

HOW UNIVERSAL MENTAL OPERATIONS THAT ARE NOT SPECIFIC TO LANGUAGE CREATE HIGHLY DIVERSE LINGUISTIC AND CULTURAL SYSTEMS OF COMMUNICATION¹

The first rule of cognitive linguistics is to hunt for origins of linguistic powers in robust mental operations not specific to language. For millennia, language science has assumed that human beings possess mental operations for unifying, combining, and merging patterns to create expressions. In the reverse cognitive direction, human beings can analyze expressions produced by other human beings, to recognize patterns that were combined to produce those expressions. This article, in its third section, reviews some of the literature on this topic. Any such assumption about a linguistic power takes out a loan on theory that needs to be cashed out, if the theory is to be *cognitive*. To cash out such assumptions is to locate and model the non-language-specific cognitive operations that make the linguistic powers possible. This article proposes, in its first section, that the non-language-specific mental operation that accounts for these linguistic powers is *blending*, otherwise known as *conceptual integration*. In its second section, this article provides a topical review of blending in specific communicative form-meaning pairs and their combination. Blending is the foundation of creativity in communication, or more specifically, in the creation and combining of form-meaning pairs, often called “constructions.”

Key words: *construction grammar, cognitive linguistics, conceptual integration, blending.*

Blending

Research on *blending* per se and by that name began in 1992. The first presentation occurred in 1993 and the first technical report appeared in 1994 [1]. A quarter-century after that first technical report, several million words at least have been published on blending, in nearly every field that studies human affairs: art, music, religion, law, decision-making, mathematical insight, scientific discovery, AI, dance, fashion, advanced tool use, advanced social cognition, creativity in all fields, and so on. Blending has been the core subject of several major longitudinal scientific grants in various fields in North America, South America, Europe, and Asia. Linguists are asked to focus on the fact that most publications on blending do not treat language at all. An attempt has been made to list major publications at <http://blending.stanford.edu>, but the field is much too large to survey. For an overview, see especially [2] and, secondarily, in chronological order [3; 4; 5; 6; 7; 8; 9].

Principal findings of blending theory include the following:

1. While rudimentary blending seems to be available to several species, cognitively modern human beings are a step up the cline. Human command of advanced blending is indispensable to human creativity. The small extra step up the cline makes a vast difference in ability and products.

2. For cognitively modern human beings, blending is not at all costly. On the contrary, it is a constant and almost entirely invisible operation. The cognitively

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modern human mind is built to attempt to blend when possible. Blending is opportunistic. Nearly all blending attempts fail almost immediately by failing to meet the constitutive requirements of building a blending network. The relatively small number of attempts that survive rarely attach to a purpose or survive optimality constraints on blending. Few of those actually penetrate to action (such as expression). Few of those ever enter into consciousness. Very few of those achieve uptake by the community. Very few of those become entrenched for a community or a culture.

3. Blending is not a mental pattern with a fixed template or sequence but rather a principled mental *operation* that can run across any cognitive network that a human being is activating. Very many different kinds of blending products have been studied. There are some standard generic patterns of blending that arise repeatedly, but they are only standouts in the general landscape.

4. Blending work can be done anywhere in the blending network at any instant in the construction of the network, including in developing various spaces and developing vital conceptual relations between them.

5. Blending networks recruit from stable structures and can themselves become stable, widely-shared, and entrenched.

6. Blending networks create emergent structure not only in the blended space but throughout the network.

7. Blending plays a crucial role in everything we tend to view as distinctly human, and no analysis of higher capacities will be adequate if it leaves blending out of account. A theory of art, mathematics, science, religion, spirituality, learning, phylogenetics, human neurobiology, cultural evolution, etc. that leaves blending out of account is fundamentally flawed. But in the great scheme of things, the role of blending is still *very small*. Socially, and consciously, we are often aware of blending phenomena, which we use for social distinctions, technological advances, aesthetic experience, spirituality, and so on. Accordingly, we notice blending in some cases. But billions of years preceded the relatively recent evolution of advanced blending, and elaborate social and demographic work is needed to exploit the capacity fully. It is easy to make the mistake of discounting the vast run-up to advanced blending by falling for the “Last is Everything” fallacy.

8. Although advanced blending comes last in this evolution of mental operations, it is not a linear addition but on the contrary changes the way we deploy all those other mental operations.

9. In the great scheme of things, blending is just one of very many important mental operations. Blending research is not a reductionist program. There is no attempt to argue that everything is a variety of blending, or that a particular mental or social achievement is explained by blending “tout court.”

Examples used to give an elementary taste of blending need to be recognizable as blends, if the examples are to be pedagogically effective, and so are typically pyrotechnic. Such pyrotechnic examples are useful, but insidious,

because their pyrotechnical nature misleads students into assuming that blending is a special, pyrotechnic, unusual, and visible operation instead of what it is: the basic harmony of the way we think. Blending is almost entirely invisible at first glance.

A chestnut example where the blending is visible is “the riddle of the Buddhist Monk.” A Buddhist monk in the pre-dawn light, standing for a while at the foot of a mountain path that leads to the summit, decides to climb the path. He begins at dawn walking up the mountain, reaches the top at sunset, meditates at the top overnight until, at dawn, he begins to walk back to the foot of the mountain, which he reaches at sunset. Make no assumptions about his starting or stopping or about his pace during the trips. Riddle: is there a place on the path which the monk occupies at the same hour of the day on the two separate journeys?”

Many people, including trained mathematicians, fail to see the answer quickly or at all. But separate the action into two mental spaces, one with the monk ascending and one with the monk descending, both from dawn to dusk, and then blend them. Think of two videos being superimposed. In the blend, there are two monks, one at the foot of the path and one at the top, and they begin traversing the path at dawn and finish traversing the path at sunset. We complete the blend with the knowledge that two people who traverse a path in the same time interval in opposite directions must, so long as they stay on the path, meet. Given the way the blend is assembled, the place the monk occupies at the same hour of the day on the two separate journeys is the spot where “the monk” “meets” “himself” in the blend. There is selective projection to the blend (calendrical dates are not projected to the blend, nor is the intentional state of someone who actually encounters himself, etc.) and there is emergent structure in the blend (two monks, a meeting). The paths, dawns, and dusks are fused. There are many complexities to how the blend is assembled. Some of them are reviewed in [10], which includes three mathematical proofs, all of them launched by blending of standard types deployed in mathematics, as reviewed in [11; 12].

A blend is a “mental space” in a conceptual network of potentially many such mental spaces, in a potentially highly dynamic network, and helps to manage that conceptual network, including its construction and dynamism. A slightly less pyrotechnic chestnut example of blending is the “miserable Bay Area stockbroker”: Consider Bill and Peter, brothers-in-law, each happy. Bill is a mathematically-talented professor in the Eastern time zone who likes both investing and San Francisco. Peter is a stockbroker in San Francisco. Bill, in the East, wonders, analogically, should he move to San Francisco and be a stockbroker and get a huge raise? No: Bill is a night owl but Peter must arise at 5:30am Pacific Time to pull himself together for an hour to then deal with the stock market’s opening at 9:30am Eastern Time. Peter likes the morning but Bill hates it. Mentally, Bill has created a new, blended person – Bill-as-Peter, who is miserable. Everyone is happy in the inputs but the central structure of the conceptual network is the miserable stockbroker in the blend. That misery is emergent structure. The

selectivity of the projection is crucial. The stockbroker in the blend is not married to his sister, even though the person in the blend is a stockbroker married to the woman who is in fact the sister of the stockbroker in the inputs.

A shockingly creative example which at first almost nobody takes as involving blending is the chestnut case of the cyclic day [9]. In our experience, there is actually just one day and then another day and then another day and then another day, in a sequence that stretches out indefinitely, forward and backward. The days in that sequence are all quite different. They do not repeat. If we woke up today and it was exactly the same as yesterday because it was in fact the same day in every detail, we would be sure we had lost our minds. And then it would not even be the same day, because yesterday we did not think we had lost our minds. Day after day after day indefinitely, with all those differences between days, is too much to comprehend, too much to fit inside working memory, too much to carry around and manage. It is not mentally portable. So we blend these different days into a conception of a cyclic *day*. We do this by using a very common general blending template. There are analogies and disanalogies across the different days in our experience. The analogies are packed into one thing in the blend: the *day*. The disanalogies are packed into change for that thing: The day is *cyclic*; it *starts over* every dawn and *repeats*. No one of the individual input days to the cyclic day blend is cyclic; no one of those individual input days repeats or starts over. But because of blending, all the days that have ever happened or will happen can be packed into a single idea, a tight, tractable, manageable, human-scale idea – the cyclic *day*, which *repeats*. Thinking of the cyclic day, we can say, “dawn is coming around *again*,” or “It’s time for my *morning* coffee” or “this park closes *at dusk*.” We know how these words and concepts apply to the compact blend, and we can unpack from that blend to any parts of the mental web that interest us, to any day at any time, and even to a tractable stretch of days. The cyclic day is a compact touchstone, a congenial blend for thinking about the vast sequence of days. This vast sequence of days is of course itself too big for working memory. The compact blend – the single *cyclic day*, a new idea – makes it possible for us to work with concepts of time that stretch far beyond what we would otherwise be able to manage.

The riddle of the Buddhist Monk is not solved by abstracting what is common to the ascent and the descent. The miserable stockbroker is not imagined by abstracting what is common to the two brothers-in-law. The cyclic day is not conceived by abstracting what is common to every day (none of which repeats). The dinosaurs-to-birds story is not understood by abstracting what is common to dinosaurs and birds. Blending includes abstraction but goes very far beyond it. Blending is very complicated. For further analysis, see [2] and the many introductory reviews cited above.

Blending at work in specific communicative patterns

To know a language is to know a relational network of form-meaning pairs and how they blend to produce expressions. Form-meaning pairs are often referred

to as “constructions.” An actual, specific communicative act that results from combining form-meaning pairs into a performance is often referred to as a “construct.”

Language science needs a theory of creativity to account for:

- 1) relatively quick (fewer than thousands of years), non-species-wide creation of a form-meaning pair, at any point in human descent;
- 2) the blending of form-meaning pairs to create expressions, or more generally, communicative performances (“constructs”);
- 3) the creation of novel form-meaning pairs, using established ones as inputs, whether or not these new form-meaning pairs become entrenched to some degree;
- 4) the phylogenetic origin of language;
- 5) the ontogenetic acquisition of language.

The remainder of this section gives some examples of constructions that have received blending analyses.

Conditionals

Linguistic expressions for building “possibility” mental spaces [13] “If I were a stockbroker, like my brother-in-law” – are routinely used to prompt for blending networks, as analyzed at length in [2] and [14]. *If-then* conditional constructions are one of the most obvious aspects of grammar used to prompt for blending, but there are many others, e.g. “I could be a stockbroker.”

Change Predicates

We saw in the example of the *cyclic day* the use of a generic template according to which vital relations of analogy and disanalogy across mental spaces in a mental web are compressed in the blend to provide a human-scale concept. The analogical connections between input spaces are compressed to an identity or unity in the blend, and the disanalogical connections are compressed to change for that element in the blend. Naturally, grammar for expressing change becomes available to the blend. We say that “dinosaurs turned into birds” and expect the hearer not to think we mean that some dinosaurs actually turned into birds; rather, we expect the hearer to understand that the change for “dinosaurs” in the blend unpacks to vital relations of analogy and disanalogy across the inputs. In the blend, there is an identity, a group identity, consisting of *dinosaurs*, and this identity “changes” into a different group identity, *birds* [2]. Such change predicates have been widely analyzed in the literature [15].

The Ground and Blended Grounds

Deictics and, more broadly, indexicals – such as *I*, *you*, *here*, and *now* – are form-meaning pairs tied to elements in the conceptual frame of *the ground* [16, p. 13]. Their utility depends on our ability to do what G. Fauconnier and M. Turner refer to as “simplex blending” [2]. A simplex blend is one in which one input mental space is an established conceptual frame and the other input spaces contain elements of just the sort to which the conceptual frame is expected to apply. For example, if one mental space has the kinship frame *father-child*, and

another mental space has two people, *Paul* and *Mary*, then the blended space can blend *Paul* with *father* and *Mary* with *child*, and we can prompt for this blend by saying “Paul is Mary’s father”.

Viewpoint

Viewpoint arises inevitably from embodiment: participants in any scene of communicative joint attention are embodied, and blending projects selectively from viewpoint in the input mental spaces to the blend [17].

F. Recanati analyzes the way in which what he calls “the epistolary present” expresses a blended temporal viewpoint belonging to the blended joint attention that arises for personal correspondence [18]. In the blend, writer and reader are present in the moment and jointly attending, although they know that outside the blend in the mental web organized by the blend they are in different times and conditions. M. Turner [3] analyzes other temporal viewpoint blends, as when the wife, headed to the shower, says to her husband (who has asked how a certain task will be accomplished), “My husband took care of that while I was in the shower”.

K. Nikiforidou [19; 20] analyzes the role of blending in a construction she calls “Past tense + proximal deictic”, with emphasis on the cases where the proximal deictic is “now.” The preferred patterns are “was/were + now,” as in “*It was now possible...*” and, for a non-copula verb, “now + past tense,” as in “*He now saw that...*” K. Nikiforidou provides “a detailed blueprint of the blending mappings cued by the [past + proximal deictic] pattern” [20].

Polysemy

The mechanisms reviewed in the previous sections receive a generalized analysis in [21] to explain polysemy as a consequence of blending. Some of the products of such blending strike hearers as “metaphoric” for reasons analyzed in [22].

X is the Y of Z

All constructions prompt for blending, but certain constructions are specialized to serve as prompts for blending over all conceptual domains. Consider Turner’s analysis in *Death is the Mother of Beauty* of conceptual connections and their integration [23]. Its data consisted of uses of kinship terms, such as “mother.” The sentential construction involved in “Death is the mother of beauty” is the “X is the Y of Z” construction. This xyz construction has routine everyday use, as in “Paul is the father of Sally.” It has been analyzed by M. Turner [24; 22] and G. Fauconnier and M. Turner [2]. There are various constructions related to X is the Y of Z, as explained in [2; 21; 22; 23; 24; 26].

Single Words and Morphemes

There are many linguistic prompts for blending that are narrower in application. “Safe”, for example, said of some situation, prompts us to blend that situation with the frame of *harm*, understand that the blend is counterfactual with respect to the original situation, and now blend the original situation and the counterfactual blend so that the counterfactual relation between them is compressed to *absence of harm* as emergent structure in the blend, understood as a property, *safe*, that can be signaled by an adjective. Other single words prompting

for particular blending templates include “danger”, “lucky”, “accident”, “mistake”, “gap”, “dent”, “missing”, “detour”, and many others. A single sentence can contain many such words, calling for many such compressions, as in the National Public Radio warning a few days before Halloween, October 2000, “A halloween *costume* that *limits* sight or movement is an *accident lurking in disguise*”. M. Turner [27] analyzes the range of blending compressions involved in The morphemes “over” and “under.” N. Mandelblit analyzes the use of morphological inflection of a main verb to prompt for blends of the frame of an action with the frame of causation (reviewed in [2]).

Adjective + Noun

Consider adjectives, such as those in *guilty pleasures*, *likely candidate*, and *red ball*. Notice that “likely candidate” (Eve Sweetser’s example) is usually used to refer to someone who is not (yet) a candidate. In that case, we are not composing the meaning of *candidate* and the meaning of *likely*. On the contrary, we are taking *candidate* from one mental space and *likely* from a mental space that includes a particular kind of frame. “Likely candidate” can be taken as prompting us to construct a blended frame in which there is someone who is likely to become a candidate. In “*Allow yourself this guilty pleasure*” and “*Chocolate is a guilty pleasure*”, it is not the pleasure itself that is guilty. Rather, it is the person who has the pleasure who feels guilty. In this case, there is a cause-effect vital relation between the input spaces – having the pleasure in one space causes the guilt in the other. But now, that outer-space cause-effect relationship is compressed in the blend into a feature of the pleasure. There are many similar examples, such as *grateful memories*. The memories are not grateful. The person who has the memories is grateful for the events to which the memories refer. But now that intentional relationship between the person and the person’s memories and the events to which they refer is compressed into a feature of the memories in the blend.

Basic Clauses

G. Fauconnier and M. Turner [25] build on A.E. Goldberg [28] to analyze the ways in which basic clausal constructions like Caused-Motion, Resultative, and Ditransitive prompt for blending basic and familiar human-scale frames with sometimes large mental webs in order to produce compressed blends that can be expressed with the clausal form projected to the blend. The result is expressions that use verbs suited to other mental spaces in the web but not necessarily to caused-motion, resultative, or ditransitive frames. Goldberg presented Caused-Motion examples like *He sneezed the napkin under the table* and *She drank him under the table*. Others include *The officer waved the tanks into the compound*, *Junior sped the car around the Christmas tree* (where the verb comes from the manner of the caused motion), *I read him to sleep*, *I muscled the box into place*, and *Hunk choked the life out of him*. The case is similar for the Resultative construction, the Ditransitive construction, and other clausal constructions.

Blended Syntax

Blends frequently have new emergent structure, but because linguistic constructions attached to the input spaces in the mental web can be projected down to be used of the blend to express that emergent structure, it is rare that new linguistic constructions are needed in order to express meaning, and a good thing, too. But blending also provides a mechanism for creating emergent structure for the form part of a form-meaning pair.

Ch. J. Fillmore and B.T. Atkins [29] presented the classic analysis of the verb *risk*, and the syntax of the verb *risk*, and its meaning. In effect, they analyze the lexical meaning of *risk* as a set of frame blends, as reviewed in [30]. G. Fauconnier and M. Turner [2] analyze nominal compounding as blended syntax, in which one noun is taken from each of two blended spaces, and the blend is expressed by a syntactic structure Noun + Noun, which still counts as a noun phrase and so can combine in the usual ways with constructions that call for a noun phrase. G. Fauconnier and M. Turner [31; 2] also provide an elaborate analysis of French double-verb causatives as an example of emergent syntax under blending.

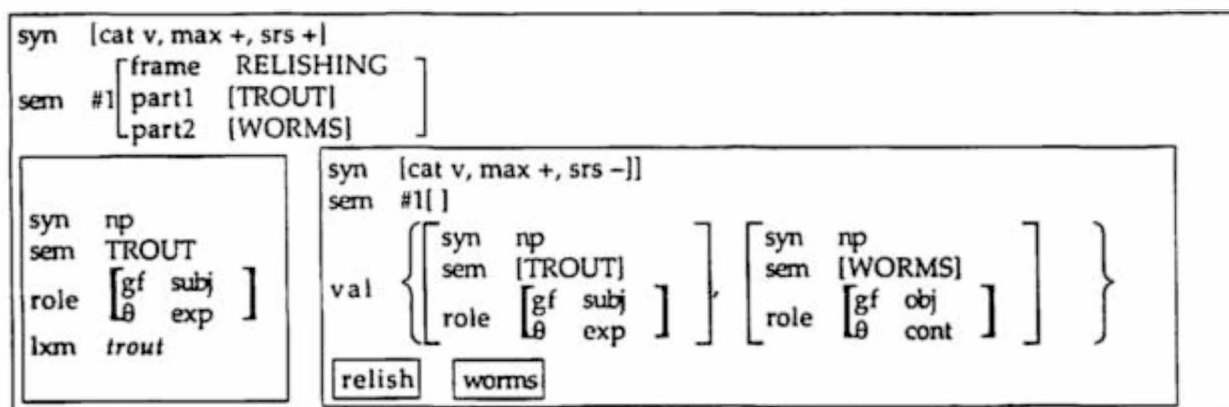
Related work on blending in communication

Graph theory provides mathematical tools for crafting formal representations of patterns of various types, for determining relationships (such as subsumption) between those formalizations, and for unifying those formalizations. Graph theory is the foundation of formal approaches in unification grammars [32] such as Functional Unification Grammar, Definite-Clause Grammars, Lexical-Function Grammar, Generalized Phrase Structure Grammar, and Head-Driven Phrase Structure Grammar. Unification grammars typically represent a construction as an attribute-value matrix (AVM), and in fact an AVM is simply an object in graph theory. Many readers will be familiar with the extraordinarily influential work on AVMs in the never published but legendary Construction Grammar Coursebook by Charles Fillmore and Paul Kay, such as the AVM for the lexical construction *shoe*,

sem #1[]	
syn [cat n, max +]	syn [cat v, max +]
role [gf subj]	sem #1[]

syn	cat	n
	proper	-
	max	-
	lex	+
sem	bounded	+
	cnfg	count
	num	sg
lxm	shoe	

a very simplified AVM for the Subject-Predicate Construction, and the “unified” AVM representing the construct that is the sentence *Trout relish worms*.



In graph theory, an AVM is an instance of a Directed Acyclic Graph (DAG) [33]. DAGs can be unified in graph theory through certain established algorithms. A unification of two DAGs is the most general graph that includes all the information in all of the inputs, if it exists.

The operation postulated as Merge in the Minimalist Program [34] is to a great extent a notational variant of DAG unification in graph theory. (Of course, AVM unification in unification grammars operates over various assumed types of structure – syntactic, semantic, pragmatic, phonological, etc. – while Merge in the Minimalist Program is restricted to syntactic objects.) Both DAG unification and Merge embrace recursion.

DAG unification and Merge are interesting theoretically, but the major question from blending theory is: what is the *cognitive* basis for stipulating that DAG unification or Merge are human capacities? Certainly, human beings can do such things, but stipulating that they can takes out a loan of theory that needs, from a cognitive perspective, to be cashed out: what is the non-linguistic mental operation that makes these linguistic powers possible? The assertion of the present article is that the indispensable mental operation is *blending*.

There is also a relatively minor objection from blending theory. DAG unification or Merge are handy if the goal is to craft algorithmic processes for natural language processing: the mathematical theory and computational practices are strong and productive. The author is co-director of the Red Hen Lab [<http://redhenlab.org>], which uses many computational systems that depend upon such algorithmic unification models. But DAG unification or Merge are bad as linguistic theory, because they do not have room for *selective projection* and *emergent structure*, argued to be indispensable in the blending analyses of linguistic phenomena, some of which are mentioned in the preceding section of this article. Most important, DAG unification and Merge do not account for the creativity we see in the origin of form-meaning pairs, the ontogenetic acquisition and development of form-meaning pairs, the phylogenetic development of form-meaning pairs, and the creation of new form-meaning pairs. A theory that does not account for such creativity is not a theory of human language, although it might, and manifestly often does, provide structure for the development of efficient and useful natural language processing tools.

The justification for stipulating the existence of a process in a scientific model is usually that such a scientific generalization allows us to “explain” a great deal in a compendious fashion, one that is not deeply disconfirmed by vast stretches of available evidence. The successful generalization is one that applies aptly to ranges of data that were not in the original data the contemplation of which led to the original hypothesis of the scientific generalization. This is the justification upon which the assertion of operations like DAG unification on Merge rests. Blending theory also asserts this justification, and additionally argues that it does a better job of accounting for the evidence, such as the evidence for various kinds of invention, innovation, and creativity. But there is a second justification, the principal emphasis of this article, that blending asserts: it does not stipulate the existence of language-specific mental operations, leaving it to cognitive scientists and psychologists and neuroscientists to go and locate them. On the contrary, the existence of blending and of its mechanisms is asserted on the basis of broad analysis of evidence from non-linguistic thought and action. Blending theory does not need to stipulate to the existence of a linguistic operation with certain powers in order to account for language; on the contrary, it adduces one that has already been analyzed outside of language science.

Within cognitive and functional approaches to language, there are repeated presentations of processes of language that look much like blending. The most prominent and thorough of these theories is Cognitive Grammar [35]. R.W. Langacker writes, for example, that “One constructional schema can be incorporated as a component of another” [35, p. 46]. These many analyses include considerations of coercion when two units combine [36, p. 287], partial sanctioning of a unit, and extension and innovation during the combination of units [37, p. 215–255]. The thorough attention to varieties of unification and combining is present in Cognitive Grammar from its earliest days. For example, in his landmark introduction to the field in *Cognitive Science* [16], R.W. Langacker writes:

- When a head combines with a modifier, for example, it is the profile of the head that prevails at the composite-structure level [16, p. 13].
- Each sense of *ring* . . . combines with the phonological unit [ring] to constitute a symbolic unit [16, p. 18].
- an auxiliary verb, either *have* or *be*, combines with the atemporal predication and contributes the requisite sequential scanning [16, p. 27].
- A modifier is a conceptually dependent predication that combines with a head, whereas a complement is a conceptually autonomous predication that combines with a head [16, p. 34].
- [Of the sentences “Liver likes Alice” and “Alice likes liver] It should be apparent, however, that the same composite structure will result if the constituents combine in the opposite order, with *Alice* elaborating the schematic trajector of *likes*, and then *liver* the schematic landmark of *Alice likes*. This alternative

constituency is available for exploitation, with no effect on grammatical relations, whenever special factors motivate departure from the default-case arrangement [16, p. 35].

It may be that R.W. Langacker and other cognitive and functional linguists would agree [no doubt with illumination or objection, and only to a certain extent] that such analyses presuppose general cognitive mechanisms not specific to language and that indeed the chief one they presuppose is *blending*.

In response to this section, R.W. Langacker writes (p.c., and published here with his permission): “I fully agree that CG ‘analyses presuppose general cognitive mechanisms not specific to language and that indeed the chief one they presuppose is *blending*’. I have long taken it for granted that conceptual and grammatical structures can be characterized in terms of mappings between mental spaces, and in particular, that ‘composition’ amounts to (bipolar) blending. This conforms to my traditional description that component structures are ‘integrated’ to form the composite whole. Perhaps because it is so evident, I have not made the connection to conceptual integration theory as explicit as I perhaps should have done. Here is one succinct statement: ‘In *composition*, **component structures** undergo **conceptual integration** to form a **composite structure** that is more than just the sum of its parts’ ” [38, p. 118]. Slightly more elaborate indications of the affinity are found in [39, p. 47] and [40, p. 135–136].

Multimodal communicative blending

To know a language is to know a relational network of form-meaning pairs and how they blend to produce expressions. More generally, to know a communicative system is to know a relational network of form-meaning pairs and how they blend to produce performances. Part of the reason that we can understand text is that we can simulate mentally, in the backstage of cognition, a whole human performance whose language we would write down as that text. This is easy to demonstrate: if we hand anyone a text to read aloud, for example, they will do so with a great range of auditory and bodily performance that is nowhere “encoded” in the text but that seems to them obviously to be part of its actual performance. It is an oversight to claim that these aspects of performance are irrelevant to the text on the ground that we do not have to perceive them to understand the text. What we do not perceive we may well imagine. All understanding happens in the hearers, not in the texts.

There are many forms – auditory, visual, and textual – that we take to have a special relationship to *a language*, traditionally considered. But blending forms with communicative function is quite general; this blending for communication includes co-speech gesture broadly considered; the use of material affordances in the environment as props broadly considered; and a great range of auditory, visual, and motor performances, including pauses, laughter, clicks, taps, shoves, pokes, winks, nods, singing, whistling, cartoons, movies, music, television news, and on and on. Theoretically, we draw distinctions between performances in this ocean of

performance, and are unlikely to agree to homogenize all such form-meaning pairs and their blends to the same communicative status. But the general theory of form-meaning pairs and their blends applies to all such performances [41].

Consider an example: someone sees a termite doing something to wood. The meaning attached to the form “food” certainly does not include wood, but people can make a blend of a person eating food and what the termite is doing to the wood. This blend is not an algorithmic unification of these two quite different input spaces, but instead a new mental space constructed through selective projection from these inputs and conceptual elaboration to produce emergent structure in the blend. Crucially, forms that apply to any of the input spaces (and there can be many) can be projected to the blend to pick out corresponding meaning there, despite its not conforming to the meaning in the input from which it was projected. The wood can now be referred to as “food.”

In the same way, the young child who sees a lion at the zoo for the first time can point and say “kitty” to the delight of charmed adults. As analyzed in [2], projection and blending of forms to refer to meaning developed in new situations solves the problem of equipotentiality.

T. Nessel et al. explores linguistic creativity under blending by looking at a corpus of TV news clips in Russian and in English and investigating the use of “the five Russian deictic words that correspond to the English meanings ‘here’ and ‘now’: *zdes’*, *tut*, *sejčas*, *teper’* and *vot* [42, p. 229]. These are forms with routine if quite complicated use in actual scenes of face-to-face classic joint attention [43]. They acquire slightly different sets of distributions for TV news. The English and Russian words acquire in the usage domain of TV network news distinct radial category profiles, in the sense that they display different centers of gravity in the semantic network. The authors propose the “Minimal Adaptation Hypothesis” “according to which language makes adaptations that are as small as possible when applied to a new setting, such as the one created by TV” [42, p. 229]. This is unrecognized but impressive creativity.

This creativity is open-ended. In the case of web tutorials, the tutor can say “If you have any questions about getting the data from your old hard drive to your new hard drive, we made a video for you that covers the process, and we will link to it, right there” and points to and looks at the word “HERE” which appears suddenly in the blended ground when she points and says “there”. The printed word “HERE” is a form, and we know that its deployment in the blend carries the new, creative meaning that clicking on the visible spot directs a web browser to the linked URL. Accordingly, the form “HERE” acquires a new meaning, for the blend, that it does not otherwise have. M. Turner discusses such creativity through blending for a range of linguistic forms, from lexical to clausal [43].

Conclusion

In 1996, in a chapter titled “Language,” in *The Literary Mind: The Origin of Thought and Language*, I argued that “Cognitive mechanisms whose existence we must grant independent of any analysis of grammar can account for the origin of grammar” [3, p. 141]. That argument showcased blending in the creation of

constructions and the combining of constructions, and in human linguistic innovation. The present article advances the same claim again, more than twenty years later, but this time citing some of the work on blending in language and communication done recently. This article does not claim that any specific analysis of a specific linguistic phenomenon in the literature should be discarded or displaced by a blending approach, or that processes that look much like blending have not been discussed widely by language scientists during the last several thousand years. On the contrary, those many stipulations of linguistic processes need, to count as cognitive linguistics, a grounding in mental operations whose existence and power we must grant independent of any analysis of grammar. My claim is that the obvious candidate for this cognitive anchoring is *blending*. To be sure, in the conversation between theory of blending and theory of linguistic phenomena, there will be many detailed moments of analytic contest between theories. Such a conversation is indispensable for the progress of science. Properly conducted, it will strengthen and improve both blending theory and cognitive linguistics.

REFERENCES

1. *Fauconnier, G.* Conceptual Projection and Middle Spaces. UCSD Department of Cognitive Science Technical Report 9401 / G. Fauconnier, M. Turner. – 1994. – 39 p.
2. *Fauconnier, G.* The Way We Think : Conceptual Blending and the Mind's Hidden Complexities / G. Fauconnier, M. Turner. – Basic Books, 2002. – 440 p.
3. *Turner, M.* The Literary Mind: The Origins of Thought and Language / M. Turner. – N. Y.: Oxford Univ. Press, 1996. – 208 p.
4. *Fauconnier, G.* Mappings in Thought and Language / G. Fauconnier. – Cambridge : Cambridge Univ. Press, 1997. – 205 p.
5. *Turner, M.* Cognitive Dimensions of Social Science : The Way We Think About Politics, Economics, Law, and Society / M. Turner. – N. Y.: Oxford Univ. Press, 2001. – 183 p.
6. *Fauconnier, G.* Rethinking Metaphor / G. Fauconnier, M. Turner // Cambridge Handbook of Metaphor and Thought. – N. Y.: Cambridge Univ. Press, 2008. – P. 53–66.
7. *Turner, M.* The Mind is an Autocatalytic Vortex / M. Turner // Yearbook of Research in English and American Literature / ed. by J. Schlaeger. – 2008. – Vol. 24. – Tübingen, Germany : Gunter Narr Verlag, 2008. – P. 13–43.
8. *Turner, M.* Ten Lectures on Mind and Language. Eminent Linguists Lecture Series / M. Turner. – Beijing : FLTR Press, 2011. – 292 p.
9. *Turner, M.* The Origin of Ideas : Blending, Creativity, and the Human Spark / M. Turner. – N. Y.: Oxford Univ. Press, 2014. – 301 p.
10. *Turner, M.* Mental Packing and Unpacking in Mathematics / M. Turner // Semiotic and Cognitive Science Essays on the Nature of Mathematics. – Munich : Lincom Europa, 2012. – P. 248–267.
11. *Alexander, J. C.* Blending in mathematics / J. C. Alexander // Semiotica. – 2011. – Issue 187. – P. 1–48.
12. *Lakoff, G.* Where Mathematics Comes From : How the Embodied Mind Brings Mathematics into Being / G. Lakoff, R. Núñez. – N. Y.: Basic Books, 2000. – 493 p.
13. *Fauconnier, G.* Mental spaces : Aspects of meaning construction in natural language / G. Fauconnier. – Cambridge, MA : MIT Press, 1985. – 185 p.
14. *Dancygier, B.* Mental Spaces in Grammar : Conditional Constructions / B. Dancygier, E. Sweetser. – Cambridge : Cambridge Univ. Press, 2005. – 295 p.

15. *Tobin, V.* Grammatical and Rhetorical Consequences of Entrenchment in Conceptual Blending : Compressions Involving Change / V. Tobin // *Meaning, Form, and Body* / ed. by F. Parrill, V. Tobin, M. Turner. – Stanford : Center for the Study of Language and Information, 2010. – P. 329–347.
16. *Langacker, R. W.* An Introduction to Cognitive Grammar / R. W. Langacker // *Cognitive Science*. – Vol. 10, Iss. 1. – 1986. – P. 1–40.
17. *Sweetser, E.* Introduction : viewpoint and perspective in language and gesture, from the Ground down / E. Sweetser // *Viewpoint in Language : A Multimodal Perspective* / ed. by B. Dancygier, E. Sweetser. – Cambridge UK : Cambridge Univ. Press, 2012. – P. 25–46.
18. *Recanati, F.* Le present epistolaire : Une perspective cognitive / F. Recanati // *L'Information grammaticale*. – 1995. – № 66. – P. 38–44.
19. *Nikiforidou, K.* Viewpoint and construction grammar : The case of *past* + *now* / K. Nikiforidou // *Language and Literature*. – 2010. – № 19 (2). – P. 265–284.
20. *Nikiforidou, K.* The constructional underpinnings of viewpoint blends : The *Past* + *now* in language and literature / K. Nikiforidou // *Viewpoint in Language : A Multimodal Perspective* / ed. by B. Dancygier, E. Sweetser. – Cambridge UK : Cambridge Univ. Press, 2012. – P. 177–197.
21. *Fauconnier, G.* Polysemy and Conceptual Blending / G. Fauconnier, M. Turner // *Polysemy : Flexible Patterns of Meaning in Mind and Language* / ed. by B. Nerlich, V. Herman, Z. Todd, D. Clarke. – Berlin; N. Y.: Mouton de Gruyter, 2003. – P. 79–94.
22. *Turner, M.* Figure / M. Turner // *Figurative Language and Thought*. – N. Y.: Oxford Univ. Press, 1998. – P. 44–87.
23. *Turner, M.* Death is the Mother of Beauty : Mind, Metaphor, Criticism / M. Turner. – Univ. of Chicago Press, 1987. – 220 p.
24. *Turner, M.* Reading Minds : The Study of English in the Age of Cognitive Science / M. Turner. – Princeton Univ. Press, 1991. – 298 p.
25. *Fauconnier, G.* Blending as a Central Process of Grammar / G. Fauconnier, M. Turner // *Conceptual Structure, Discourse, and Language* / ed. by A. Goldberg. – Stanford : Center for the Study of Language and Information, 1996. – P. 113–130.
26. *Francis, S.* Multimodal Construction Grammar / S. Francis, M. Turner // *Language and the Creative Mind* / ed. by M. Borkent, B. Dancygier, J. Hinnell. – Stanford, CA : CSLI Publications, 2014. – P. 255–274.
27. *Turner, M.* The Way We Imagine / M. Turner // *Imaginative Minds : Concepts, Controversies and Themes* : Proc. of the British Academy / ed. by I. Roth. – London : British Academy. – 2007. – P. 213–236.
28. *Goldberg, A. E.* Constructions : A Construction Grammar Approach to Argument Structure Constructions / A. E. Goldberg. – Chicago; London : Univ. of Chicago Press, 1995. – 265 p.
29. *Fillmore, Ch. J.* Towards a frame-based organization of the lexicon : the semantics of RISK and its neighbors / Ch. J. Fillmore, B. T. Atkins // *Frames, fields and contrast : new essays in semantics and lexical organization* / ed. by A. Lehrer, A. E. Kittay. – Hillsdale, NJ : Erlbaum, 1992. – P. 75–102.
30. *Turner, M.* Blending in Language and Communication / M. Turner // *Handbook of Cognitive Linguistics* / ed. by E. Dąbrowska, D. Divjak. – Berlin : De Gruyter Mouton, 2015. – P. 211–232.
31. *Fauconnier, G.* Blending as a Central Process of Grammar / G. Fauconnier, M. Turner // *Conceptual Structure, Discourse, and Language* / ed. by A. Goldberg. – Stanford : Center for the Study of Language and Information, 1996. – P. 113–130.
32. *Shieber, S. M.* An Introduction to Unification-Based Approaches to Grammar / S. M. Shieber. – Cambridge Univ. Press, 1995. – 105 p.
33. *Harary, F.* Graph Theory / F. Harary. – Philippines : Westview Press, 1969. – 274 p.
34. *Chomsky, N.* Derivation by phase / N. Chomsky. – Cambridge, MA : MIT Press, 1999. – 43 p.
35. *Langacker, R. W.* Cognitive Grammar / R. W. Langacker // *Cognitive Linguistics : Basic Readings*. – Berlin : Mouton de Gruyter, 2006. – P. 29–67.

36. *Taylor, J. R. Cognitive Grammar* / J. R. Taylor. – Oxford : Oxford Univ. Press, 2002. – 621 p.
37. *Langacker, R. W. Cognitive Grammar : A Basic Introduction* / R. W. Langacker. – Oxford : Oxford Univ. Press, 2008. – 562 p.
38. *Langacker, R. W. Ten Lectures on the Elaboration of Cognitive Grammar (Distinguished Lectures in Cognitive Linguistics)* / R.W. Langacker. – Leiden and Boston : Brill, 2017. – 367 p.
39. *Langacker, R. W. Metonymic Grammar* / R.W. Langacker // *Metonymy and Metaphor in Grammar* / ed. by K.-U. Panther, L. L. Thornburg, A. Barcelona. – Amsterdam and Philadelphia: John Benjamins, 2009. – P. 45–71.
40. *Langacker, R. W. Construal* / R. W. Langacker // *Handbook of Cognitive Linguistics* / ed. by E. Dąbrowska and D. Divjak. – Berlin, Boston : De Gruyter Mouton, 2015. – P. 120–143.
41. *Turner, M. The Role of Creativity in Multimodal Construction Grammar* / M. Turner // *Zeitschrift für Anglistik und Amerikanistik*. – 2018. – Vol. 66, Issue 3. – P. 357–370.
42. How here and now in Russian and English establish joint attention in TV news broadcasts / T. Nessel [et al] // *Russian Linguistics*. – 2013. – Vol. 37. – P. 229–251.
43. *Turner, M. Multimodal Form-Meaning Pairs for Blended Classic Joint Attention* / M. Turner // *Linguistics Vanguard : A Multimodal Journal for the Language Sciences*. – 2017. – P. 1–7.

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