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On Metaphor and Blending[1]

There is a mistaken perception that 'metaphor theory' and 'conceptual blending' are competing views, and that there is some argument between us over this. The real situation is this: We have been good friends and colleagues for over forty years, and we remain so. We fully respect, and make use of, each other's work. We are both scientists, who do both empirical research and theorizing. We see the research programs developed for metaphor and blending as mutually reinforcing and often deeply intertwined, rather than at odds with each other. So why do some see discord where we find remarkable convergence? The short answer is that over the years, we focused on what we were most interested in, with corresponding differences of emphasis and interpretation. To explain how all this unfolded, and dispel the view that pits metaphor against blending, we need to go over the basic developments over time in the study of conceptual metaphor and blends, and then do a comparison.

Keywords: conceptual metaphor, blending.

1. CONCEPTUAL METAPHOR

Research on conceptual metaphor went through various stages.

(1) *Metaphors We Live By* was worked out in 1979 and published in 1980. It assumed that conceptual metaphors were cognitive mappings from frame to frame across domains. It observed that certain metaphors had an 'experiential basis'. Others seemed not to.

(2) Mid-1980s: There were various discoveries. Some metaphors appeared to be widespread across language areas. The cross-linguistic ones all had common experiential bases. Metaphorical mappings appeared to 'preserve image schema structure', and the inferences that came with the image-schema structure of source domain frames. Complex conceptual metaphors were shown to be combinations of simpler metaphors, image-schemas, and frames.

(3) More Than Cool Reason, written in 1987, published in 1989. Lakoff and Turner showed that there were 'generic-level' metaphors — mappings at a high level, with specific

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content added at a lower level. Poetic metaphors were typically made up of high-level generic content plus lower-level content, typically from frames.

(4) Jerome Feldman came to Berkeley in 1988. He and Lakoff began NTL, the neural theory of language, with Terry Regier as the first graduate research assistant. The goal was to show how cognitive linguistics worked in the brain. Regier made important progress in understanding universal elementary image-schemas and the way they fit together to give very different systems of spatial relations from language to language. This research had become clear by around 1992-3, and culminated in Regier's 1995 thesis, published in 1996. During this time, there was a lot of research in the group by Lokendra Shastri and his students, attempting to develop a theory of neural binding — and a notation for cognitive semantics was developed with neural binding playing a major role.

(5) By 1995, thesis research by Srini Narayanan, Joe Grady and Christopher Johnson led to the neural theory of metaphor and metaphor learning, published in a thesis by Narayanan in 1997. This led to a full-blown neural theory of metaphor centering on 'primary metaphors' — *Philosophy in the Flesh*, written between 1992 and 1997 and published in 1999. In the neural theory, the old 'conceptual metaphors' are replaced by neural mappings, which are relatively simple neural circuits. This was used in *Where Mathematics Comes From*, published in 2000, in which Rafael Núñez and Lakoff grounded mathematics in embodied experience, and neural metaphorical mappings, making extensive use of conceptual blending characterized in terms of binding.

(6) Between 1996 and 2006, Lakoff applied these results to understand political conceptual systems. In 2006, Feldman published *From Molecules to Metaphors*, a simple introduction to some of this research. Between 2008 and 2010, Lakoff developed the theory of neural cognition and language, in which combinations of simple neural circuits are shown to be capable of carrying out conceptual mappings. It included a new, simple theory of neural binding. And it used a version of Feldman's Embodied Construction Grammar notation to characterize cognitive linguistics, with precise mappings from the ECG notation to the Neural Linguistics notation. Narayanan, in 2010, showed how a low-level property of neural synapses explains the directionality of conceptual metaphors.

2. THE DEVELOPMENT OF MENTAL SPACE AND BLENDING THEORY

Research on mental spaces went through various stages:

(1) The initial work on mental spaces started in 1977, showing how a number of logical phenomena – opacity, presupposition projection, role/value ambiguities, counterfactuals – followed from properties of mental space connections built up in discourse. It is

noteworthy that Lakoff's own work on counterparts, dating back to 1968, played an important role in opening up this line of research. Versions of the book *Mental Spaces* appeared in 1984 and 1985. Mental spaces and their connections were viewed as cognitive constructs. There was no mention of how they might be instantiated neurally, but Shastri and Lakoff noted early on that such connections were presumably neural bindings.

(2) John Dinsmore (*Partitioned Representations* – 1991) expanded the scope of the framework, by showing how mental space constructions accounted for tense and viewpoint phenomena in language. This approach was pursued and developed in great detail by Michelle Cutrer (*Time and Tense in Narratives and Everyday Language* – 1994). Eve Sweetser and others generalized these results to mood and epistemic stance. Analogical counterfactuals were also studied during this period (1991); they involved multiple spaces and frames connected by analogy and identity mappings, giving rise to new mental spaces (what would later be called blended spaces).

(3) Beginning in the early 1990s, Fauconnier and Mark Turner began empirical and theoretical research on conceptual blends. They assumed Fauconnier's account of mental spaces and the pre-neural version of conceptual metaphor theory, both of which used 'conceptual mappings', with no commitment as to their neural substrate. They also incorporated Lakoff and Turner's notion of the 'generic level'. A 'conceptual blend' used various mental spaces and mappings across them: A generic space, input spaces, and a blended space, with mappings from the input spaces to the blended space. The 'mappings' were purely conceptual, with no neural component, except for the plausible idea that space connections were instantiated by neural bindings. Conceptual metaphor theory was accepted and used. Conceptual metaphors were seen as mappings from one input space to another. From the Blending perspective, 'mappings' were generalizations over mental space mappings, metaphorical mappings and the mappings that formed blends. The word 'metaphor' itself is ambiguous between such conceptual mappings between spaces, and surface products also called 'metaphors', which can result from multiple mappings and blending (*Blending and Metaphor* – Grady, Oakley & Coulson 1999).

(4) Many scholars expanded the research on blending during the 1990s: in particular, Nili Mandelblit showed in great detail the role of blending in grammar and morphology, Seana Coulson studied multiple blends at work in metaphor and counterfactuals and developed experimental ERP techniques to corroborate the psychological reality of the theoretical constructs, Eve Sweetser analyzed the role of blending and metaphor in social rituals and the construction of noncompositional meaning. An essential contribution was Edwin Hutchins' theory of material anchors, showing the role of blending in material

culture. Bob Williams and Esther Pascual independently did extensive empirical work showing how to integrate the conceptual mappings approach with Hutchins' distributed cognition. Scott Liddell and his associates applied all this with great success to the grammar of signed languages. Finally, the work by Lakoff and Núñez, already mentioned above, extended considerably and creatively to all of classical mathematics the case of complex numbers used in early work on blending by Fauconnier and Turner.

(5) A new turn was taken in 1999 by Fauconnier and Turner, who discovered the systematic nature of compression in integration networks. This was an empirically based theoretical advance, that allowed the formulation of governing principles and optimality constraints on blending processes (see *The Way We Think*, especially Chapter 16).

3. BLENDING IN THE NEURAL THEORY

During the 1990s, when blending research was expanding, neural research at Berkeley was highly focused on neural binding research. Lakoff, looking at Narayanan's neural theory of metaphor and accounts of neural binding, concluded that at the neural level, the blending theory's generalization across mappings in metaphors and blends did not hold at the neural level. Different circuitry was needed. According to Lakoff, neural binding circuitry is necessary to accomplish blending, but is insufficient for metaphorical mappings. This is discussed in Lakoff's 2009 paper on the neural theory of metaphor in Raymond Gibbs' collection, *The Cambridge Handbook of Metaphor*. Lakoff argues that the governing principles and optimality constraints on blends, which he accepts as empirically correct, follow from the best-fit principles governing neural circuitry. Blends can be represented in formal notation in current neural linguistics.

4. METAPHOR IN BLENDING THEORY

In the same collection by Gibbs, Fauconnier and Turner have a paper showing how metaphors as surface products can result from complex integration networks with multiple metaphorical mappings, metonymic mappings and blended spaces. TIME as SPACE is the case study. This account is sharply different from the ones given in early metaphor and blending theories. But interestingly, it seems totally compatible with the binding mechanisms proposed within Neural Linguistics, in which neural bindings of metaphors, metonymies, and blends, appear to be able to cover the same range of cases.

5. A COMPARISON

Note that both of us — Fauconnier and Lakoff — were engaged in empirical and theoretical science over the same years, but in the mid-nineties Lakoff explicitly adopted a neurally-based paradigm. Both approaches assumed the empirical correctness of conceptual metaphor, mental spaces, and

blends. But the different theoretical paradigms (conceptual mappings vs. neural circuitry of various kinds) do not necessarily yield exactly the same results, though there is considerable overlap.

A fascinating goal of neural linguistics is to explain at a deeper level, principles and generalizations discovered through linguistic analysis. For example, the extensive properties of blends discussed by Fauconnier and Turner in *The Way We Think* are explained in Neural Linguistics by the best-fit principles governing neural circuitry.

6. WHY THERE IS NO CONFLICT

Our brief recapitulation stresses the obvious: for over thirty years, the different strands of research on conceptual mappings within cognitive linguistics have continuously reinforced each other, producing worthwhile generalizations and deeper understanding along the way. There would be no conceptual blending framework without conceptual metaphor theory, and there would be no neural linguistics without the elaborate linguistic analysis carried out in the 1980s and '90s.

This last point deserves some emphasis: neural linguistics is exciting and successful because it brings in not only biological and computational dimensions of neural systems but also well-established cognitive results obtained through theoretical analysis and extensive empirical observation.

If you are a researcher, you generally have to choose detailed methods of analysis. If there is a need to choose, the choices appear to the chooser to be in conflict. They aren't. You can choose both, for different aspects of your analysis, depending on what is needed for your purposes. The neural theory happens to use a notation for cognitive linguistics that makes no mention of neural circuitry, but can map onto neural circuitry in a straightforward way.

What is important is a recognition that different enterprises developed with seemingly different purposes and different theoretical constructs can mutually reinforce each other, lead to deeper convergent perspectives, and achieve wide-ranging scientific goals. This is clearly what we also see in arguably more mature sciences like physics or biology.

One of the central points of agreement between us is that traditional linguistic research looking at a vast range of data and generalizing over the data is the basic empirical methodology of linguistics and one of the most important empirical methodologies in cognitive science. But the term 'empirical' seems to get confused with 'experimental'. Experiments are a welcome source of additional, and sometimes crucial, empirical material. But we note a tendency to call anything that's not experimental, 'non-empirical' and so by implication 'speculative', 'unproven', etc. As a result, we notice a trend in moving away from the great strength of cognitive linguistics: the analysis of massive amounts of linguistic data – especially in the area of semantics. We look forward to a return to that tradition.

We remain dedicated to empirical research on what we find most fascinating. We certainly agree that metaphors and blends are among the most interesting phenomena in the cognitive sciences, and should be studied in enormous detail.

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