

Abstract Motion
 Ronald W. Langacker
 University of California, San Diego

A well-known fact of language change is that verbs meaning 'go' often evolve into markers of future tense. The French construction illustrated in (1) and its English translation are among the numerous examples that could be cited (cf. Givón 1973).

(1) Il va finir bientôt. 'He is going to finish soon.'

This semantic shift is commonly attributed to spatial metaphor, wherein the meaning 'motion away from the speaker' is transferred from the spatial to the temporal domain. While accepting the basic validity of this analysis, I would nevertheless argue that as it stands it is insufficiently precise. For example, who should we take to be the mover, the speaker or the subject? In what sense is it meaningful to speak of 'motion through time'? My objective is to answer these questions, and to show how the shift from 'go' to 'future' is related to a variety of other phenomena. I will argue that the shift receives a natural and explicit characterization granted a number of independently motivated concepts and analyses available within the framework of cognitive grammar.¹

Basic Concepts and Assumptions

My initial assumption is that meaning is properly equated with conceptualization, in a suitably broad sense of the term. Moreover, conceptualization can be analyzed at either of two levels: the phenomenological level (i.e. that of mental experience), and the level of cognitive events (i.e. neurological activity). I assume, in other words, that having a particular mental experience resides in the occurrence of some pattern of neural activation. Conceptualist semantics has thus far concerned itself primarily with the phenomenological level, as a matter of necessity. Still, the structures at this level must eventually be explicated with reference to neurological events. Though we can hardly hope to pin things down to the firing of specific neurons, we might at least hope to determine the functional architecture of those events whose occurrence could conceivably constitute a given experience.

In this spirit, I make the further (and I think quite plausible) assumption that any conception involving ordering or directionality at the experiential level implies some type of seriality at the processing level; an ordered conception necessarily incorporates the sequenced occurrence of cognitive events as one facet of its neurological implementation, and this sequencing is taken as being constitutive of the conceptual ordering. As an obvious and convenient example of an ordered conception, consider our ability to mentally recite the alphabet. The mental recitation of any individual letter must reside in the occurrence of some pattern of neural activation, which we can treat

as a single cognitive event (despite its internal complexity). It is apparent, moreover, that our knowledge of the alphabet as an ordered structure reduces to our ability to recite the letters in proper sequence. Clearly, in performing this mental exercise of running through the sequence [a > b > c > ... > x > y > z], we activate in serial fashion those cognitive events that constitute the recitation of the individual letters.

To avoid confusion, we must distinguish between the conception of time on the one hand, and the fact that conception takes place through time on the other hand. I will therefore speak of conceived time (symbolized \underline{t}) and processing time (symbolized \underline{T}), pertaining to the phenomenological and the event levels, respectively. Conceived time is time as an object of conceptualization; I conceive of time when I consult my watch, when I use a word like before, or even when I see something happen (e.g. an object falling to the ground).² By contrast, processing time is time as a medium of conceptualization: every cognitive event requires some span of processing time for its occurrence (however brief it might be), including events that constitute the atemporal conception of static situations. Despite their obvious relationship, these two sorts of time are functionally distinct and must be separated for analytical purposes.

We shall also need a convenient way of referring to the relationship between a conceptualizer and the conceptualization he entertains at a given moment. I will call this the construal relation, and adopt for it the notation in (2), where C stands for the conceptualizer, and Q for his immediate mental experience:

$$(2) \begin{bmatrix} Q \\ C \end{bmatrix} T_i$$

Formula (2) simply indicates that conceptualizer C carries out conceptualization Q at moment T_i of processing time. Using this notation, we can now offer at least a partial representation of what happens when somebody mentally recites the alphabet:

$$(3) \begin{bmatrix} a \\ C \end{bmatrix} T_1 > \begin{bmatrix} b \\ C \end{bmatrix} T_2 > \begin{bmatrix} c \\ C \end{bmatrix} T_3 > \dots > \begin{bmatrix} x \\ C \end{bmatrix} T_{24} > \begin{bmatrix} y \\ C \end{bmatrix} T_{25} > \begin{bmatrix} z \\ C \end{bmatrix} T_{26}$$

The import of (3) is that C first activates the conception of a, then that of b, and so on; C's recitation of the alphabet occupies span [T₁, T₂, T₃, ..., T₂₆] of processing time. Observe that conceived time has no intrinsic role in this mental exercise; at any one moment, C's conception is merely that of some letter of the alphabet. Though C may be aware of the passage of time, and may even pay heed to his own participation in a temporally-extended activity, neither sort of awareness inheres to the recitation task per se.

Despite its subtlety, this matter of self-awareness is rich with implications for both semantic and grammatical structure (cf.

Langacker 1985), and since it is central to our later concerns, we must find a way of dealing with it. It is helpful to start from the ideal (and possibly non-existent) situation in which the conceptualizer manifests a total lack of self-awareness: C is completely absorbed in the conception of Q, to the extent that he loses all awareness of himself, and even of the fact that he is engaging in the conceptualization process (i.e. what C conceptualizes is simply Q, and not at all C conceptualizing Q). With respect to this idealized situation, I will say that the role of C is fully subjective, whereas that of Q is objective. Full subjectivity and objectivity thus stand in polar opposition, being defined for instances involving maximal asymmetry between the roles of conceptualizer and object of conceptualization. In practice, of course, the roles are commonly mixed, as the conceptualizer himself is often an object of conceptualization. To the extent that C creeps into the conceptualization, the subjectivity of his role declines; when C indulges his notorious egocentricity, and makes himself the focus of attention within Q, the basis for the subjective/objective distinction is eroded entirely.

The alphabet once more provides convenient illustration. Formula (3) represents the situation where C is totally absorbed in mentally reciting the alphabet and loses all self-awareness; the letters of the alphabet are thus fully objective entities (as I am using that term here), while C's role is maximally subjective. Suppose, on the other hand, that C not only mentally recites the alphabet, but also consciously monitors his facility and accuracy in doing so--in this case, C conceptualizes not only the alphabet (letter by letter), but also C conceptualizing the alphabet. There are consequently two levels of conceptualization:

$$(4) \begin{array}{c} [a] \\ [C]t_1 \\ [C'] \end{array} T_1 > \begin{array}{c} [b] \\ [C]t_2 \\ [C'] \end{array} T_2 > \begin{array}{c} [c] \\ [C]t_3 \\ [C'] \end{array} T_3 > \dots > \begin{array}{c} [z] \\ [C]t_{26} \\ [C'] \end{array} T_{26}$$

Since all of (3) now functions as an object of conceptualization, it is embedded as such in a higher-order construal relation. Note that there are two conceptualizer roles, one for each level of organization: the conceptualizer's role in mentally reciting the alphabet (indicated by C), and his role in the self-monitoring of this process (indicated by C').

Because C is the object of self-observation in (4), this role is no longer a subjective one. Moreover, the processing time required for C to run through the alphabet qualifies as conceived time from the perspective of C', and is thus represented [t₁, t₂, t₃, ..., t₂₆]. Role C', by contrast, is purely subjective (provided that the conceptualizer does not add yet another layer of conceptualization by thinking about the fact that he is monitoring his recitation). Formula (4) can also be applied to the situation where C and C' are different individuals, which would be the case if C' were to imagine somebody else reciting the alphabet. The

status of C in this situation depends on whose viewpoint is considered: from the standpoint of C', C is fully objective; from his own vantage point, however, C is simply running through the alphabet (without self-awareness), and is therefore subjectively construed.

The Characterization of Verbs

I believe that fundamental grammatical classes, including nouns and verbs, are subject to semantic characterization. Having argued the matter elsewhere at considerable length (cf. Langacker in press, to appear), I will limit myself here to sketching the proposed characterization of verbs. This description will allow the analyses that follow to be reasonably precise and explicit.

A crucial aspect of semantic structure is the phenomenon I refer to as profiling, which contributes to the meaning of every linguistic expression. The basis for an expression's meaning is a cognitive domain (roughly equivalent to what Fillmore (1982) calls a frame, and Lakoff (to appear) an idealized cognitive model); any kind of conceptualization is capable of being invoked to serve in this capacity. An expression's profile is some facet of its domain that is singled out and accorded a special type of prominence. Intuitively, the profile defines the focus of attention within the domain; it can also be described as that substructure which the expression designates.³ To take a favorite example, the expression hypotenuse invokes the conception of a right triangle as its domain, and profiles the side of this triangle which lies opposite the right angle. The domain for orphan is the conception of a parent-child relationship in which both parents have died; the profiled entity is the child.

The expressions that concern us do not profile things, but rather relations. The simplest kind of relational expression profiles a single consistent configuration in some domain. We can refer to such a configuration as a state; a relation consisting of only one state is a stative relation. An example of a stative relation is the preposition near, which profiles a relationship of proximity between two entities in space or some other domain. Another example is the adverb fast: its domain is the notion that processes vary in terms of their rate, and the profiled relationship is one in which a process exceeds the norm in this regard. A relation is complex when it cannot be reduced to a single consistent configuration, i.e. when it can only be represented as a sequence of states. An example of a complex relation is the preposition over in a sentence like (5):

(5) The dusty traveler trudged wearily over the bridge.

This use of over locates a mover with respect to an extended path. It implies that the mover occupies all the points along this path, but since the mover is small by comparison and cannot occupy all these points at once, the locative relationship cannot be reduced to a single configuration. Instead, the mover is construed as

occupying the points along the path successively with the passage of time--hence the profiled relation involves not just one state, but a continuous series of states, no two of which are precisely identical.

If one believes, as I do, that a notional characterization is possible for the class of verbs--i.e. that there is some semantic commonality manifested by all verbs but nothing other than verbs--then the existence of prepositions that profile complex relations is seemingly problematic. Since most verbs describe some kind of change, it is natural to propose that the property identifying a verb as such is that it profiles a series of states extending through conceived time. But why, then, is over not a verb when used with the meaning it has in (5)? What is it that semantically distinguishes the verb cross from the preposition across in sentences like (6)?

- (6)(a) A black dog crossed the field.
 (b) A black dog walked across the field.

Examples like these suggest that the difference perhaps does not lie in the conceptual content of the expressions, but rather in how this content is accessed.

My working hypothesis is that the difference between verbs and other complex relations is attributable to certain mental abilities that are both independently established and introspectively apparent. Suppose that somebody throws a ball, and that I watch it sail through the air. The flight of the ball represents a complex relation, as defined above: with the passage of time the ball occupies a series of distinct locations constituting a spatial path; the relationship of the ball to its surroundings does not reduce to a single consistent configuration (state). Now in observing this event, I may simply follow the ball's flight from its starting-point to its destination, so that my conception at any one instant is focused on the momentary position of the ball in relation to its position an instant before. This mode of viewing an event will be referred to as sequential scanning--the states comprising the event are accessed in sequence, and the conception representing any one state is only momentary. However, I also have the ability to construe the process more holistically, either while watching it or during a mental "replay". I can pay specific attention to the ball's trajectory, seeing its trajectory "grow" from instant to instant as the ball sails along its path; at the end, I have built up a conception of the full trajectory that functions as a single gestalt and is manipulable as a simultaneously available whole (e.g. I can observe its shape and assess its degree of curvature). I will use the term summary scanning for this second mode of tracking an event. The states comprising the event are still accessed in sequence, but once activated the conception corresponding to a given state remains active throughout. Thus the full conception grows progressively more complex, the end result being the simultaneous activation and accessibility of all the component states.

The notations previously introduced are capable of representing the difference between sequential and summary scanning. Consider the complex relation diagrammed in Fig. 1(a), which we can interpret as an object falling to the ground. Only four component states are explicitly shown (labeled a, b, c, and d), but they stand for what is actually a continuous series.⁴ The circle indicates the focus (heavy lines will be used throughout to identify the entity that moves or whose location is being specified). The sequential scanning of this complex relation can be formulated as follows:

$$(7) \begin{bmatrix} a \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} b \\ C \end{bmatrix}_{T_2} > \begin{bmatrix} c \\ C \end{bmatrix}_{T_3} > \begin{bmatrix} d \\ C \end{bmatrix}_{T_4}$$

At moment T₁ of processing time, the conceptualizer activates the conception of state a; at T₂, he activates conception b; and so on. Observe that each conception begins to decay as the next one is activated, so that only one is fully active at any one instant. In summary scanning, by contrast, each state remains active as the next one in the series is accessed:

$$(8) \begin{bmatrix} a \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} a \\ b \\ C \end{bmatrix}_{T_2} > \begin{bmatrix} a \\ b \\ c \\ C \end{bmatrix}_{T_3} > \begin{bmatrix} a \\ b \\ c \\ d \\ C \end{bmatrix}_{T_4}$$

The resulting conception grows progressively more complex, so that finally (at T₄) all the component states are superimposed and simultaneously active, as sketched in Fig. 1(b). The directionality in this conception is due to the order in which the states are activated in building up to it.

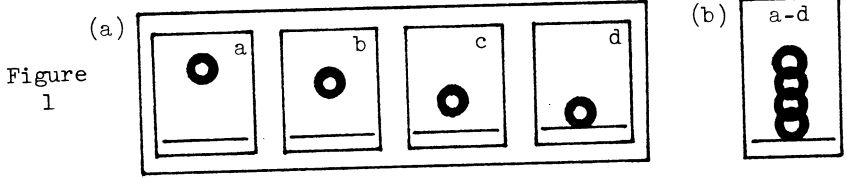


Figure 1

My proposal for the semantic distinction between a verb and a complex preposition (e.g. cross vs. across in (6)) is that the former is characterized by sequential scanning, and the latter by summary scanning. Even if members of the two classes comprise the same series of states and thus have the same conceptual content, they differ in how this content is construed with respect to its pattern of activation through processing time.⁵ More specifically, I analyze a verb as profiling a process, where a process implies the sequential scanning of a complex relation whose component states are taken as being distributed through conceived time.

Letting r_i stand for a stative relation, and using the notation $[r_i]t_i$ to indicate that relation r_i holds at point t_i of conceived time, I offer formula (9) as a semantic characterization considered valid for all members of the verb class:

$$(9) \begin{bmatrix} [r_1]t_1 \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} [r_2]t_2 \\ C \end{bmatrix}_{T_2} > \begin{bmatrix} [r_3]t_3 \\ C \end{bmatrix}_{T_3} > \dots > \begin{bmatrix} [r_n]t_n \\ C \end{bmatrix}_{T_n}$$

A verb is therefore claimed to profile a complex relation $[r_1, r_2, r_3, \dots, r_n]$ extending through span $[t_1, t_2, t_3, \dots, t_n]$ of conceived time. The conceptualizer C (identifiable as the speaker and/or hearer) scans sequentially through this complex configuration during span $[T_1, T_2, T_3, \dots, T_n]$ of processing time.

Actually, we must distinguish two basic classes of verbs, depending on whether they profile a perfective or an imperfective process (cf. Langacker to appear). Roughly speaking, perfective verbs are those that take the progressive, as illustrated in (10), but normally do not occur in the simple present tense; imperfectives do occur in the simple present, as in (11), but resist the progressive.

- (10)(a) My neighbor is washing his car again.
 (b) The coach is screaming at his players.
 (c) A young couple was walking along the beach.
 (11)(a) I know that she understands the difficulty.
 (b) Alice definitely likes tuna.
 (c) Phil believes that Jason resembles his father.

In a perfective, the component states constitute a bounded series, and generally they involve some change through time (i.e. there are adjacent states in the sequence where $r_i \neq r_{i+1}$). By contrast, imperfectives are not specifically bounded, and all the component states are construed as being identical. Formula (9) can be revised as follows to highlight the characteristic properties of imperfectives:

$$(12) \dots > \begin{bmatrix} [R]t_i \\ C \end{bmatrix}_{T_i} > \begin{bmatrix} [R]t_j \\ C \end{bmatrix}_{T_j} > \begin{bmatrix} [R]t_k \\ C \end{bmatrix}_{T_k} > \dots$$

Formula (12) represents the special case of (9) in which no initial or final state is distinguished, and where $r_i = r_{i+1}$ throughout. An imperfective thus tracks through conceived time (by means of sequential scanning) the continuation of a stable situation, given as R in the formula.

Objective Motion

At long last, we are ready to consider verbs of physical motion, such as trudge, walk, swim, climb, roll, etc. The only facet of their meaning that directly concerns us is the mover's

spatial trajectory; we may ignore such factors as the method and rate of locomotion. For our purposes, then, a motion verb can be regarded as a special sort of perfective process, namely one in which each component state specifies the relation between the mover and his immediate location. Starting from formula (9), we can therefore obtain the representation for a verb of spatial movement by substituting for each instance of r_i the more specific notation $[m]l_i$, which indicates that the mover m occupies location l_i :

$$(13) \left[\begin{array}{c} [[m]l_1]t_1 \\ C \end{array} \right]_{T_1} > \left[\begin{array}{c} [[m]l_2]t_2 \\ C \end{array} \right]_{T_2} > \dots > \left[\begin{array}{c} [[m]l_n]t_n \\ C \end{array} \right]_{T_n}$$

Thus, m occupies location l_1 at moment t_1 ; he occupies l_2 at t_2 ; and so on. Through span $[t_1, t_2, t_3, \dots, t_n]$ of conceived time, the mover traverses the spatial path $[l_1, l_2, l_3, \dots, l_n]$. Formula (13) is highly schematic and expresses what all verbs of physical motion have in common. The meaning of go may well be limited to this schematic content when it functions as a maximally generic motion verb.

Consider now some uses of go that do not pertain to spatial motion:

- (14)(a) Roger went through the alphabet in 7.3 seconds.
 (b) This milk is about to go sour.
 (c) The concert went from midnight to 4AM.

Though one's first thought is to treat such sentences as instances of spatial metaphor, it is not obvious to me how strongly or consistently speakers perceive them as such; moreover, to describe a metaphor we must in any case characterize both the source and the target domains, together with the mapping between them (cf. Lakoff and Johnson 1980; Langacker in press, ch. 4). One way or another, we must therefore attribute to go a conventionally-established range of values that indicate change in non-spatial domains.

Actually, there is no need to alter formula (13) to accommodate such examples--we need only interpret the notations in a suitably abstract manner. Under this generalized interpretation, $[l_1, l_2, l_3, \dots, l_n]$ is not to be construed as a spatial path in particular, but simply as an ordered sequence of entities within the relevant domain, such that the "mover" m is capable of interacting with each of these entities individually; $[m]l_i$ then indicates the momentary interaction of m with l_i in this domain. The notions entity and interaction are admittedly vague, but their intended application to the present examples is reasonably straightforward: in (14)(a), the entities are letters of the alphabet, and Roger interacts with a given letter by reciting it; in (b), the entities are points along a scale for evaluating freshness/sourness, and the milk interacts with such an entity by being fresh or sour to a specific degree; in (c), the entities are points in conceived time, and the concert interacts with a point

when its duration extends to include it. What we have done, in effect, is to characterize a maximally schematic concept of motion, with respect to which physical movement through space is just a special case (though clearly prototypical). Let us speak of abstract motion when this schematic conception is applied to non-spatial domains, as in (14). Formula (15) thus describes the abstract motion of somebody going through the alphabet: the mover first recites the letter a at moment t_1 (this is represented formulaically as $[[m]alt_1]$), then the letter b at t_2 , and so on.

$$(15) \begin{bmatrix} [[m]alt_1] \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} [[m]bt_2] \\ C \end{bmatrix}_{T_2} > \dots > \begin{bmatrix} [[m]zlt_{26}] \\ C \end{bmatrix}_{T_{26}}$$

For our later purposes, example (14)(c) holds particular significance. The concert is an abstract mover, making contact with an ordered series of points in time as its duration extends. The formulaic representation of this abstract motion is (16), which is exactly parallel to (15) except that the abstract path of motion is the temporal sequence $[t_1, t_2, t_3, \dots, t_n]$ rather than the letters of the alphabet.

$$(16) \begin{bmatrix} [[m]t_1]t_1 \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} [[m]t_2]t_2 \\ C \end{bmatrix}_{T_2} > \dots > \begin{bmatrix} [[m]t_n]t_n \\ C \end{bmatrix}_{T_n}$$

Observe that conceived time plays two distinct roles in (16). One is the role it has in any process, as defined in (9): the component states of the process are distributed through a continuous span of conceived time (and scanned sequentially through processing time). Its other role pertains to the internal structure of the component states: time serves as the cognitive domain with respect to which the profiled relation is characterized, and is thus analogous to space in verbs of physical motion, or the alphabet in (14)(a). Since the same span of conceived time is involved in both roles, it is perhaps superfluous to indicate t_1 twice at each stage; $[[m]t_1]t_1$ could perfectly well be collapsed to $[m]t_1$. Still, it is important to emphasize the dual role and the parallelism of (14)(c) to other motion predications. The only thing special about this example is that conceived time is itself the domain in which the profiled relation manifests itself.⁶

A possible objection at this juncture is that the definition of abstract motion is so general that any change whatever could be construed as an instance. If so, I am inclined to believe that this consequence might be appropriate rather than unfortunate, for it is not at all obvious that change and motion are ever strongly dissociated in our conceptual world. It would be interesting in this regard to see if there are cases in which a verb meaning 'go' evolves into a pro-verb for the class of perfective processes, or conversely (see Langacker 1981 for a possible example).

Subjective Motion

A perfective motion verb profiles change through time in the spatial location of the mover. There are also verbs that profile the static location of an entity:

- (17)(a) A statue of Johanna Nichols stands in the plaza.
(b) The United States lies between Mexico and Canada.

Here stand and lie are imperfective, i.e. they profile the continuation through time of a stable situation. In (12), the general formula for imperfective processes, the profiled relation scanned sequentially through conceived time was represented by R. To accommodate the special case where the profiled relation is locative, we need only substitute for R the more specific notation [ML], indicating that entity M occupies location L:

$$(18) \quad \dots > \left[\begin{array}{c} [[M]L]t_i \\ C \end{array} \right]_{T_i} > \left[\begin{array}{c} [[M]L]t_j \\ C \end{array} \right]_{T_j} > \left[\begin{array}{c} [[M]L]t_k \\ C \end{array} \right]_{T_k} > \dots$$

Though M does not move, it is analogous to a mover in being the entity whose location is specified. Observe that C's conception at any one instant is of the form [[M]L]t_i, which is basically the same as it is in the case of motion verbs, namely [[m]l]t_i (cf. (13)). What distinguishes the two types of verbs is whether the locative specification differs from one state to the next, or remains constant throughout.

Consider now the following pairs of sentences:

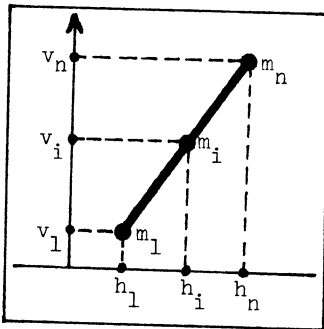
- (19)(a) The roof slopes steeply upward.
(b) The roof slopes steeply downward.
(20)(a) The hill gently rises from the bank of the river.
(b) The hill gently falls to the bank of the river.
(21)(a) This highway goes from Tijuana to Ensenada.
(b) This highway goes from Ensenada to Tijuana.

Like the ones in (17), these sentences describe stable situations in which nothing is portrayed as moving or otherwise changing. The felicity of the simple present tense confirms their analysis as imperfective processes: each profiles a single, constant configuration and follows its continuation through conceived time. Obviously, though, something more is going on. In (19)-(21) there is in each instance a clear semantic contrast between (a) and (b) that cannot be attributed to objective properties of the profiled configuration, since precisely the same configuration is designated by the members of each pair. Intuitively, it seems evident that these sentences incorporate a sense of directionality that is lacking in (17)--the (a) and (b) sentences contrast semantically because they imply opposite directions. But how can we meaningfully speak of directionality when nothing moves or changes?

This is another instance where a semantic contrast does not reside in the conceptual content of two expressions, but rather in how that content is accessed (recall cross vs. across). For instance, (19)(a) and (b) describe precisely the same situation pertaining to the spatial orientation of the roof, and both portray this situation as extending through conceived time without essential change; in this sense their conceptual content is identical. However, the profiled spatial configuration has a certain degree of internal complexity, because M (the roof) is itself an elongated, path-like entity. We can reasonably suppose that the conception of such a configuration requires a certain span of processing time for its full activation: rather than springing instantaneously into full-blown existence, the conception might be built up incrementally, with all facets of it being active only at the conclusion of this build-up phase. If so, the directionality we perceive in such sentences is attributable to the order in which the various facets of the configuration are activated. Moreover, since different orders of activation can lead to the same overall configuration, we have a way of accounting for the semantic contrast.

In Fig. 2, I have sketched the overall locative configuration [M]L whose continuation through conceived time is profiled by the sentences in (19). The domain for this conception is oriented space, i.e. space organized into the horizontal and vertical axes. The roof, M, is an elongated object whose alignment with respect to these axes is being assessed. Let us refer to the points along the spatial extension of M as $[m_1, m_2, m_3, \dots, m_n]$; in the diagram, m_1 is equated with the roof's lower extremity, and m_n with its upper extremity. Each point m_i along the roof's extension occupies location l_i in oriented space; l_i reduces to the combination (h_i, v_i) , where h_i is the horizontal projection of m_i , and v_i its vertical projection. L, the spatial location of M, therefore does not consist of a single point, but rather the path-like set of points $[l_1, l_2, l_3, \dots, l_n]$.

Figure
2



[M]L

$$M = [m_1, m_2, m_3, \dots, m_n]$$

$$L = [l_1, l_2, l_3, \dots, l_n]$$

$$\text{where } l_i = (h_i, v_i)$$

I am assuming that every conception involving directionality at the experiential level implies some kind of seriality at the processing level. The directionality in (19) is attributed to the build-up phase leading to the full activation of configuration

[M]L. For (19)(a), we may posit the following sequence of activation:

$$(22) \begin{bmatrix} [m_1]l_1 \\ C \end{bmatrix}_{T_1} > \begin{bmatrix} [m_1]l_1 \\ [m_2]l_2 \\ C \end{bmatrix}_{T_2} > \begin{bmatrix} [m_1]l_1 \\ [m_2]l_2 \\ [m_3]l_3 \\ C \end{bmatrix}_{T_3} > \dots > \begin{bmatrix} [m_1]l_1 \\ [m_2]l_2 \\ [m_3]l_3 \\ \vdots \\ [m_n]l_n \\ C \end{bmatrix}_{T_n}$$

That is, in building up to the full conception, C first activates subconfiguration $[m_1]l_1$, then $[m_2]l_2$, and so on. Summary scanning is employed, so once initiated each subconfiguration remains active throughout; as a consequence, the conception grows progressively more complex with the passage of processing time, until the full configuration [M]L is simultaneously active at T_n . Experientially, it is as if the roof "grows upward" starting from its lower extremity m_1 , eventually reaching its full extension.⁷ The analysis of (19)(b) is identical except that m_1 is equated with the roof's upper extremity, and m_n with its lower end. The sequence in (22) is then manifested experientially as the roof "growing downward" from top to bottom. But either sequence of activation results in the same overall configuration [M]L, whose extension through conceived time is scanned sequentially. Observe that conceived time plays no inherent role in the build-up phase, as [M]L itself is atemporal. The perceived directionality of (19) derives instead from the order in which its subconfigurations are accessed through processing time.

We can of course speak of motion in sentences like (19), but motion of a special sort. As M "grows" upward or downward from its starting point, its leading edge can be thought of as moving through space in much the same way that the concert moves through time in (14)(c). However, as (22) shows, the position of M's leading edge changes only through processing time, not through conceived time; only by taking into account the time axis of the construal relation itself do we obtain the temporal component necessary for considering this to be a type of motion. Once we invoke processing time in this fashion, additional instances of motion can be discerned in (22). For these latter, the mover is not M, but rather C.

The conceptualizer can be thought of as moving along either of two paths: $[m_1, m_2, m_3, \dots, m_n]$ (= M), or $[l_1, l_2, l_3, \dots, l_n]$ (= L). This motion on the part of C is both abstract and subjective, as these terms were defined earlier. Let us focus on M (the case of L is exactly parallel). C's conception of M counts as an instance of abstract motion according to the following rationale: (i) $[m_1, m_2, m_3, \dots, m_n]$ constitute an ordered set of entities; (ii) during the build-up phase, C accesses these entities in sequence, i.e. he first activates the conception of m_1 , then that of m_2 , and so on; (iii) by activating the conception of a particular entity m_1 , C can be regarded as interacting with it

mentally (just as one interacts with the letters of the alphabet by reciting them--cf. (14)(a)); and (iv) each such interaction takes place at a distinct point in (processing) time. We need only restate these interactions in the format $[[C]_{M_i}T_i]$ to see that they qualify as an instance of abstract motion, with C as the mover.

C's motion in (22) is not only abstract but also subjective. The reason, quite simply, is that C does not conceive of himself as moving along a path: as (22) clearly reveals, C's conception at any instant is limited to some portion of the locative relationship [M]L, and his own role in this relation is purely subjective. It is only from the external perspective of the analyst that C moves abstractly along a path. Barring self-analysis (where C would play a dual role, as in (4)), the conception that C himself entertains is merely the directional construal of a static configuration.

Avenues of Semantic Extension

The sentences in (20), (21), and (23) illustrate a common type of semantic extension:

- (23) A white fence runs/stretches/reaches/extends from one end of his property to the other.

In each case, a perfective verb of physical movement has developed an additional, imperfective value in which it describes the continuation through time of a static configuration. The conception of motion has not disappeared entirely, however; a shadow of it remains in the directionality with which the static configuration is construed, as characterized in (22). Whereas the basic meaning profiles physical motion by an objectively-construed mover (namely the subject), one (unprofiled) facet of the extended meaning is abstract motion by a subjectively-construed mover, specifically the conceptualizer. The pivotal factor in this type of semantic shift is therefore subjectification: an originally objective notion is transferred to the subjective axis of the construal relation itself.

A second common avenue of semantic extension is for the profile of a complex relation to be restricted to its final state; the extended meaning then constitutes a stative relation. The prepositions in (24) represent complex relations--each of them profiles a series of states that do not reduce to a single, consistent configuration.

- (24)(a) The prisoner ran to the fence.
 (b) Abernathy crawled through the tunnel.
 (c) The scouts hiked over the mountain.

The corresponding stative relations are illustrated in (25). Each preposition profiles only a single locative configuration, but one that is construed as the last in a series of configurations defining an extended spatial path.

- (25)(a) The prisoner is already to the fence.
 (b) Abernathy must be through the tunnel by now.
 (c) The scouts were over the mountain by noon.

The profile of a complex relation is similarly restricted to its final state in the case of adjectival past participles (e.g. swollen designates the final state of the process swell); here, of course, the relationship involves derivation rather than semantic extension.

Consider now the following sentences:

- (26)(a) A stray dog walked across the plaza, through the alley, and over the bridge.
 (b) The Linguistics Hall of Fame is across the plaza, through the alley, and over the bridge.

Both incorporate the complex locative expression across the plaza, through the alley, and over the bridge, which describes an extended spatial path. Since (26)(a) profiles spatial motion by an objectively-construed mover, the occurrence of such a locative is quite natural. Why, however, should a path locative appear in (26)(b), which does not describe motion at all, but only the static, point-like location of its subject?

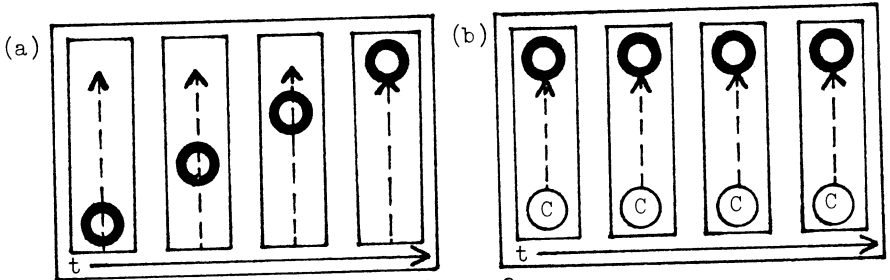


Figure 3

My proposal is that the locative in (26)(b) receives a special interpretation that combines the two types of semantic extension previously discussed. The normal value of a path locative, corresponding to the objective spatial motion of (26)(a), is depicted in Fig. 3(a): with the passage of conceived time, the objective mover (i.e. the subject) occupies successively all those points that constitute the extended spatial path (indicated by the broken arrow). The effect of subjectification is to replace the objective spatial motion of the subject with abstract, subjective motion on the part of C in building up to his conception of a stable objective configuration. We observed this effect in (19)-(21), and we observe it again in (26)(b). The difference between the two cases resides in whether or not the second type of semantic extension--profile restriction--also applies. It does not apply in (19)-(21), where the profiled objective configuration essentially "telescopes" all the component states of Fig. 3(a); the subject is an elongated entity (a roof, hill, or highway) that simultaneously

occupies all the points along the extended spatial path. In (26)(b), by contrast, the subject occupies only the endpoint of the path, corresponding to just the final state of Fig. 3(a); we obtain this result by first applying profile restriction and then applying subjectification to its output. The product of these two semantic extensions, as applied to Fig. 3(a), is thus the structure represented in 3(b). Through time, the subject is stably located at the endpoint of a path anchored at the other end by the position of C, whose abstract and subjective motion along this path allows him to compute the location of the subject relative to his own.

Finally, let us consider sentences in which a finite motion verb takes an infinitival complement (see Lamiroy 1983 for insightful discussion):

- (27)(a) Il monte se coucher. 'He is going up to go to bed.'
 (b) Il court le regarder. 'He is running to look at it.'

Semantically, it is specified that the subject traverses a spatial path, at the end of which he initiates the process indicated by the infinitival complement. Formally, these sentences are precisely parallel to those in which a verb meaning 'go' comes to indicate futurity. Thus, while (28) might be construed as indicating spatial motion that terminates in the process of door-opening, it is far more likely to be interpreted as a 'gonna'-type future, just as in the English translation:

- (28) Il va ouvrir la porte. 'He is going to open the door.'

This example brings us back to our original question: what is the proper way of describing the common semantic extension from 'go' to 'future'?

To account for this development, we need only combine the two avenues of semantic extension just considered with a third one that is massively attested in natural language: the application of a spatial term to the temporal domain (recall the discussion of (14)(c)). The extension from 'go' to 'future' is therefore captured by the difference between Figs. 3(a) and 3(b), provided that the path of motion is interpreted as being spatial in the former and temporal in the latter. With the path construed as a spatial one, Fig. 3(a) represents the movement sense of (28); at the endpoint of his motion, the subject initiates the process specified by the infinitival complement. With the path construed as a temporal one, Fig. 3(b) represents the futurity sense of (28). Under this interpretation, (28) profiles the continuation through time of a stable configuration whose domain also happens to be that of conceived time. What is this temporal configuration? It is one in which the subject's initiation of the infinitival process lies downstream in time from the location of the conceptualizer; since C is the speaker and/or hearer, C's location is the time of the speech event. Moreover, C computes the position of the infinitival process relative to his own (the time of speaking) by sequentially

activating, during the build-up phase, his conception of the temporal path linking the two.

In sum, it is not the subject who moves through time when a sentence like (28) indicates futurity, but rather the conceptualizer, whose motion is both subjective and abstract. I suspect that subjectification, as witnessed by the shift from 'go' to 'future', is a recurrent factor in the semantic "bleaching" that accompanies grammaticization.

Footnotes

¹For discussion and illustration of this framework (also called space grammar), see Casad and Langacker 1985; Hawkins 1984; Langacker 1981, 1982, 1984, 1985, 1986, in press, to appear; Lindner 1982; Tuggy 1981; Vandeloise 1984; and papers by myself and others in Rudzka-Ostyn to appear.

²Though time may not be salient in such a conception, it is nonetheless invoked as an axis along which the action unfolds.

³Rather than being understood in any standard philosophical sense, this term must be given some appropriate cognitive interpretation. It pertains to the structure of conceptualizations, not to the relation between language and "the world".

⁴The discreteness implied by the diagrams and formulas is purely for expository convenience, and is not intended as a claim about cognitive representation.

⁵The subtlety of this contrast is consonant with the fact that languages often fail to make a formal distinction between verbs and complex non-verbal relations.

⁶Many other expressions have time as their primary domain, e.g. before (They finished before I got there), which is a stative relation according to the definition given earlier.

⁷Of course the entire sequence in (22) occurs in a matter of milliseconds; despite the seriality, it is almost instantaneous experientially.

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