

Part VI

Concepts and Approaches: Space and Time

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Linguistic Patterns of Space and Time Vocabulary

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38.1 Introduction

Linguists have long observed that the dominant metaphors for time, in the vast majority of languages, are spatial ones. Unfortunately, it still remains the case that we do not have deep, solid semantic analyses of any domain, or any metaphoric structure, in nearly as many languages as those for which we have reliable data on word order, or consonant inventories. Even a good grammar is not usually sufficient to give us all we need to discuss a language's system of spatiotemporal metaphors. However, compared to other domains of meaning, spatiotemporal metaphor has been systematically examined in a wide variety of unrelated languages, including both languages using a range of different spatial metaphors and languages with very different semantic systems for expressing the source domain of space. We are helped (thanks in great part to Stephen Levinson's group at the Max Planck Institute at Nijmegen) by the fact that the cross-linguistic typology of spatial expressions (the Source Domain for spatiotemporal metaphor) is remarkably well examined, and also by the fact that spatiotemporal metaphor has been a major subject of interest to linguists recently, as well as to workers in cognitive science, gesture studies, and other related areas.

This class of metaphors are therefore of very special interest to anyone working on semantic typology and universals, as well as to cognitive linguistics and cognitive science. This chapter gives a summary and synthesis of the linguistic side of the situation: what range of patterns of spatiotemporal metaphor do we observe in languages, and how do they correlate with linguistic spatial systems? In the next chapter, a broader range of evidence will be examined, showing how laboratory and field work, and gesture studies, bear on these linguistic analyses.

38.2 Patterns of Language Change and Polysemy

One of the oldest observations in metaphor studies is that cross-linguistically, the single primary *historical* source for temporal vocabulary is spatial vocabulary. This is not just a tendency, but an overwhelmingly dominant one. The English words *before* and *after* once literally meant ‘in front of’ and ‘in back of,’ a pattern repeated again and again across the world’s languages. And in fact, *before* can still mean ‘in front of’ in some restricted frames, e.g. *before my very eyes* or *before the judge*. This is also typical, since historical change normally proceeds via patterns of polysemy – in this case, the same word referring to spatial and temporal senses.

Crucially, the inverse direction of change is not observed: we do not find lots of linguistically conventionalized spatial phrases with origins in the semantic domain of time (instead their origins are in areas such as physical bodily structure, e.g. *in back of* includes the word *back*). This striking asymmetry is what we would expect of metaphoric mappings, -which are known to be asymmetric in structure. As Cognitive Metaphor Theory has demonstrated, a metaphor is not a two-way comparison, but a cognitive framing of one domain or frame in terms of another (Lakoff and Johnson 1980a, 1999). The metaphor ANGER IS HEAT AND PRESSURE OF A CONTAINED LIQUID, for example, maps our understanding of the metaphoric Source frame of Heat and Pressure onto the Target frame of Anger, including inferences such as the possibility of an explosion, which maps onto the possibility of a socially dangerous sudden rage (Lakoff 1987). This metaphor does *not* in the same way produce new inferences about Heat and Pressure based on our understanding of Anger.

That metaphors are a basic component of historical linguistic change is well recognized (see Sweetser 1990 and its references). This is in itself a matter of major interest for semantics, since cognitive semantics (unlike formal logical semantic models) has developed a theory of meaning which includes and motivates the analysis of metaphoric polysemy patterns and meaning-change patterns. In this case, the overwhelming cross-cultural dominance of spatial metaphors for time suggests strong asymmetric cognitive bases in experience.

But specifically, how are spatial semantic frames mapped onto temporal ones? What patterns are observed, and what variation is found?

38.3 The Range of Mappings

38.3.1 Moving-Time and Moving Ego

First of all, many languages all around the world exhibit what we might call a family of TIME IS (RELATIVE MOTION IN) SPACE metaphors (Lakoff and Johnson 1980a, 1999). English abounds with metaphorical expressions of

this kind, which may be divided into two subtypes of space–time mapping. The first mapping (often known in the literature as *Moving Ego*) takes the viewpoint of a person moving along a temporal ‘landscape,’ as seen in expressions like *She had **left** midterm time **behind** her, and was **coming up on** spring break*. The second mapping, *Moving Time*, takes the viewpoint of a stationary observer or Ego, toward whom time moves from in front, as seen in *Spring break was fast **approaching***. Ego is here understood to be some experiencer with a *viewpoint* on the situation; that viewpoint includes spatial experience of a location as Here and of front–back orientation, and also temporal experience of a Present time and its relationship to Past and Future times.

Many other expressions are compatible with both mappings; if we say that *Spring break is **a long way off***, we might invoke the *Moving Ego* frame to imagine ourselves (or some Ego) traveling over the temporal landscape toward the spring break, or we may invoke the *Moving Time* mapping to imagine spring break moving toward us from its currently distant position. This makes us note some shared aspects of these two metaphors’ mappings, namely TEMPORAL SEQUENCE IS A LINEAR SPATIAL PATH, and AMOUNT OF TIME BETWEEN EVENTS IS PHYSICAL DISTANCE BETWEEN LOCATIONS. But in other respects we must see different basic mappings: for the *Moving Ego* class of metaphors, Times are seen as Locations, and experiencing a time is being located at a location. This seems to inherit a basic structure from Lakoff and Johnson’s much-discussed general STATES ARE LOCATIONS. That is, Times are understood to be a subclass of States, and Ego to be an experiencer of temporal states as well as other ones. But in the *Moving Time* mappings, things are somewhat more complicated: it is the Times which move past Ego’s (presumably fixed) location. Note that nowhere are Time and Ego understood metaphorically as two moving objects, moving (for example) in opposite directions; this is understandable, perhaps even predictable from the fact that linguistic spatial systems appear universally to treat *spatial* scenes primarily in terms of Figure–Ground relations; the located or moving entity is a Figure, relative to a stable Ground or Reference Point (cf. Talmy 2000a, 2000b, Levinson 2003); the same scene might thus be described as *The bicycle (Figure) is behind the car (Ground)* or *The car is in front of the bicycle*. A Location or Motion Scene understanding of time thus needs to conceptualize either Ego or Time as Figure, and the other as Ground. This means that in any given conceptualization, Time and Ego cannot both be construed as moving.

As Moore (2006, 2011, 2014) has argued in detail for Wolof as well as English, and Núñez and Sweetser (2006) concur, we should not really be talking only about *Moving Ego* or *Moving Time* – an even more basic question is whether the Reference Point (or Ground, in the spatial scenario) is Ego or Time. The *Moving Time* metaphors cited above are Ego-based, in the sense that *Spring break is approaching* means specifically that

Ego is being ‘approached’ by (i.e. will soon experience) spring break. There are also Time-based front-back Moving Time metaphors, such as the sequential relationship between times (*Monday is always two days ahead of Wednesday*) – here, although there is always some viewer, it is only the times which are metaphorically spatially related to each other: EARLIER TIMES ARE AHEAD OF LATER TIMES. This is different from seeing times as moving toward Ego, passing Ego, and then receding behind Ego (*Monday will be here soon, Sunday is passing swiftly, Saturday has gone past*). Although both involve Moving Time, this second one is TIMES ARE OBJECTS GOING PAST EGO and FUTURE IS IN FRONT OF EGO, PAST IS IN BACK OF EGO as well as EARLIER TIMES ARE AHEAD OF LATER. Both are distinct from Moving Ego metaphors, where Ego moves along a path in a temporal landscape: *We’re getting close to exam time, We’ve left midterms behind us*, which involve sub-metaphors TIMES ARE LOCATIONS ALONG A PATH; EGO IS A MOVER ON THE PATH; PAST IS BEHIND EGO; FUTURE IS IN FRONT OF EGO; and TIMES ARE LINEARLY ARRANGED LOCATIONS.

The contrast between Ego-based and Time-based metaphors, it should be noted, fits into a larger contrast between *deictic* and *non-deictic* linguistic models of Time. An Ego-based model necessarily has an Ego and an Ego’s Now as deictic centers of the spatial and the temporal frames mapped. Tense systems are another linguistic system which necessarily depend on some Now as a deictic center, relative to which Past and Future are earlier and later; so do expressions like *tomorrow* and *next year*. Other linguistic expressions, such as *Tuesday* or *June 1925*, or *before* and *after*, do not necessarily involve any Ego’s Now as a temporal deictic center: describing the review session as *before* the exam does not tell us whether these two events are seen as Past or Future.

Thus, there are at least three major classes of time metaphors in English; and only two of these have been the focus of experimental investigation (to be discussed in the next chapter). All three are represented gesturally, however; the side-to-side timeline used by English speakers to show relative temporal sequence of events does not incorporate any placement of the gesturing self as Ego or Now, and therefore can be used to represent sequences of events which are all in the past, all in the future, or both. The front-back gestural timeline (in both English and ASL) necessarily incorporates Ego’s Now as the location right in front of the Speaker; so the front half of the timeline is necessarily Future, and the behind-Ego portion is Past. In the next chapter, the relationship between linguistic and gestural timelines will be discussed in more detail.

All of the metaphors so far discussed are, as most investigators agree, Primary Metaphors stemming from very early and pervasive Primary Scenes in experience (as defined by Grady 1997a, Johnson 1997, Grady and Johnson 2002). It is impossible to move along a path, or to watch objects going past you, without experiencing the spatial sequence of locations as *correlated* with the temporal sequence of moments when you or the

moving object is at different locations. And both frames are understood as involving single-dimensional linear scales; a person moving along a path cannot get from point A to point D without traversing intermediate locations B and C, nor can an Ego now experiencing June 1 possibly experience June 4 without living through June 2 and 3. So there are parallel inferential structures in the two domains, readily mapped. Specifically, for an Ego moving forwards on a path, Locations ahead of Ego will be experienced at Future times, and Locations behind Ego are ones where Ego has already been at Past times: a very basic experiential correlation between Ego's front-back axis and Ego's experience of Past and Future. This might lead us to think that this family of space-time metaphors would be very common and basic indeed – and such is certainly the case; ~~indeed~~, English space-time metaphor patterns turn out to be a relatively unremarkable. However, they are not the only possibilities, though they are the dominant ones cross-linguistically.

38.3.2 What about Vertical Space?

Mandarin Chinese, like English, construes the Past as behind Ego and the Future as in front of Ego; Yu (1998, 2012) described both the treatment of Past as behind a moving Ego, and future as being in front of a moving Ego, as well as the Time-based model where earlier times are in front of later ones. However, Mandarin speakers also regularly construe the Past as above Ego and the Future as below Ego: the Chinese phrases for 'last week' and 'next week' translate into English as UP- (or ABOVE-)WEEK and DOWN- (or BELOW-) WEEK respectively. Metaphors vary with the time-unit; 'last year' and 'next year' are FRONT YEAR and BACK YEAR (our standard Time-based metaphor, where EARLIER TIMES ARE AHEAD OF LATER TIMES).

Vertical metaphors for time are not unknown in other languages, though they are not as pervasive as the ones in Mandarin. French, for example, refers to what English historians call Late Antiquity (the late Roman and pre-medieval era) as *basse Antiquité* 'low Antiquity'; and French *haut Moyen Age* (literally 'high Middle Ages') means 'early Middle Ages.'

There are real correlations potentially underlying these metaphors – among them, the fact that in Mandarin, historically earlier writing systems were primarily from top to bottom rather than from left to right (so higher characters were earlier in the reader's experience of the text) and that water flows downwards (an important motif in Chinese philosophy). Still, they do not seem to be as salient as correlations in early childhood human experience such as those relating motion along a path to temporal sequence, which are experienced any time there is any motion in the child's environment. This may explain why the back-front spatial metaphors are so very much more pervasive across the world's languages.

38.3.3 When the Future is behind You

We have seen that there is an extremely broad tendency for humans to follow the mappings *THE PAST IS BEHIND EGO* and *THE FUTURE IS IN FRONT OF EGO* – that is, to map past times onto the local path behind the Moving Ego, and future times onto the area of a local path in front of Moving Ego. These mappings have a universally accessible correlational basis; and they also carry *inferences* that seem self-evidently useful. For a moving Ego on a path, we can infer that Ego will at a Future time be located at a location further ahead, and that Ego was located in the Past at locations which are (locally) behind Ego on the Path. Thus, we can infer that Future times will become the Ego's Now and that Past times have been Now, and will not be Now again. (The mappings simply do not take into account the possibility of walking the opposite direction along a path, which makes sense since – barring science fiction scenarios – our experience of Time is entirely unidirectional.)

However, this is by no means the only possible option. As Núñez and Sweetser (2006) point out, the Aymara (and probably other neighboring high-Andean languages) appear to have a static time metaphor, where *FUTURE IS BEHIND EGO* and *PAST IS IN FRONT OF EGO*. At least part of the motivation for the Aymara mapping appears to be the very common (and Primary) metaphor *KNOWLEDGE IS VISION* or *KNOWING IS SEEING*. We can see what is in front of us, not what is in back of us; and the Past is at least potentially Known, the Future is necessarily Unknown, hence mapped onto the area behind Ego.

Note that this static metaphor has an extremely different inferential structure from the motion metaphors for time. The fact that something is currently in front of or in back of a *static* person does not tell us much about future or past co-location scenarios. If I am standing in a classroom, facing the class and the wall is behind them, that does not mean that I am going to be located at that back wall in the future; and if I turn to face the blackboard and not the class, that does not allow a viewer to infer that I was previously located at the back wall which is now behind me. So another Primary Metaphor, *KNOWLEDGE IS VISION*, combines with moving and static time metaphors differently. We get *FUTURE IS BEHIND EGO* in a static construal of Ego in a Time 'landscape' (the area behind a static Ego is *not visible*), but a *FUTURE IS AHEAD OF EGO* mapping is beautifully coherent with a construal where Ego moves dynamically along a temporal 'path' (since the part of the path ahead of a moving Ego, at least around the next curve, is not visible yet, or still *unseen*).

We need to add here that Moore (2014) has thoroughly examined a range of earlier scholarly claims of languages in Europe and Asia where '*PAST IS IN FRONT*,' and shown that they generally reduce to *EARLIER TIMES/EVENTS ARE IN FRONT OF LATER TIMES/EVENTS* (a time-based metaphor) rather than

to the ego-based PAST IS IN FRONT OF EGO. So Aymara and its neighbors are truly unusual in the world's languages.

38.3.4 Absolute Spatial Languages and Time

In relative spatial languages, spatial reference to relative location pervasively involves some projection of Ego's directional coordinates; for example, English speakers will say *My purse is to the left of the laptop*, or *The ball is in front of the tree*. The first of these usages needs an interpreter to project some viewer's left-right axis onto the scenario of the computer and the purse; the second, even more complex, involves a construal of the tree as a person facing the viewer, so that a ball between the viewer and the tree is in front of the tree. Relative spatial languages are far more common cross-linguistically than Absolute spatial languages (Levinson 2003), in which spatial location may be established primarily in terms of Geocentric structures (*my laptop is east of my purse*) or other geographic features (*you have an ant on your 'upriver' leg*). We have noted that the cross-linguistically dominant spatial models of time are all relative spatial ones: times are seen as above or below Ego, in front of or in back of Ego or other Times. Field and experimental work with relative spatial languages will be discussed in the next chapter. But crucially, a language cannot exploit spatial systems which it does not have, in building temporal language. Absolute spatial languages generally have egocentric deictic systems ('here' and 'there' relative to Speaker and/or Addressee), but not left-right or front-back egocentric linguistic expressions. So the kinds of temporal models we have seen as characteristic of relative spatial languages would not be possible in absolute languages. At present, it is not clear that there are any linguistic temporal systems of metaphor based entirely on absolute spatial language, although (as we shall see in the next chapter) speakers of absolute spatial languages do seem to construe time in absolute spatial terms, judging by other metrics such as gesture and spatial arrangement tasks.

38.4 Writing Systems and Time

We mentioned above that writing systems do appear to influence metaphors for time; the fact that Chinese has vertical metaphors in particular could be motivated by the vertical writing direction dominant in earlier Chinese. However, an added puzzle arises here. Chinese is now written primarily left-to-right (and of course the sequence of left-right lines are read from the top down), as are European languages. Arabic and Hebrew are written from right to left. And yet no language seems, anywhere, to have a basic or even systematic left-right linguistic metaphor for temporal structure. We never find words for 'right' and 'left' coming to mean 'after'

and ‘before’ (or the other way round, for Semitic languages) – even though visual scenes are certainly interpreted this way – for example, an English speaker reading a comic interprets panel A as representing an event *before* the event in Panel B, precisely if/because panel A is *to the left of* panel B. And, when English speakers gesture along a side-to-side timeline, they gesture left-to-right.

One possible simple reason for this linguistic gap, proposed by Dancygier and Sweetser (2014), is that we do not in fact conceptualize the side-to-side timeline, or our left–right writing and comic strip layouts, as primarily being *from our (the reader/gesturer’s) right to our left*, but rather as *forwards* motion of a virtual or literal trajector (gaze, gesturing hand) along *its trajectory*. And this fits in reading very nicely with all the very pervasive back–front time metaphors which are so dominant in many languages. It is not that the writing system is the primary motivation for these metaphors; as we said earlier, motion along a path is the primary experiential motivation. But once that is there, it is easy to see how the writing system’s structure can be neatly incorporated into the front–back structure of the time metaphors. Our gaze or our hand moves along a trajectory, and it will reach farther-right locations later than farther-left ones; hence any location to the left of another is ‘forwards’ along this trajectory, and a location to the right of another is ‘farther back.’

38.5 Conclusions

The linguistic data, therefore, seems to reflect a great many cognitive and cultural factors. The following generalizations from cross-linguistic comparison do, however, hold up. First, since the world’s languages are dominantly relative-spatial rather than absolute-spatial, time metaphors are also dominantly relative-spatial metaphors, involving Ego and Time as some combination of Figure and Ground. Second, within that range, front–back metaphors dominate over up–down ones, which may be primarily based in writing system structures and lack Primary Metaphor status. And this is very likely because of Primary Scene correlations which make these metaphors easily accessible cognitively. Third, it is motion metaphors rather than static ones which dominate (no surprise given Lakoff and Johnson’s more general concepts of STATES ARE LOCATIONS and CHANGE IS MOTION); and other metaphors such as KNOWLEDGE IS VISION interact differently with motion metaphors than with static ones. And fourth, writing systems may influence spatial metaphors for time; but in order to understand their influence on the linguistic metaphors, we may need to understand how the writing system’s structure is itself metaphorically construed as motion.

The next big set of questions are of course (1) what are the cognitive bases for the wide range of less dominant spatial understandings of time

and (2) to what extent are these spatial understandings linguistically manifested (as opposed to gesturally or in physical space, for example)? Field and lab work have investigated some relevant languages in detail, and the next chapter will lay this out. But a great deal of complex metaphoric structure can be analyzed in the linguistic patterns themselves. We can still hope for much more cross-linguistic data on polysemy and historical change. But at least in this domain, some major generalizations have emerged.

As was mentioned earlier, it would be extremely hard even to talk about (much less analyze) these generalizations about semantic systems without the resources of cognitive linguistics. We have other reasons to believe that inter-frame metaphoric mappings, based ultimately on experiential correlations, are generally crucial to human cognition and language. These frameworks allow us to lay out the structures of spatial metaphors for time in a systematic way, and compare them in detail, as well as examine motivations for the dominance of some models over others cross-linguistically.

Spatial metaphors for time have interested cognitive scientists and cognitive linguists partly because they are one example of the ways in which humans apparently ‘bootstrap’ their abstract concepts on concrete aspects of experience. And it does seem clear that it would be impossible for any human to experience, in particular, *motion* in space without experiencing time; the two domains are inextricably correlated. Yet the observed patterns in spatiotemporal metaphors are not as simple as in the classic MORE IS UP, LESS IS DOWN, one of a few apparently actually universal metaphors, and plausibly hypothesized to be based on the experience of rising vertical level which correlates with adding more liquid to a container or more objects to a vertical stack. We see a range of preferred patterns, but nothing as fixed as MORE IS UP or the perhaps almost equally universal MORE IS LARGER (a greater quantity occupies more space). And we are still working on understanding the experiential motivations involved in spatiotemporal metaphors; it should be noted that just a couple of decades ago, some of these linguistic patterns had not yet been studied at all. And to what extent do culturally shaped aspects of physical experience help set the options for choices between different experiential motivations for metaphors? We know that Absolute spatial language speakers not only talk about space differently, but carry out spatial cognition tasks differently (Levinson 2003); although the motor experience of walking on a path is presumably shared, construal of spatial relations and navigation tasks are different.

Within the larger universe of meaning, it is hard to say how typical or atypical this area of the metaphor map is. There are overall apparent patterns – such as that Target frames are less *intersubjectively accessible* than Source frames; this seems a more sustainable claim than that they are always more physically concrete (see Dancygier and Sweetser 2014),

since many metaphors map abstract social frames onto other abstract frames (e.g. A NATION IS A FAMILY) or concrete ones onto concrete ones. But we just do not have enough data on metaphor systems outside of European languages and a few other well-documented ones such as Chinese, Japanese, or (to a lesser extent) Arabic. And even in these relatively documented languages, we lack fully laid-out analyses of metaphors for Self, Action, Relationship, Morality, Social Structure, and the wide range of cognitive and cultural domains which are typically construed metaphorically. Do these domains also have a few major dominant metaphoric patterns, and a few other salient ones with different motivations? Or is there wider and more scattered variation, some of it perhaps based on culturally distinct experiences of *both* source and target frames? We are still really just starting the work on this area of cognitive linguistics.