

THE WAY WE THINK

Conceptual Blending and the Mind's Hidden Complexities



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■ OVERVIEW BY CHAPTER

PART ONE: THE NETWORK MODEL

1 The Age of Form and the Age of Imagination

We evoke some of the twentieth century's most noteworthy achievements: the magic of computers, the discovery of the genetic code, the broad application of the axiomatic method in the formal sciences and of structuralism in the social sciences. This was the century of form approaches, an impressive array of methods for discovering and manipulating meaning through systematic analysis of form. Yet to achieve these remarkable results, formal manipulations needed to take for granted the operations of a brain evolved over three billion years and trained throughout several months of early individual life. Identity, integration, and imagination—basic, mysterious, powerful, complex, and mostly unconscious operations—are at the heart of even the simplest possible meanings. The value of the simplest forms lies in the complex emergent dynamics they trigger in the imaginative mind. These basic operations are the key to both the invention of everyday meaning and exceptional human creativity.

2 The Tip of the Iceberg

Operations for the construction of meaning are powerful but for the most part invisible. Our theme is the basic mental operation we call *conceptual blending*. We begin by presenting some examples in which the blending is hard to miss. The first of these, in the section titled "The Iron Lady and the Rust Belt," illustrates a type of counterfactual reasoning that plays an important role in political science. This example—easy for humans to

understand, but possessed of a hidden complexity that lies far beyond the capacities of today's most powerful computers—is a remarkable feat of the imaginative dynamics of conceptual blending. “The Skiing Waiter” shows how the same operations work to create emergent action. Other striking examples of conceptual blending include computer interfaces (“The Genie in the Computer”), complex numbers in mathematics (“Crazy Numbers”), sexual practices (“The Image Club”), and the ceremony of college graduation (“Graduation”).

The Elements of Blending 39

Conceptual blending has *constitutive principles*, which we present in detail and illustrate by looking at the riddle of “The Buddhist Monk.”

On the Way to Deeper Matters 59

Some famous cases of conceptual blending in a variety of domains are “The Debate with Kant,” “Regatta,” and “The Bypass.”

Cause and Effect 75

A deeper understanding of blending comes from the study of remarkable compressions in conceptual integration networks, especially the compression of cause and effect. Humans must simultaneously control long diffuse chains of logical reasoning and grasp the global meaning of such chains. This is exactly what integration networks allow them to do. Rituals of birth and marriage depend on elegant and powerful compressions of cause and effect. Equally powerful compressions operate in billboard advertising, mathematical thought, and Dante's *Divine Comedy*.

Vital Relations and Their Compressions 89

Just as the marvelous systematic products of chemistry—acids and bases, colors from titration, metabolism, nuclear decay—are not foretold in the principle that atoms combine to make molecules, so the marvelous systematic products of blending are not foretold in the principle that mental spaces blend to make new spaces with emergent meaning. There is an entire system of interacting

principles behind the possibilities for conceptual blending, and we must grapple with that entire system to explain any one of its products.

Much of that system concerns conceptual compression. Compression in blending networks operates on a surprisingly small set of relations rooted in fundamental human neurobiology and shared social experience. These vital relations, which include Cause-Effect, Change, Time, Identity, Intentionality, Representation, and Part-Whole, not only apply across mental spaces but also define essential topology within mental spaces. Blending, it turns out, is an instrument of compression *par excellence*. One of the overarching goals of compression through blending is to achieve “human scale” in the blended space, where a great deal of conscious manipulation takes place.

7 Compressions and Clashes 113

Compression and decompression of vital relations can produce spectacular examples, such as the scientific explanation of the biological evolution of the American pronghorn and the cultural notions of metempsychosis and reincarnation expressed poetically in William Butler Yeats's “Fergus and the Druid.”

In an elaborate typology of networks, four kinds stand out on a continuum of complexity: *simplex*, *mirror*, *single-scope*, and *double-scope*. At the high end of the continuum of blending complexity, double-scope networks blend inputs with different (and often clashing) organizing frames to produce creative emergent frame structure in a blended space. Double-scope blending is what we typically find in scientific, artistic, and literary discoveries and inventions. Indeed, double-scope creativity is perhaps the most striking characteristic of our species.

8 Continuity Behind Diversity 139

Conceptual integration creates mental products that often seem completely different from one another. This apparent dissimilarity misled previous thinkers into assuming that these products must arise from different mental capacities,

operations, or modules. But in fact they all arise from the same mental operation. There are systematic mapping schemes, and systematic ways of combining them, that underlie ostensibly different conceptions and expressions. Logic and metaphor, for example, equally deploy these systems of mapping and blending.

**PART TWO: HOW CONCEPTUAL BLENDING
MAKES HUMAN BEINGS WHAT THEY ARE,
FOR BETTER AND FOR WORSE**

The Origin of Language

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Human beings are unique in having language, art, religion, culture, refined tool use, fashions of dress, science, mathematics, and inventive forms of music and dance. The fact that these singularities came upon the scene during the Upper Paleolithic presents a major scientific riddle. We offer a solution to that riddle: All these singularities have the same source, the evolution of the capacity for double-scope blending. This explanation is supported by recent archeological, anthropological, and genetic evidence concerning the origin of cognitively modern human beings.

Things

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We make things, carry them, consult them, repair them, teach each other how to use them, adorn ourselves with them, and make gifts of them. Why? Consider the everyday wristwatch. As a thing in itself, it is bizarre and pointless, yet the wristwatch is a material anchor for a fascinating conceptual blend. Drawing on work by Edwin Hutchins on conceptual blending and material anchors, we show how the things that populate human life are props for our double-scope conceptual integration networks. Some of the examples we consider are timepieces; gauges of all kinds, money, souvenirs, tombs, graves, cathedrals, writing, speech, and sign.

The Construction of the Unreal

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Human beings pretend, imitate, lie, fantasize, deceive, delude, consider alternatives, simulate, make models, and propose hypotheses. Our mental life depends in every way

on counterfactual thinking, and the central engine of such thinking is conceptual integration.

The conceptual blends of counterfactual thinking drive scientific thinking. We live in a counterfactual zoo of absent and negative things.

12 Identity and Character

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Our notions of who and what we are depend upon conceptual integration. Among our human mental tricks is the routine blending of two different identities, as in "If I were you, I would quit." Certain very powerful human concepts, such as *personal redemption*, *regaining or restoring honor*, *vengeance*, *vendetta*, and *curse* are actually blend structures. And some of the most influential people are nonpeople who come into our lives through conceptual blending.

13 Category Metamorphosis

269

Human beings frequently transform categories. The new category, although linked to the old one, can have radically emergent structure. *Same-sex marriage*, *complex numbers*, and *computer virus* are all examples of category metamorphosis.

14 Multiple Blends

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Conceptual integration always involves a blended space and at least two inputs and a generic space. In fact, it can operate over any number of mental spaces as inputs. Blending can also apply repeatedly: The product of blending can become the input to a new operation of blending. The examples we consider here range from a newspaper column about the politics of health care (titled "Dracula and His Patients"), to an acrobatic political jeer ("The stork dropped George Bush on third base with a silver spoon in his mouth"), to a letter to the editor about abortion ("As an Unwanted Child Myself . . .").

15 Multiple-Scope Creativity

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This chapter explores the remarkable conceptual creativity that arises in multiple-scope integration networks. In particular, we consider integration networks for anger,

death, corporate feuds, two-edged swords, and trashcan basketball.

Constitutive and Governing Principles

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This is a theoretical chapter in which we examine how human mental powers for double-scope creativity are limited and governed. Interestingly, these limitations provide power to the process.

Cognitively modern human beings use conceptual integration to innovate—to create rich and diverse conceptual worlds that give meanings to our lives—worlds with sexual fantasies, grammar, complex numbers, personal identity, redemption, lottery depression. But such a panorama of wildly different human ideas and behaviors raises a question: Does anything go? On the contrary, conceptual integration operates not only according to a clear set of constitutive principles but also according to an interacting set of governing principles. One set of governing principles has to do with Topology, Pattern Completion, Integration, Maximization of Vital Relations, Intensification of Vital Relations, maintenance of the Web of links in an integration network, the degree to which a blend prompts for its own Unpacking, and the ascription of Relevance to elements in a blend. Yet another set of governing principles has to do with the compression of complicated conceptual networks into a single blend at human conceptual scale. In this chapter, we also review the overarching goals of conceptual integration. We then show how conventional kinds of conceptual integration networks—simplex, mirror, single-scope, double-scope—arise repeatedly because they provide a packaged, all-at-once way to satisfy the governing principles.

Form and Meaning

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Language and other complex human expressive abilities are consequences of the development, fifty thousand years ago, of the uniquely human capacity for advanced conceptual integration. Expressions are prompts for conceptual integration patterns. We use them to prompt

other people to perform conceptual integrations. Once double-scope blending became available to human beings, language arose through cultural evolution in cultural time as opposed to evolutionary time.

18 The Way We Live

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We conclude with a consideration of the central role of conceptual blending in the way we learn, the way we think, and the way we live.