed in the blend, as in "caffeine headache," "money problem," and "nicotine fit," where the disanalogy between the inputs is compressed into a property in the blend[1]. For example, money problems are a certain kind of problem, the ones caused by absence of money. Again, we see the simplest possible linguistic form prompting for remarkably complicated integration networks. Communicating through simple grammatical forms is possible because cognitively modern human beings can bring to bear on those forms all of double-scope integration and its governing principles and overarching goals. The language itself does not have to carry such operations as compression or pattern completion because human brains supply those operations at no linguistic cost.

One common aspect of these compounds is that someone attempting to "unpack" the linguistic form does not begin from the

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[1] Cf. G. FAUCONNIER and M. TURNER, "Chapter eleven: the Construction of the Unreal", in *The* Way *We Think, op. cit.,* pp. 217-247.

assumption that the named elements are necessarily conceptual counterparts. When presented with such a linguistic form, we cannot predict, a priori, the relationship between the named elements. Notice that the generic roles of these elements are different in "land yacht," "fossil poetry," and "jail bait". "Land" is a locative, "fossil" is a product of a process, and "jail" is a result. "Yacht" is a means, "poetry" an activity and its product, and "bait" an instrument.

Now consider "boat house." Again the same operations are involved. As in "land yacht," we have a connection between the two different spaces of land and water-houses are associated with land, boats with water. In the mapping between them, the residents of the house correspond to the boats, the house itself corresponds to a protective shelter for storing the boats, and leaving the house corresponds to being launched. "Boat" and "house" name elements that are not counterparts in this mapping.

Of course, there is no restriction that prevents the named elements from being counterparts. Consider "house boat," which again evokes two different spaces of land and water. In the space of land, the resident lives in the house; in the space of water, the sailor is aboard the boat. In the formal integration "boat house," "boat" and "house" *are not* conceptual counterparts; but in "house boat," the boat and the house *are* conceptual counterparts, and they map onto a single element in the blend. Similarly, "jail house" evokes a domain of domestic residence and a domain of criminal punishment. In the mapping between them, the jail and the house are conceptual counterparts, and they map onto a single element in the blend. As Christine Brooke-Rose showed in great detail, NP of NP can name metaphoric counterparts, such as "fire of love"[1]. Charles Fillmore gives the example "One needn't throw out *the baby of personal morality* with *the bathwater of traditional religion*"[2]. These counterparts need not be metaphoric: "the nation of England," "the island of Kopipi", "the feature of decompositionality", "the condition of despair".

In all of these cases, including those in which the syntactic form names elements that are blended conceptually –"house boat" and "jail house"– the blend is both less and more than the composition of the input spaces. In "land yacht", we ignore that yachts have cooking and

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[1]   C. BROOKE-ROSE, *A Grammar of Metaphor*, London, Secker & Warburg, 1958.
[2]   Charles Fillmore, personal communication.

sleeping facilities and require no manufactured course. On the other hand, the blend contains more than the inputs: for example, the inputs may supply the knowledge that we are dealing with a vehicle, but not that it is a car as opposed to something else, or that many specific features that we link with luxury cars belong to the land yacht: electric windows, leather upholstery, opera windows, and suspension built for comfort rather than handling.

In "fossil poetry", on the one hand, we ignore that fossils are typically associated with extinct species, and generally that poetry is not physical or biological. On the other hand, the conception of language as a derivative of poetry is the central inference of the blend but absent from the input space. In "jail bait," we ignore that someone intends to lure the fish while perhaps no one intends to lure the man. We ignore that the man is neither a fish nor (in the case where he merely admires) a criminal. In the blend, we make use of the particular social frame according to which the world is full of pitfalls and traps for the man, teasing him with what it forbids. In the space with the fish, fish are not capable of such a perspective, while in the space of criminal action, the world does not necessarily tempt people to commit crimes.

The situation is no different when the named elements happen to be conceptual counterparts. In "house boat," we ignore that houses have yards and are stationary or that boats are designed principally for travel. We also know many things from background knowledge about house boats that are not derivable from the inputs. We know that a house boat cannot be simply a regular boat put on land that happens to have people living in it, or a regular boat at mooring that someone has been living in; but there is nothing in blending or the use of language to prompt for integration networks that would forbid these meanings.

We see in these examples the falsity of the general view that conceptual structure is "encoded" by the speaker into a linguistic structure, and the linguistic structure is "decoded" by the hearer back into a conceptual structure. An expression provides only sparse and efficient prompts for constructing a conceptual structure.

The problem then is to find the relations between formally integrated linguistic structure on the one hand and conceptually integrated structures built by the speaker or retrieved by the hearer on the other. In general, we will find that the conceptual integration is detailed and intricate, while the formal integration gives only the

briefest indication of a point from which the hearer must begin constructing this conceptual integration.

3. Formal blending

Novel conceptual blends do not generally need novel forms of expression. A language already has all of the grammatical forms it needs to express almost any conceptual blend. For example, all the two-word expressions we have considered in this article use existing syntax: compound forms like Noun-Noun, Adjective-Noun, and Noun-Adjective, as well as particular existing nouns or adjectives filling those forms. The concept *land yacht* may be a new blend, but the phrase uses existing grammar and vocabulary to prompt for the *land yacht* integration network.

Forms are mental elements, and they can be blended just like any mental elements. Sometimes, this blending will align with the blending of conceptual structure to which the forms attach. We can see this pressure to achieve formal organization to express conceptual blending across a range of constructions, from morphemes to sentences. Consider single word integrations like "Chunnel," referring to the tunnel that runs under the English Channel. Clearly, there is a conceptual construction that integrates structure from both the abstract frame of a tunnel and the specific frame of the body of water between England and France. This integrated unit can serve as the site for integrating a great range of knowledge, from the relevant geology to problems of engineering, from the history of relations between England and France to issues of quarantine, disease, and ecology. This integration of content has as a corresponding grammatical form, "the tunnel under the English Channel". This is already tightly integrated. English makes available an even more compact compound noun construction, "the Channel tunnel." By fortuitous accident, a further integration of form is possible, given the phonemes in "Channel" and "tunnel". This integration is a formal blend, triggered by a partial phonological and orthographic mapping between the two words. Pressure to integrate produces (in the case of English) "Chunnel"; the corresponding accidents are lacking in French, leaving as the most integrated form "tunnel sous La Manche." This shows another important aspect of integration: it is opportunistic. That this opportunism depends in any specific case upon apparently peripheral accidents can lead to the mistaken view that the operation is

peripheral. Actually, the most central events and structures can arise exactly by opportunistic exploitation of accidents. Evolution teaches us that this is not paradoxical.

Suzanne Kemmer reports the following example of integration:

> "The Whiners' most common complaint is that they've been relegated to what Mr. Coupland calls 'McJobs.'"

"Mc" evokes a space of fast food and employment in that industry. "Jobs" evokes the more general frame of seeking employment. They have roles in common –workers, employers, wages, benefits, possibilities for advancement, and so on– providing a generic foundation for the blend. Two input spaces are set up, one for aspects of McWorld and another for seeking employment. A straightforward mapping links common roles. But that mapping does not in itself provide the central inference of "McJobs." Specific aspects of the McDonald jobs –no prestige, no chance of advancement, no challenge, no future, boredom, a certain kind of social stigma– are blended with the more general notion of low-level service jobs. Absent this blend, we would be free to associate low-level service jobs with other stereotypes-altruistic and even saintly devotion to others, climbing of the social ladder, small-town serenity and routine, or freedom from avarice and grueling ambition. So this simple blend brings in analogical mapping, the construction of a generic space, and, in the blend, such new categories as the McJob, the type of person who has the McJob, and the pay scale for a McJob. One purpose is to bring inferences from the blend to the conception of crucial realities –such as the plight of young people in the modern economy– and to influence legislation and government policy. The blend's power and efficiency seem to derive from its homogeneous internal structure and its corresponding formal compression into a single word. The striking thing about this unit is that it creates new conceptual structure while all the conceptual engineering that went into building it can be retrieved by a member of the relevant linguistic and cultural community from the single word, "McJobs". We see that the blend satisfies governing principles at the conceptual and formal level: it offers maximal formal and conceptual Compression and Integration and satisfies both Web (i.e. it maintains the web of appropriate connections to the input spaces easily and without

additional surveillance or computation) and Unpacking (i.e. it allows for the reconstruction of the entire integration network).

Formal blending can occur independently of whether there is any background conceptual blending. An ad on the back of a bus for the Del Mar racetrack, whose post time is 2:00 pm, reads: "Hunch hour. 2pm." To get the pun, we must access both "hunch" and "lunch hour" simultaneously. This means doing pattern completion from "hunch hour" to "lunch hour." It means partial mapping of "hunch" to "lunch hour": "hunch" and "lunch" are noun phrases that differ only in their initial phoneme. It means projecting the "unch" of "hunch" and the "unch" of "lunch" both onto the "unch" of "hunch hour"; it means projecting the nominal compound structure (N1 N2) of "lunch hour" onto the corresponding nominal compound structure of "hunch hour". It means projecting the common noun status of the counterparts ("hunch" and "lunch") onto the noun status of "hunch" in the blend.

Suppose one speaker in a group wonders aloud whether the new mall down the road is still open at 9pm, and another speaker responds, "Well, they should be, since everyone knows about *Amahl and the Night Visitors*." Here, "Amahl" in the title of the opera is blended with the noun phrase "a mall," but there is no conceptual blend. Or consider a caption in *Latitude 38* above pictures of the 1994 Vallejo boat race, which had two legs, with the upwind leg particularly sunny: "Vallejo 94 - Two legs, sunny side up"[1]. This caption requires formal blending, partial projection, mapping between forms, pattern completion, and so on, but no conceptual blending: the race is not blended with a particular breakfast dish.

Sometimes, the formal blend parallels the conceptual blend very closely. *The Atlanta Constitution* of 17 February 1994 carried a front-page caption reading, "Out on a Limbaugh", followed by a summary of the story to be found inside: "Critics put the squeeze on Florida's citrus industry for its $1 million deal with broadcaster Rush Limbaugh". To get the punning effect of "Out on a Limbaugh" requires accessing "out on a limb" and "Limbaugh" simultaneously. Behind this formal blend is a conceptual blend with two input spaces, one with an agent who climbs out on a limb of a tree, another with the deal between the Florida citrus industry and Rush Limbaugh. Just as *limb* and *Limbaugh* are blended conceptually, so "limb" and "Limbaugh" are blended formally. In this particular unusual case,

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[1] *Latitude 38*, June 1994, vol. 204, pp. 116-117.

conceptual counterparts that are conceptually blended have formal expressions that are formally blended. Even more, the formally blended element in fact refers to the conceptually blended element. The formal blend, as is standard for a blend, contains formal structure that is not calculable from the formal inputs. Let us look at these formal inputs. "Out on a limb" has an indefinite article with a common noun. "Limbaugh" is a proper surname. While a proper surname in English can become a common noun indicating one of a group of people with that surname ("She's a Kennedy", "She's the poorest Kennedy") or one of a group of people analogically equivalent to a particular person ("He's an Einstein"), this is not what is going on here. Nor is "a Limbaugh" a case of an indefinite article used with a proper noun referring to an unknown person who happens to have that label, as in "There is a Fidelia Cumquat on the telephone for you". In "Out on a Limbaugh," "Limbaugh" has not become a common noun, referring to namesakes or analogs of Limbaugh, nor is it picking out an unknown person. On the contrary, it is picking out an extremely well-known particular person. Nonetheless "Limbaugh" follows an indefinite article; this is a property of its counterpart "limb" in the other input to the blend. As a result the formal blend has new syntactico-semantic structure, that is, indefinite article + proper name associated with a known person.

In the Limbaugh example, we see formal blending and conceptual blending in close parallel, but this mirroring is very rare. We have already seen cases of formal blending that have no corresponding blend at the conceptual level. Conversely, most conceptual blending happens with no corresponding formal blend. For example, "Look before you leap" is a standard prompt for metaphorical blends that has no formal blending. There are even cases where conceptual blending and formal blending are both at work, but the formal blend runs contrary to the conceptual blend. For example, contestants on the BBC game show "My Word" were challenged to come up with an intelligible expression identical to the title of any popular show song except for a single letter in the last word, for example, "When you wore a pink carnation / and I wore a big red nose". One contestant's response was "Why can't a woman / be more like a mat?" (The original, from *My Fair Lady*, is "Why can't a woman / be more like a man?") At the formal level, "man" and "mat" are blended, but at the conceptual level, *man* is to be blended not with *mat* but with its opposing element: *person who walks on the mat*.

4. Complex grammatical structures

We have already seen in some detail how many grammatical constructions work:

—single words like "safe,"
—nominal compounds like "boat house," "house boat," and "jail bait,"
—adjective-noun compounds like "guilty pleasures," "likely candidate," and "red ball,"
—Morphological combinations in a single word like "Chunnel."

In all these cases we saw that the construction in the language had a stable syntactic pattern that prompts for a specific blending scheme. The blending scheme carries with it a particular kind of compression.

A language is a powerful culturally developed means of creating and transmitting blending schemes. The capacity for language depends intricately on the capacity for blending and compression[1]. The patterns we find in a language are the surface manifestation of blending schemes that have emerged within a culture and that have wide applicability. Over the last fifty thousand years, cultures have developed many systems for saving people from the work of inventing all the useful blending schemes from scratch. The most obvious and perhaps the most powerful way cultures provide children with useful blending schemes is through language.

In linguistics, the forms in language have been studied under the term "syntax". It turns out that, however one looks at them, these language forms are exceptionally complex, much more so than we ever realize. So, notoriously, the study of syntax is also complex. Yet that study is essentially incomplete if we do not simultaneously study the blending schemes for which these language forms prompt. Even when the language forms are simple —as in "jail bait"— the corresponding integration networks can be very complicated.

We will now look in some detail at more elaborate constructions that are central on anybody's account and analyze the central role of blending. This will give an idea of the general inseparability of language, blending, and compression. Language has elaborate formal

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[1] Cf. G. FAUCONNIER and M. TURNER, "Chapter nine: the Origin of Language", in *The Way We Think, op. cit.*, pp. 171-193.

patterns because it prompts for powerful blending schemes. But the formal patterns and blending schemes are so deeply entrenched as to be almost invisible to consciousness.

4.1. Caused motion

One of the most common and familiar human scenes is moving an object –we throw it, kick it, hurl it, or nudge it, and it moves in a direction and lands somewhere. This is the "caused motion" scene. It contains an agent who does something, and that act causes an object to move. There are verbs whose entire job is to indicate some specific version of the caused motion scene, like "throw," "hurl," and "toss." Many, perhaps all languages have such verbs and a pattern into which they fit. In English, that pattern is Subject-Verb-Object-Place, as in "*Jack threw the ball over the fence*". But in English, unlike most languages, this pattern can also be used with verbs that in themselves do not express caused motion, verbs like "walk," "sneeze," and "point". So we get, "I walked him into the room," "He sneezed the napkin off the table," and "I pointed him toward the door". This pattern can even accommodate verbs that involve no physical motion at all –verbs like "tease," "talk," and "read". So we get, "They teased him out of his senses," "I will talk you through the procedure," and "I read him to sleep". In these examples, the subject performs some action and this causes the object to "move" either literally or metaphorically, in a "direction" either literal or metaphoric. The caused-motion construction has been studied in great detail by Adele Goldberg[1].

In all of these cases, the form is prompting for an integration network that has the caused motion scene as one input and some other diffuse scene (involving walking, or throwing, or sneezing, or talking, or reading, and so on) as the other input. In the case of "He sneezed the napkin off the table," the diffuse input consists of a sequence of events in which there is a person, a napkin, and a table, the person sneezes, the sneeze moves the ambient air, the air stream impacts the napkin, the napkin because it is light, moves under pressure from the air stream, and typically reaches the edge of the table where gravity causes it to move in a quasi-parabolic path (except for air resistance)

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[1] A. GOLDBERG, *Constructions: A Construction Grammar Approach to Argument Structure*, Chicago, University of Chicago Press, 1994.

to land on the floor, which it cannot penetrate, because, after all, it is only a napkin. In the diffuse input, we have an action, sneezing, with an agent and a motion by an object, the napkin, in a direction. The action is causally related to the motion. In the compressed caused-motion input, we have an agent, an action-motion, an object, and a direction. Conceptually, there is a natural mapping from the caused-motion scene to the diffuse input: the agent maps to the agent, the object to the object, the direction to the direction, and the action-motion to any of a number of distributed candidates –the action, the causal relation, or the motion.

In the compressed input, there is a syntactic form associated with the conceptual compression. In the diffuse input, particular words like "sneeze" and "napkin" and "off" and "table" are associated with individual events and elements. In the full integration network, the conceptual compression and the syntactic form come from the compressed input, while some individual words come from the diffuse input through selective projection. In the case of "He sneezed the napkin off the table," we integrate the conceptual structure of the caused-motion scene with many elements and events from the diffuse input: the agent, the action, the causation, the object, the motion, and the direction. The single action-motion in the caused-motion input maps to at least three different elements –the action, the causal link, and the motion in the diffuse input. We also integrate the caused-motion syntax (Subject-Verb-Object-Place) with a few of the words available for the diffuse input, in this case a word for the agent ("he"), a word for the action ("sneeze"), and some words for the object and the direction.

But notice that we do not bring in a word for the causal link from the diffuse input, or a word for the motion of the object. Because the mapping from the action-motion to the diffuse input is not one-to-one, we have many possibilities for projecting words from the diffuse input. We might project a word for the causal link rather than the action or the motion, as in "Sarge let the tanks into the compound". This example typically evokes a military situation in which Sarge's permission is needed for the tanks to enter the compound. The sentence does not specify the particular causal action performed by Sarge (waving his hand, signing a paper, giving a verbal OK by telephone) or the motion of the tanks (being carried in on trucks, airlifted by helicopters, moving on their own power). We might project a word for the motion of the object, as in "He rolled the barrels

into the warehouse," where it is the barrel that rolls, not the agent. The sentence does not specify the particular casual action (pushing the barrels, kicking them down a ramp, pressing a button to release the queue of barrels...), nor does it specify a causal link. In fact, the single integrated action-motion in the caused-motion input includes manner of both action and motion, as we see in specifically caused-motion verbs like "throw," "push," and "hurl," which indicate something about both the manner of the action and the manner of the motion of the object. So the single action-motion connects to the manner of the action and the manner of the motion in the diffuse input as well, and we can project words for those manners into the blend, as in "He floated the boat to me" and "He wiggled the nail out of the hole". The scenes evoked by these examples include action, motion, and manner, but the words that are projected, "floating" and "wiggling" do not themselves require motion along a path or external action. They focus on the manner of being.

Such constructions offer ready-made and powerful blending schemes. A tightly compressed frame and a corresponding syntactic form from one input can be recruited into a blended space linked to a diffuse input. Constructing a network based on that scheme for a particular case depends crucially on being able to construct a generic space that applies to the two inputs. In the case of the caused motion examples we have seen, this generic space has agent-action, object-motion, and direction. This description also fits the very striking example, "They prayed the two boys home". Here the blend is performing an extreme compression: the scene with the prayer and the boys contains many causal steps over an expanse of time, and intermediate agents, with relatively weak or vague causality, but in the blend there is a single action that is directly causal for the boys' coming home.

As we have seen many times in this book, metaphoric mappings provide one of the standard ways of locating a cross-space mapping between inputs and constructing an integration network. If the diffuse input has causation of change of states, then there is already an existing template for blending states and locations and changes of states with changes of locations, and that template can be recruited wholesale to provide much of the cross-space mapping and much of the projection to the blend. For example, "I pulled him out of his depression" prompts for a network where one input is the caused motion scene with its syntax, and the other input has a complicated

interpersonal causation involving a change of psychological state. We automatically construct much of this particular caused-motion integration network by recruiting the states-locations blending network. "Pull" is a prototypical caused-motion verb, but the analysis works identically for "I talked him out of his depression" or "He drank himself into oblivion".

We have seen cases where the cross-space mapping is a bundle of Role-value mappings in a Simplex network (as in "He threw the ball over the fence," where *throw* is a value for the role *causal action-motion*) and cases where the cross-space mapping is analogical or metaphorical ("He drank himself into oblivion"). The caused-motion network also operates in the interesting ways when there are counterfactual connections. Adele Goldberg offers the example "Pat blocked Chris out of the room"; others include "We barred him from the building," "John forbade him from participating," and with the metaphorical connection, "We kept him out of trouble." Such examples show that the compressed input is more general than just caused-motion. The more general frame is that of an agent exerting a force and of an object undergoing a force in the direction of a goal. In the simple case, the agent exerts force on the object in the direction of the goal, as in "we moved the wolf to the door." In this case, "move," indicates the application of a force by the agent; "to" indicates that the force is in the direction of the goal; and "door" indicates the goal. But alternatively, the force exerted by the agent can oppose the movement of the object, as in "we kept the wolf from the door". Here, the verb "keep" indicates that a certain force is applied in opposition to an existing force; "from" indicates that this applied force is in the direction away from the goal; and "door" indicates the goal.

We see then that the general compressed input in a "caused-motion" network is force-dynamic and applies equally well to the caused-motion and blocked-motion examples. The blocked-motion examples have an implicit counterfactual space: "keep" implies that the agent's force opposes the object's force, so if the agent's force disappears, the object moves to the goal.

4.2. Emergent syntax

In the caused-motion construction, the syntactic component comes entirely from the compressed input space of integrated caused motion, while words come from the space of the events associated

with the causal sequence. But there are other constructions in which the syntactic form used for the blend does not come entirely from one space. Part of it comes from one space, part of it from the other, and part of it develops specifically for the blend. In this case, the blend has emergent syntax relative to the inputs. Consider causatives in French, which are formed using the verb *faire* ("do").

NP	V	V	NP
[Pierre	fait	manger	Paul.
[Pierre	makes	eat	Paul]

(meaning "Pierre feeds Paul")
[Paul is the agent of "manger"]

Pierre	fait	envoyer	le paquet.
NP	V	V	NP
[Pierre	makes	send	the package]

(meaning "Pierre has the package sent")
["le paquet" is the object of "envoyer"]

Pierre fait		manger	la soupe	à Paul.
NP	V	V		NP	à NP
[Pierre		makes	eat	the soup	to Paul]

(meanig "Pierre feeds Paul the soup)
[Paul is the agent of "manger", "la soupe" is the object]

By these double-verb forms, French provides its speakers a way to evoke an integration network that delivers a compressed, human-scale scene in which at least two agents (Pierre and Paul), a causal action, a causal link, and a caused action (eat) are integrated into one event. Now, the French language already has single-verb forms that are good for parts of this integration. For example, "Jean fait le pain" is fine for evoking a scene in which Jean performs a causal action involving another element (le pain). And "Paul mange la soupe" is fine for evoking a scene in which Paul performs some action on another element (la soupe). French has several basic single-verb clausal constructions. How shall we express the scene in which Pierre does something that causes Paul to eat the soup? None of the basic single-verb clausal constructions quite serves. French offers three complex blends for doing the job[1]. Each has as one input one of three compressed basic single-verb clausal constructions, and as the other input the diffuse chain of causal events with intermediate agents that we want to compress. The blend takes much of its clausal syntax from

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[1] G. FAUCONNIER and M. TURNER, "Blending as a Central Process of Grammar", *op. cit.*

the compressed first input, but, and this is crucial, it has additional, emergent syntax. In that syntax there are now two verbs. Additionally, there are novel positions for clitic pronouns (like *le, lui,* and *se,* as in "Paul *se* fait tuer par Jean" versus "Paul fait *se* tuer Jean") and various complements (as in "Paul fait envoyer le paquet à Marie à Jean," meaning "Paul has the packet sent by Jean to Marie"). In these double-verb causatives we see double-scope integrations at the conceptual level: the conceptual frame for the basic construction does not match in a one-to-one fashion the complex and diffuse causal chain in the other input. We also see double-scope integrations at the formal level, delivering new, emergent syntactic forms for expressing the blend. In the caused-motion construction, the syntactic form came entirely from the compressed input. Here, in the double-verb causatives, the syntactic form comes only partly from the compressed input. Some words and their grammatical categories come from the other, diffuse input. And the full syntactic form is emergent in the blend.

The double-verb causative constructions may be a response to an integration problem faced by humans everywhere: one person does something that is causal for someone else's action. A blending template achieves appropriate compressions in these instances, and language forms can prompt for these compressions. Many languages have arrived independently at the solution of double-verb causative constructions, using blends like the ones in French but having different emergent syntax. The development of these language forms is an example of the way in which human cultures, using the cognitively modern capacity for double-scope integration, evolve blending templates, including language forms, that are transmitted to subsequent generations. Elsewhere[1], our principal argument was that language could not be developed as an efficient set of forms without the capacity for double-scope integration. Here we make that point more explicit by highlighting the crucial role of blending in a few particular constructions. Languages, with their grammars, are great cultural achievements produced and perpetually transformed through the exploitation of the capacity for double-scope integration.

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[1] Cf. G. FAUCONNIER and M. TURNER, "Chapter nine: the Origin of Language", in *The Way We Think, op. cit.,* pp. 171-193.

5. Cultural evolution of language

Language changes over centuries. Latin gave rise to French. It is in fact a remarkable universal feature of all languages that they change over cultural time. For the most part, deep changes in the structure of a language take so long that we do not see them happening in a single lifetime, although we sometimes see lesser changes taking place in the space of a few years, as when new words come into the language, slang and idioms are created, or existing words acquire new extensions, such as "virus" for the nefarious program that ruins your computer. Linguists agree that this change is not a matter of either improvement or deterioration of a language. Languages do not change because they are deficient or unstable. Perfectly fine systems in a language routinely evolve into different perfectly fine systems. Why should this be? In most grammatical theories, powerful principles have to be invoked.

We suggest that the central role of conceptual blending, compression, and double-scope creativity in grammar and grammatical constructions induces language change very naturally and, in fact, unavoidably. One reason for this is the natural emergence of new syntax under pressure from borrowed compressions, as we saw in the case of the French double-verb causatives. Another reason for progressive change in languages is that conceptual blending networks are underspecified. Because such networks prompt for mapping schemes without specifying the mappings and projections exhaustively, grammatical constructions leave users, singly and collectively, some leeway in the actual implementation of the mapping schemes. This kind of language change stems from variation of the underspecified aspects of the selective projections and mappings within the network. Suzanne Kemmer and Michael Israel have shown conclusively, in their extensive studies of the "way" construction, that within a relatively stable blending scheme over several centuries, usage during a certain period will emphasize certain projection patterns and not others, and that this usage will change over time[1].

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[1] See S. KEMMER and M. ISRAEL, "Variation and the Usage-Based Model", in K. BEALS et al. (eds), *Papers from the Parasession on Variation and Linguistic Theory*, Chicago, Chicago Linguistic Society, 1994; M. ISRAEL, "The *Way*

Modern examples of the "way" construction are "He found his way to the market," "He made his way home," "He elbowed his way through the crowd," "He jogged his way along the road," "He talked his way into the job," and "He whistled his way through the graveyard". This usage developed from a Middle English *go-your-path* construction, which accepted almost any noun that meant something like "way," as in "He lape one horse and passit his way" (1375) and "Tho wente he his strete, tho flewe I doun" (1481). Later, a new syntax developed that allowed for a complement indicating direction, as in "He went his way home". The construction developed by allowing ever more kinds of verbs indicating something about the manner of the movement. As Israel remarks, these verbs "tend to cluster around certain well-defined semantic prototypes." Between 1826 and 1875, a large number of verbs coding difficult motion or tortuous paths become acceptable. They include *plod, totter, shamble, grope, flounder, fumble, wend, wind, thread, corkscrew, and serpentine*. Dickens writes in 1837: "Mr. Bantam corkscrewed his way through the crowd". It is not until the end of the nineteenth century that we begin to find verbs like *crunch, crush, sing, toot* and *pipe* in the construction. Israel explains that they encode "not motion per se, but rather the noise that inevitably accompanies certain forms of motion". A different development of the construction, the means thread, comes up fairly late at the end of the sixteenth century. In this thread, verbs for creating a path become acceptable, as in "Arminius paved his way" (1647). A familiar example would be "Every step that he takes he must battle his way" (1794). Israel writes, "By 1875, examples include uses with *push, struggle, jostle, elbow, shoulder, knee, beat* and *shoot*. In the nineteenth century, as the manner thread experiences a rapid expansion, the means thread begins to allow verbs encoding increasingly indirect ways of reaching a goal," as in "Not one man in five hundred could have spelled his way through a psalm" or "He smirked his way to a pedagogal desk". The role of blending is crucial:

> It is useful, in this light, to consider the construction . . . as an example of a syntactic blend—that is, as a specialized grammatical pattern serving to combine disparate conceptual

Constructions Grow", in A. GOLDBERG (ed.), *Conceptual Structure, Discourse and Language*, Stanford, Center for the Study of Language and Information, 1996, pp. 217-230.

contents in a single, compact linguistic form. Essentially, the modern construction provides a way to blend the conceptual content of an activity verb with the basic idea of motion along a path. The trend toward verbs coding activities which are increasingly marginal to the achievement of motion thus reflects the construction's gradually increasing power to blend different types of events into a single conceptual package[1].

Israel has succeeded in showing that some underspecified projection patterns for the integration network associated with the "way" construction were extended over time. He also shows that another underspecified projection pattern for the construction diminished over time: "The third thread . . . involved usages with verbs like *keep, hold, take, snatch,* and *find* for coding the acquisition or maintenance of possession of a path. These usages were very common in early stages of the construction. But unlike the other two threads, this usage shrank rather than expanded over time, so that now only *find* . . . and a few other verbs remain to represent it"[2].

6. Conclusion

All along, we have stressed creativity and novelty as consequences of conceptual integration. But creativity and novelty depend on a background of firmly anchored and mastered mental structures. Human culture and human thought are fundamentally conservative. They work from the mental constructs and material objects that are already available. Conceptual integration too has strong conservative aspects: it often uses input spaces, blending templates, and generic spaces that are anchored in existing conceptual structure; it also has governing principles driving blends in the direction of familiar, human scale structures; and it readily anchors itself on existing material objects. Emergent structure –both conceptual and formal– can arise through conceptual integration within basically conservative integration networks.

This general pattern of development in culture and thought has the evolution of grammar as a special case. We have seen sample evidence of the central role of blending and compression both in superficially simple constructions like Noun-Noun and in those that

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[1] *Ibid.,* p. 226.
[2] *Ibid.,* p. 221.

are acknowledged as highly complex, like French double-verb causatives. Advanced conceptual integration operates simultaneously for both conceptual and formal structure. It requires double-scope capacity, and by its very nature promotes both continuity and change at the conceptual and formal levels. Indeed, for conceptual blending to happen at all, continuity is essential. We have shown how novel constructions or variants of constructions draw –thanks to conceptual integration– on deeply entrenched constructions, conceptualizations, and blending templates. But because blending involves selective projection, composition, completion, and elaboration under a set of governing principles, it can produce new, well-anchored conceptual and formal structures. In his article on "way" constructions, Israel points to just these features of simultaneous conservativism and novelty. He writes, "Utterances should sound like things the speaker has heard before". There are also, he notes, forces for innovation. The world is rich, both physically and culturally, and it evolves, and this places pressures on us to create new conceptions and expressions. We do this through double-scope integration, but the products are not wholly novel. Constitutive and governing principles ensure that the network is in many ways deeply familiar, not the least in using familiar frames, a canonical set of vital relations, an easily accessible initial cross-space mapping, and human-scale organization and compression in the blended space. For grammar, this delivers slightly new expressions that, however novel, are intelligible precisely because they are for the most part strongly anchored to existing constructions. When we hear an expression, we try to construct an integration network, but to do so we have to do some selective projection, composition, completion, and elaboration that is not specified by what we hear, so there is yet more room for creativity and novelty. We do as much blending as we need to do to make sense of the utterance, and this work is simultaneously conservative and innovative.

As we have argued in some detail in this article, blending turns out to be a central feature of grammar. Far from being an independently specified set of forms, grammar is an aspect of conceptual structure and its evolution.