

# SURFACES AND ESSENCES

*ANALOGY AS THE FUEL AND FIRE OF THINKING*



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# PROLOGUE

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## *Analogy as the Core of Cognition*



### Giving Analogy its Due

In this book about thinking, analogies and concepts will play the starring role, for without concepts there can be no thought, and without analogies there can be no concepts. This is the thesis that we will develop and support throughout the book.

What we mean by this thesis is that each concept in our mind owes its existence to a long succession of analogies made unconsciously over many years, initially giving birth to the concept and continuing to enrich it over the course of our lifetime. Furthermore, at every moment of our lives, our concepts are selectively triggered by analogies that our brain makes without letup, in an effort to make sense of the new and unknown in terms of the old and known. The main goal of this book, then, is simply to give analogy its due — which is to say, to show how the human ability to make analogies lies at the root of all our concepts, and how concepts are selectively evoked by analogies. In a word, we wish to show that analogy is the fuel and fire of thinking.

### What Dictionaries Don't Say about Concepts

Before we can tackle this challenge, we need to paint a clear picture of the nature of concepts. It is easy — in fact, almost universal — to underestimate the subtlety and complexity of concepts, all the more so because the tendency to think of concepts in overly simple terms is reinforced by dictionaries, which claim to lay out the various different meanings of a given word by dividing the main entry into a number of subentries.

Take, for example, the noun “band”. In any reasonably-sized dictionary, there will be, in the overall entry for this word, a subentry describing a band as a piece of cloth that can be wrapped around things, another subentry describing how a band can be a colored strip or stripe on a piece of cloth or other type of surface, another subentry

describing a band as a smallish set of musicians who tend to play certain types of music or to use only certain types of instruments, another one for a group of people who work or play together, another one for a wedding ring, another one for a selection on a record or a compact disk, another one for a range of frequencies or energies or prices or ages (etc.), and perhaps a few others. The dictionary will clearly set out these various concepts, all fairly distinct from each other and all covered by the same word “band”, and then it will stop, as if each of these narrow meanings had been made perfectly clear and were cleanly separable from all the others. All well and good, except that this gives the impression that each of these various narrower meanings of the word is, on its own, homogeneous and not in the least problematic, and as if there were no possible risk of confusion of any one of them with any of the others. But that’s nowhere near the truth, because sub-meanings are often closely related (for instance, the colored stripe and the range of frequencies, or the wedding ring and the piece of cloth wrapped around something), and because each of these supposedly clear and separate senses of the word “band” constitutes on its own a bottomless chasm of complexity. Although dictionaries give the impression of analyzing words all the way down to their very atoms, all they do in fact is graze their surfaces.

One could spend many years compiling a huge anthology of photographs of highly diverse wedding bands, or, for that matter, an anthology of photos of headbands, or of jazz bands, or of bands of criminals — or then again, of photos of wildly different chairs or shoes or dogs or teapots or versions of the letter “A”, and on and on — without ever coming close, in any such anthology, to exhausting the limitless possibilities implicitly inherent in the concept. Indeed, there are books of precisely this sort, such as *1000 Chairs*. If the concept *chair* were completely straightforward, it is hard to see what interest such a book could possibly have. To appreciate the beauty, the originality, the practicality, or the style of a particular chair requires a great deal of experience and expertise, of which dictionaries cannot convey even an iota.

One could of course make similar observations concerning the subtleties of various types of bands — thus, one could spend one’s whole life studying jazz bands, or headbands, or criminal bands, and so forth. And even concepts that seem much simpler than these are actually endless swamps of complexity. Take the concept of the capital letter “A”, for instance. One would need many pages of text in complex, quasi-legal language if one were trying to pin down just what it is that we recognize in common among the countless thousands of shapes that we effortlessly perceive as members of that category — something that goes way beyond the simple notion that most people have of the concept “A” — namely, that it consists of two oppositely leaning diagonal strokes connected by a horizontal crossbar.

Indeed, catalogues of typefaces are veritable gold mines for anyone interested in the richness of categories. In the facing figure, we have collected a sampler of capital “A”’s designed for use in advertising, and as is clear from a moment’s observation, any *a priori* notion that one might have dreamt up of *A*-ness will be contradicted by one or more of these letters, and yet each of them is perfectly recognizable — if not effortlessly so when displayed all by itself, then certainly in the context of a word or sentence.



The everyday concepts *band*, *chair*, *teapot*, *mess*, and *letter ‘A’* are very different from specialized notions such as *prime number* or *DNA*. The latter also have unimaginably many members, but what is shared by all their members is expressible precisely and unambiguously. By contrast, in the mental structure underpinning a word like “band”, “chair”, “mess”, or “teapot” there lurks a boundless, blurry richness that is completely passed over by dictionaries, because spelling out such subtleties is not a dictionary’s aim. And the fact is that ordinary words don’t have just two or three but an *unlimited number* of meanings, which is quite a scary thought; however, the more positive side of this thought is that each concept has a limitless potential for variety. This is a rather pleasing thought, at least for people who are curious and who are stimulated by novelty.

### Zeugmas: Amusing Revealers of Conceptual Subtlety

There is a linguistic notion called “zeugma” (also sometimes called “syllepsis”) that, although it is fairly obscure, has a good deal of charm and brings out the hidden richness of words (and thus of concepts). The zeugma or syllepsis is one of the classical

figures of speech, and is often — perhaps nearly always — used to humorous effect. It is characterized by the fact that more than one meaning of a word is exploited in a sentence, although the word itself appears only once. For example:

I'll meet you in five minutes and the garden.

This sentence exploits two different meanings of the preposition “in” — one temporal and the other spatial. When one imagines meeting someone *in* a garden, one sees in one’s mind’s eye two relatively small entities physically surrounded by a larger entity, whereas when one imagines a meeting taking place *in* five minutes, one thinks of the period of time that separates two specific moments from each other. Everyone understands with no trouble that these are two very different concepts associated with the same word, and the fact that the preposition “in” is used only once in the sentence despite the wide gap between the two meanings that it’s conveying is what makes us smile when we read the sentence.

Here are a few other somewhat humorous examples of zeugmas:

Kurt was and spoke German.

The bartender gave me a wink and a drink.

She restored my painting and my faith in humanity.

I look forward to seeing you with Patrick and much joy.

In the first, the word “German” is forced to switch rapidly, in the reader’s mind, from being an adjective denoting a nationality to being a noun denoting a language.

The second zeugma involves two different aspects of the notion of *transfer* between human beings. Does one person really *give* a wink to another person? Is a wink a material object like a drink, which one person can hand another?

In the third zeugma, the speaker’s faith in humanity had disappeared and was made to come back, whereas the painting had not disappeared at all. Moreover, faith in humanity is far less palpable than a painting on one’s wall. What gives this zeugma its flavor of oddness is that one of the meanings of the verb “restore” that it depends on is “to return something that has been lost”, while the other meaning used is “to make something regain its former, more ideal state”, and although these two senses of the same word are clearly related, they are just as clearly not synonymous.

Finally, the last zeugma in our quartet plays on two sharply contrasting senses of the preposition “with”, one conjuring up the image of someone (Patrick) physically accompanying someone else (the speaker and the person being addressed), and the other communicating the emotional flavor (great pleasure) of a mental process (the anticipation of a reunion). As in the other cases, the zeugmatic use of “with” brings out the wide gap between two senses of one word, and to experience this distinction in such a crisp fashion is thought-provoking. We thus see that any well-designed zeugma will, by its very nature, automatically highlight certain semantic subtleties of the word (or phrase) around which it is built.

For example, what does the word “book” mean? One would at first tend to say that it designates an object made of printed sheets of paper bound together in some fashion, and having a cover (and so forth and so on). This is often correct, but the following zeugma brings out a different sense of the word:

The book was clothbound but unfortunately out of print.

This sentence reminds us that the word “book” also denotes a more abstract concept — namely, the set of all copies available in stores or warehouses. Are we thus in the presence of *one* concept, or of *two*? And when someone says, “I’m translating this book into English”, are they using a third sense of the word? How many subtly distinct concepts secretly coexist in the innocent word “book”? It would be an instructive exercise to try to construct more zeugmas based on yet other senses of the word “book”, but we have other goals here, so we will leave that challenge to our readers.

Instead, let’s look at a somewhat more complex zeugma:

When they grew up, neither of those bullies ever had to pay  
for all the mean things that they did as, and to, younger kids.

Here the trickiness is in the strange, lightning-fast shifting of meaning of “younger kids” as a function of whether it is seen as part of the phrase “things that they did as younger kids” or as part of the phrase “things that they did to younger kids”, since in the first case the *younger kids* are the ex-bullies themselves (or rather, the bullies that they once were), while in the latter case the *younger kids* are their victims.

### Some Revealing Zeugmas

Although the zeugmas we’ve exhibited above are mostly quite amusing, it’s not for entertainment but for enlightenment that we’ve brought up the topic. And so let’s take a look at some cases that raise more serious issues.

“You are always welcome in my home,” he said in English and all sincerity.

This zeugma is clearly built around the word “in”, and the natural question here is whether we are dealing with *one* sense or *two* senses of the word. In a respectable dictionary, these two meanings would probably have distinct subentries. However, what about the following sentence?

“You are no longer welcome in my home,” he said in anger and all sincerity.

Are the two meanings of “in” here exactly the same? Perhaps — after all, they both apply to the mental states of a single person; but then again perhaps not — after all, one could replace “in anger” by “in an outburst of anger” but certainly one could not

say “in an outburst of sincerity”. So it’s rather tricky. As a matter of fact, it would be impossible to give a definitive judgment on this issue. Indeed, we chose this example precisely because it brings out certain subtle nuances of the concept *in*. How does one recognize those situations that match the English word “in”? To put it another way, how does one recognize *in*-situations? What do all *in*-situations have in common, and how do some of them differ from others, and why would it be next to impossible to make a precise and sharp classification of all the types of *in*-situation?

Let’s shift our attention from a preposition to a verb. Does the following sentence strike you as innocuous and perfectly acceptable (*i.e.*, nonzeugmatic), or does it grate on your ears (thus it would be a zeugma)?

I’m going to brush my teeth and my hair.

Are the two types of brushing really just one thing deep down, or are they worlds apart? We might gain perspective on this question by looking at a similar example in another language. In Italian, one might easily and comfortably say:

Voglio lavarmi la faccia e i denti.

(In a fairly literal translation, this says, “I want to wash my face and my teeth.”) The fact that Italian speakers say things this way sheds light on how they perceive the world — namely, it shows that they perceive the act of washing one’s face and the act of brushing one’s teeth as belonging to the same category (both are types of *washing*), and thus they are, in some sense, “the same act”.

On the other hand, to speakers of English, brushing one’s teeth is not a kind of washing (washing usually involves soap of some sort, and most people would hesitate to refer to toothpaste as “soap”, though the two have much in common), so the sentence sounds zeugmatic (that is, its double application of the same word makes us smile). As for French, although occasionally one will hear “se laver les dents” (“to wash one’s teeth”), it is more common to say (and hear) “se brosser les dents” (“to brush one’s teeth”). The latter seems more natural to French speakers than the former. And thus we see that a phrase (“to wash one’s teeth and one’s face”) can be very zeugmatic in one language (English), can have a faintly zeugmatic flavor in another language (French), and can be totally nonzeugmatic in a third language (Italian).

The preceding example shows how a zeugma can reveal a conceptual division that speakers of language A find blatantly obvious, while to speakers of language B it is difficult to spot. For instance, in English, we can say without any sense of oddness:

Sometimes I go to work by car, and other times on foot.

In German or Russian, however, these two forms of locomotion call for different verbs. When one takes a vehicle to arrive at one’s destination, then the verb “fahren” is used in German, whereas when one goes somewhere on foot, then the verb “gehen” is used.



In Russian it's trickier yet, because not only is there a distinction between *going in a vehicle* and *going on foot*, but also the choice of verb depends on whether this kind of motion is undertaken frequently or just one time. Thus a completely innocuous-seeming verb in English breaks up into several different verbs in Russian. In other words, what to English speakers seems to be a monolithic concept splits into four distinct concepts to Russian speakers.

Let's take another very simple sentence in English:

The boy and the dog were eating bread.

This sentence is nonzeugmatic in English; that is, it simply *works*, sounding neither strange nor humorous to the English-speaking ear. On the other hand, it sounds wrong in German, because different verbs apply to animal and human ingestion — “fressen” for the beasts, and “essen” for humans. In other words, German speakers split up what to us anglophones is the monolithic concept of *eating*, breaking it into two varieties, according to the type of creature that is carrying out the act.

### The “Natural” Conceptual Distinctions Provided by Each Language

These examples might inspire someone to imagine a language (and culture) that has no verb that applies both to men and to women. Thus it would have one verb that would apply to eating acts by *men* and a different one that would apply to eating acts by *women* — say, “to wolf down” for men and “to fox down” for women, as in “Petunia foxed down her sandwich with relish, gusto, and pickles”. Speakers of this hypothetical language would find it jolting to learn that in English one can say, “My husband and I enjoy eating the same things” or “A girl and a boy were walking down the sidewalk.” To them, such sentences would sound nonsensical. A language like this may strike you as ludicrous, but many languages do make just such gender-based lexical distinctions.

For instance, in French there is a clear-cut distinction between enjoyment partaken of by men and enjoyment partaken of by women, which shows up in, among other venues, the standard adjective meaning “happy”: whereas a joyous man or boy will be “heureux”, a joyous woman or girl will be “heureuse”. And thus, a *curieux* French male might well wonder what it feels like to be *heureuse* — but he would do so in vain! A man simply cannot be *heureuse*! In like manner, a *curieuse* French woman might wonder what it feels like to be *heureux* — but her efforts, no matter how valiant, would be doomed to failure. A Venusian might as well try to imagine what it feels like to be Martian!

Does all this sound far-fetched to you? Well, consider that there is a famous Russian poem centered on what the poet, a man named Il'ya L'vovich Selvinsky, considered a very strange fact: namely, that every act of his lover — every single one of the mundane verbs that described her actions — was graced, when in the past tense, by a feminine ending (often the syllables or bisyllables “la”, “ala”, or “yala”). The poet describes various completely ordinary actions on her part (walking, eating, etc.), and then expresses wonderment at his own feeling of disorientation, since he, being a male,

has never once performed a single one of these “uniquely feminine” acts, nor experienced a single one of these “uniquely feminine” sensations, and, alas, will never be able to do so. In making such observations, is Selvinsky expressing something deep, or is he merely playing with words?

One can easily enough imagine a language that, with a panoply of verbs, distinguishes between a vast number of different ways of eating — the eating of a famished boy, of a high-society lady, of a pig, a horse, a rabbit, a shark, a catfish, an eagle, a hummingbird, and so forth and so on. Such a fine-grained breakup of a concept that seems to *us* completely monolithic is perfectly imaginable, because we understand that there are genuine differences between these creatures’ ways of ingesting food (indeed, if there weren’t any, we would not have written “genuine differences”). Each language has the right and the responsibility to decide where it wishes to draw distinctions in the zone of semantic space that includes all of these distinct activities. After all, there are not, on earth (and never have been, and never will be) two creatures that eat in an exactly identical fashion, nor even two different moments in which a single creature eats in exactly the same manner, down to the tiniest detail.

Every act is unique, and yet there are resemblances between certain acts, and it is precisely these resemblances that give a language the opportunity to describe them all by the same label; and when a language chooses to do so, that fact creates “families” of actions. This is a subtle challenge to which every language reacts in its own fashion, but once this has been done, each group of people who share a common native language accepts as completely natural and self-evident the specific breakdown of concepts handed to them by their language. On the other hand, the conceptual distinctions that are part and parcel of *other* languages may strike them as artificial, pointlessly finicky, even incomprehensible or stupid, unless they find some interest in the subtleties of such distinctions, which may then make them see their own set of concepts in a fresh light.

### Wordplay with the Word “Play”

The verb “to play” affords us a delightful sampler of zeugmas, or else, depending on a person’s native language and on their own personal way of perceiving the actions involved, non-zeugmas. For example:

Edmond plays basketball and soccer.

This sentence, on first sight, might seem about as natural as they come, and very far from zeugmaticity, and yet the two activities involved, although they both belong to the category of *sports*, are different in numerous ways from each other. For instance, one involves a ball that is primarily in contact with the feet (and on occasion with the head), while the other involves a ball that is primarily in contact with the hands (and virtually never with the head). Certain speakers of English might therefore hear a trace of strangeness, albeit only very slight, in the application of the same verb to two rather disparate activities.

If *essen* (which is what people do when they eat food) and *fressen* (which is what, say, pigs and rabbits do with their food) are seen by German speakers as activities that belong to two different categories, then there is nothing to keep us from imagining a language in which one would say:

Edmondus snuoiqs basketballum pluss iggfruds soccerum.

The speakers of this hypothetical language would see the actions of basketball players — or rather, of basketball *snuoiqers* — as being just as different from the actions of soccer *iggfruders* as the sounds “snuoiq” and “iggfrud” are different from each other.

If this example’s zeugmaticity seems too weak, then we can try another avenue of approach to the same issue:

Sylvia plays tennis, Monopoly, and violin.

This sentence involves a musical instrument and two types of game that are much more different from each other than are basketball and soccer. If one tried to measure the distances between these three concepts by asking people to estimate them, it’s likely that most people would place *violin* quite a long ways from *tennis* and *Monopoly*, and those two games, though not extremely near each other, would be much closer than either of them is to *violin*. And finally, not too surprisingly, this matches the collective choice of Italian speakers, who would translate the above sentence as follows:

Sylvia *gioca* al tennis e a Monopoly, e *suona* il violino.

It would be unthinkable, in Italian, for anyone to *play* (in the sense of *giocare*) a musical instrument; the mere suggestion is enough to make an Italian smile. The kind of scene that such a phrase would conjure up is that of people playing catch with a Stradivarius, for instance. While it is natural for English and French speakers to see violin-playing as belonging to the same category as soccer-playing and basketball-playing, the idea would seem downright silly to Italian speakers.

In French, the verb *jouer* is used both for musical instruments and for sports, but it is followed by different prepositions in the two cases. Thus one plays *at* a sport but one plays *of* a musical instrument. Does this syntactic convention split the concept of *jouer* into two quite clear and distinct sub-meanings? In English, there is no similar syntactic convention that would create a mental division of the verb “to play” into two separate pieces; rather, it simply feels monolithic.

### Playing Music and Sports in Chinese

The distinction made in Italian between “*giocare*” (for sports) and “*suonare*” (for musical instruments) might seem a bit precious. After all, not only English but plenty of other languages are happy to use exactly the same verb for both kinds of activities —

thus French uses “jouer”, German uses “spielen”, Russian uses “играть”, and so on. What about Chinese?

It turns out that Mandarin speakers are considerably more finicky in this matter than Italian speakers: they linguistically perceive four broad types of musical instruments, each type meriting its own special verb. Thus for stringed instruments there is the verb “拉” (pronounced “lā”), meaning roughly “to pull”, while for wind instruments one says “吹” (“chuī”), which means “to blow”. Then for instruments such as the guitar, whose strings are plucked by the fingers, or the piano, whose keys are pushed by the fingers, the verb is “弹” (“tán”) — and finally, for drums, which are banged, what one says is “打” (“dǎ”).

Curiously enough, it’s possible to apply the verb that means “to play” (as in “play with a toy”) to any musical instrument (it is “玩”, pronounced “wán”); unfortunately, however, the meaning is not what an English speaker might expect: it’s essentially the idea of *fussing around* with the instrument in question, and moreover this usage of “玩” is extremely informal, indeed slangy.

One might naturally wonder how a Chinese speaker would ask a more generic question, such as “How many instruments does Baofen play?” But the best translations of this perfectly natural English sentence elegantly bypass the problem by making use of very broad verbs such as “学习” (“xuéxí”) or “会” (“huì”), which mean, respectively, “to study” and “to be able; to know”, and which have no particular connection with music. In short, there is no general verb in Mandarin that corresponds to the *musical* notion of playing, even though to us English speakers the concept seems totally logical, even inevitable; but the fact is that speakers of Chinese have no awareness of this lacuna in their lexicon, no matter how blatant it might seem to us.

Well, all right, then. But what about playing games and sports — surely there is just one verb in Chinese for this monolithic concept? To begin with, one does not, in Mandarin, play board games and sports with the same verb. For chess, one engages in the activity of “下” (“xià”), which one does not do with any kind of ball. And for a sport that uses a ball, it all depends on the kind of ball involved. For basketball, it’s “打” (“dǎ”), the verb that applies to playing a drum (the connection may seem a bit strained to a non-Chinese), whereas for soccer it’s “踢” (“tī”), which means “to kick”. Thus one might say, “I prefer kicking soccer to beating basketball.” Once again we see that in a domain that strikes an English speaker as monolithic — everything is *played*, and that’s all there is to it! — distinctions are not just rife but necessary in Chinese.

For English speakers, despite our use of the single verb “to play”, it’s not terribly hard to see that this verb conflates two activities that are quite different — namely, making rhythmic noises and having fun — and that the conceptual union thus created is not inevitable, and might even be seen as being rather arbitrary. On the other hand, *within* each of these two domains, it’s harder to see a lack of natural unity. If someone were to ask us if *playing dolls*, *playing chess*, and *playing soccer* are all really “the same activity”, we could of course point out differences, but to focus on such fine distinctions would seem quite nitpicky. And when we learn that in Mandarin, *playing soccer* and *playing basketball* require different verbs, it is likely to strike us as really overdoing things,

rather as if some exotic tongue insisted on using two different verbs to say “to drink”, depending on whether it involved drinking *white* wine or *red* wine. But then again, this is an important distinction for wine-lovers, so it’s conceivable that some of them would very much like the idea of having two such verbs.

## Zeugmas and Concepts

Our brief excursion to Zeugmland will come to a climax in the following bold prediction:

You will enjoy this zeugma as much as a piece of chocolate or of music.

This sentence has a couple of zeugmatic aspects. Firstly, it plays on two senses of the noun “piece”. In some readers recognition of this contrast will evoke a smile, even though there’s no denying that both usages of the word are completely standard. Secondly, it plays on three senses of the verb “enjoy” — one involving a gustatory experience, another involving an auditory experience, and yet another involving the savoring of a linguistic subtlety. Each reader will of course have a personal feeling for how large the distinction between these three senses of the word is.

Aside from making us smile, zeugmas offer us the chance to reflect on the hidden structure behind the scenes of a word or phrase — that is, on the concept associated with the lexical item, or more precisely, on the *set of concepts* associated with it — and since most words could potentially be used to form a zeugma (including very simple-seeming words such as “go”, as we saw above in the discussion of German and Russian), the phenomenon necessarily increases our sensitivity to the miracle of the human brain’s ability to spontaneously assign just about anything it encounters to some previously known category. After all, despite the inevitable and undefinable blurriness of the “edges” of each one of our categories, and despite the enormous number of categories, our brains manage to carry out such assignments in a tiny fraction of a second and in a manner of which we are totally unaware.

## The Nature of Categorization

The spontaneous categorizations that are continually made by and in our brains, and that are deeply influenced not just by the language we are speaking but also by our era, our culture, and our current frame of mind, are quite different from the standard image, according to which categorization is the placing of various entities surrounding us into preexistent and sharply-defined mental categories, somewhat as one sorts items of clothing into the different drawers of a chest of drawers. Just as one can easily stick one’s shirts into a physical drawer labeled “shirts”, so one would easily assign dogs to the mental drawer labeled “dog”, cats to the nearby mental drawer labeled “cat”, and so forth. Every entity in the world would fit intrinsically into one specific mental “box” or “category”, and this would be the mental structure to which all the different entities