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In this paper[1], I would like to show that we need an integrative model to account for time evocation in cognitive semantics. With such a model, we might be able to describe and formalize future time evocation in terms of what will be defined as 'windowing'.

1. A TOPE-based description of the grammatical forms of future time evocation

A formal description of the grammatical forms of future time evocation is first necessary. It will be made using the conceptual tools of the Theory of Predicative and Enunciative Operations (*TOPE*). The concepts developed in this theory may help us describe the operation of windowing which is central in future time evocation, as will be shown.

The grammatical forms of future time evocation

The large variety of grammatical means expressing future time in English are found in the various categories of the language, such as modality (*will, shall, would, should*), aspect (*be+Ving* form), tense (present) and syntax (for the sake of simplicity, *to + infinitive*)[2]. Even if English is a "satellite-framed language" in Talmy's typology (Talmy 2000a), future time evocation is mainly a *verbal* matter. The future event is represented by the verb, in its various forms. All these forms are consequently *context dependent* to evoke future time, but with major differences from one linguistic form to another. Modals for instance, and particularly *will*, need a future specific context (mainly adverbs expressing future time, like 'tomorrow'), even if this auxiliary is generally given as the prototype marker of future time in English (cf. Langacker, 1987). On the contrary, *be+V-ing*, which mainly expresses aspectuality, does not need only temporal adverbs. This form rather needs modal adverbs to evoke future time (whereas we could expect it to need temporal adverbs since it is a highly polysemous form, cf. Col 1997).

Location, connection, disconnection

Apart from context dependency, the other main characteristic of future time evocation is the *location of the future event*. For Culioli (Culioli 1990a, 1999a), an event is an occurrence of a notion located relative to a moment. An event does not refer to reality, or

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2. Naturally, some of these means are cross-categorial, such as *going to* and its clitic form '*gonna*', or *would/should*, both modal and temporal forms in specific contexts (indirect speech for example).

to action. It is defined as an abstract entity extracted from a notional domain[3]. Having been extracted, this entity is located relative to a moment (cf. 1.2. for the definitions of 'notion' and 'extraction'). What is called 'location' is an operation consisting in situating an entity (linguistic or notional) relative to another one (a landmark). The outcome of the operation can be the identification, the differentiation/connection, or else the disconnection of two different entities. In the context of future time, these three realizations of location are represented: identification with *be + V-ing*, connection with *be going to* and disconnection with *will*.

Be + V-ing: a case of identification between temporal landmarks

For Bouscaren and Chuquet (1992), *be + V-ing* marks the identification of the moment of the event to come (called T_1) with T_o, the point of origin (which is not necessarily the present time but an abstract moment, a spatio-temporal parameter in an abstract system of representation). The notion of identification is closely associated with the semantic values of *be*. In:

(1) *We're both leaving. We've got it all planned.*

be expresses identification between the moment of the event to come and the moment of uttering. As for *–ing,* this morpheme indicates that the process is seen from an internal perspective. Thanks to *be*, this perspective is anchored in the situation of uttering. In our example, there is no adverb expressing future time, such as 'tomorrow ' for instance. The future meaning of *be+ing* thus emerges from the verb type. *Leave* generally makes no distinction between the initial and the final states of the process, but *be leaving* does, creating an interval in which the speaker's ("énonciateur") perspective is situated. The realization of the process is then anticipated, since as we shall see, the process (or part of it actually) is shown in advance in the temporal window (see part 4 for the definition of 'temporal window').

Will, be going to and the opposition between 'connection' vs. 'disconnection'

The modal *will* evokes future time among other modal meanings (root modality and epistemic modality). Modalizing means there are at least two different (logical) values for the process: p and non p. This alterity means that the moment associated with the event is disconnected from the moment of uttering. Disconnection means that there is a bridgeable gap between both moments. To illustrate this description of *will* in terms of disconnection, I will show a few examples:

(2) *Once she understands the consequences of her actions, she'll go easy on you*. (PhD Diss. corpus)

The realization of the future event depends on the realization of the condition, hence the gap between the moment associated with the condition and the moment associated with the realization of the event.

(3) *And when you join the National Geographic Society, you'll receive a brief*

3. A notion is "a complex bundle of structured physico-cultural properties" represented topologically as a domain (Culioli 1990b: 69).

illustrated history of the society. (PhD Diss. corpus)

The condition is here defined as a future condition, hence again the gap between the situation of uttering and the situation relative to which the realization of the event is situated.
Examples (4) and (5):

(4) *I'm going to call you tomorrow and I'll tell you then.* (Ph D Diss corpus)
(5) **I'll call you tomorrow and I'm going to tell you then.*

show that *will* implies that the realization of the event is located relative to a disconnected situation, whereas *be going to* presents the realization in the continuity of the present situation. The impossibility of (5) means that the prediction expressed by *be going to* has to be anchored in a situation. The moment of realization of the future event is then connected with the moment of uttering even if they are not similar; they are actually 'differentiated'. A connection between both moments is established in the case of *going to* according to the spatial meaning of *go*.
What we should keep in mind is the distinction between connection and disconnection on the one hand, and identification on the other. However, some forms cannot be analyzed in terms of location in the same way as *will* or *going to*. *To* + infinitive for instance, which is present in other forms than *going to* (see *be bound to, is to, be likely to…*), refers to what we could call, in the *TOPE* model, an *underspecified occurrence of a notion*[4]. A 'notion' is a system of representation of various physico-cultural properties linguistically associated with a large set of units. For example, the notion /drink/ is manifested in the English language by 'a drink', 'to drink', 'drinking', 'glass', 'bottle', 'pub', etc. whatever the grammatical category these units belong to. Moreover, a notion is topologically represented by a dynamic space called a 'domain', which can be partitioned into sub-domains. These sub-domains are linguistically represented by 'occurrences', i.e. nominal or verbal units, for instance 'to drink' vs. 'a drink'. From this perspective, grammatical units (articles, tenses, pronouns, etc.) are seen as markers of operations consisting in determining and specifying these sub-domains, hence specifying the occurrences of a notion. An occurrence of a notion, be it nominal or verbal, is the end product of different operations of determination. As for the case of *to* + infinitive at stake here, this form is a case of 'underspecification', due to its status as non-finite verb form. As there are no person markers nor time markers, its meaning depends on the main verb's meanings (*go*, or *be* in the previous examples) or on an adjective (*likely*, in *be likely to* for instance). *To* + infinitive indicates that the occurrence of the notion is actually 'extracted' from the notional domain lexically represented by the verb. This form marks the operation of 'extraction' (also called 'granular scanning', Culioli 1995: 141), which consists in singling out one element from a class with no other specification; this element thus acquires an existential status but no other qualitative properties. V-*ing* and the verbal base (V), which are non-finite verb forms present in the main verbal constructions evoking future time, also mark operations of specification: the verbal base marks the operation consisting in encompassing a whole notional domain which is not fragmented ('notional reference'), whereas V-*ing* marks the operation consisting in attributing a distinctive property to an occurrence 'in order that the occurrences be opposed to the rest of the class of occurrences' (Osu 2003 : 533). This operation is called 'pinpointing'. In the issue of future time evocation, these three non-finite verb forms represent three different semantic

4. See Chuquet 1986.

structures construing, to a certain extent, different 'visions' of the event to come. So, if we want to encompass the differences between the grammatical forms evoking future time, we need a model which integrates both characteristics of future time evocation in the TOPE model, i.e. the *location* of an event marked by the auxiliary and the *characterization* of the semantic structure emerging from the non-finite verb form. But future time evocation is not only a matter of location and characterization, it is also a matter of windowing, as we will see in the following part.

2. Some aspects of the experience of future time in cognitive psychology

The experience of time is related to perception and sensory experience (Pöppel 1994; Michon 1980, 1998). In the field of cognitive psychology, what is accepted today about perception is precisely that it is based on 'perceptual moments', or temporal intervals "which facilitate the integration of sensory experience into perceptual 'time-slots'" as Evans (2004: 13) puts it. In perceptive terms, the experience of time may then basically be described as a *windowing experience*. The experience of future time proper has yet another characteristic: it may be described as a *non-direct* perception, in the sense that "all perceptual operations, and indeed all operations of thought and action, are accomplished by multi-track processes of interpretation and elaboration" (Dennet and Kinsbourne 1992: 183). As Dennet and Kinsbourne put it, "the temporal order of subjective events is a product of the brain's interpretational process, not a direct reflection of events making up those processes" (Dennett and Kinsbourne 1992: 183). It is nonetheless an experience grounded in one's *direct perception*, in the sense that "the experience of time is the conscious product of processes that enable us to cope with the sequential contingencies of reality" (Michon 1980: 37)[5]. The experience of future time is then *conflictual*: future time evocation is the experience of a non-direct multi-track perception whereas subjectivity is grounded in *direct* perceptions. Evans sums up the issue in the following terms: "Time is not a concrete sensory experience. […] Unlike our perceptual apparatus for assessing spatial experience […], there is no analogous sensory apparatus specifically dedicated to the processing of temporal experience" (2004: 28).

The usual solution for tackling the conflict is to make a distinction between 'subjective' time or 'internal' time (in French *temps vécu*), and 'objective' time or 'external' time (*temps observé*). We have both implicit (abstract) and explicit (accessible) representations of time. Thus, future time might be considered either as coming toward us or as something toward which we are going. It encompasses the classic cognitive distinction made between the Moving Time Model v. the Ego Moving Model (see for instance Lakoff and Johnson 1999, or more recently Evans 2003, 2004). I suggest that these two aspects of time should actually be unified into a more general semantic model, following more general cognitive mechanisms.

3. The operation of windowing in future time evocation

The notion of windowing is a central notion in psychology, and a well-established one: "future time is above all the experience of a temporal intervalle" as Fraisse puts it (1957:

5. This operation is called *tuning*: « Tuning is the continuous and automatic process of parsing and interpreting the world and anticipating what will happen next » (Michon 1998: 7).

171). This notion also plays a fundamental role in what Tomasello calls the Partitioning Process, i.e. "the process of taking different perspectives on events as the speaker windows and gaps different aspects of the event for the listener" (Tomasello 1999: 156). It is a central notion in linguistics as well. Gosselin, for instance, makes an interesting distinction between the "reference interval" and the "interval of the process". The first one corresponds to the "opening of a window on time in motion (operation of showing), whereas the interval of the process corresponds to the categorization of what is shown" (Gosselin 2005: 105, my translation). As for Talmy, windowing is part of a more general cognitive operation: the distribution of one's attention over a referent scene. The Windowing of Attention (Talmy 2000a: 257-309)[6] is a cognitive operation consisting in the foregrounding of a portion of a coherent situation by the explicit mention of that portion. My conception of windowing partly encompasses Talmy's: a temporal window is *a linguistic simulation showing parts of an event*, namely an event to come. The specificity of windowing in the case of future time evocation resides in *what is shown in the window, i.e. the semantic structure, and the access to this structure*. For me, a temporal window is defined as a region of what Tomasello (1999: 156) calls the 'joint attentional scene'.

My assumption is supported by Langacker's notion of 'profile' as well. Langacker defines 'profile' as "the entity designated by a semantic structure. [It] functions as the focal point within the objective scene [the general locus of viewing attention; the onstage region within the scope of prediction], and achieves a special degree of prominence" (1987: 491). This idea creates an interesting difference of profile between the *be going to* construction and what Langacker calls a 'true future-tense marker' (*will*). For him, "[*Aller* and *be going to* do not profile the future event but] designate the continuation through time of the (locally) stable configuration in which the landmark event (expressed by the infinitival complement) lies downstream in time from the reference point [R]" (Langacker, 2002: 332), as illustrated in Figure 1:

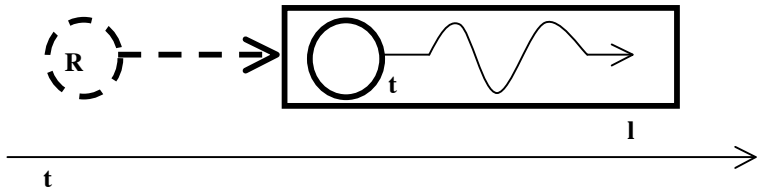

Figure 1

What is profiled in the construction is the relationship between the reference point and the event, hence the conceptualizer's motion on the temporal path leading to the event: "at the endpoint of his motion, the subject initiates the process specified by the infinitival complement" (2002: 163). On the contrary, the *will* construction profiles the "downstream event – a schematic process – […] not its relation of temporal posterity to the reference point" (2002: 333), as illustrated in Figure 2. This type of profiling is typical of the modal construction (cf. 2002: 333-337).

6 This model is also close to the notion of Temporal Map developed by Ghadakpour and Dessalles (2004).

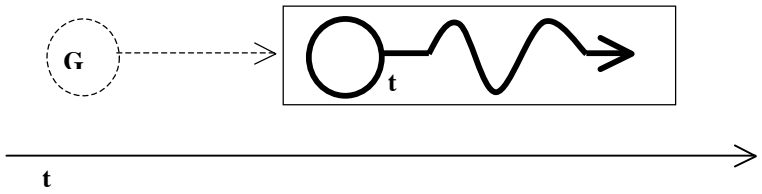

Figure 2

Langacker's distinction between *be going to* and *will* shows that what is crucial in the case of future time evocation is the difference in profiling: the profiling of the event vs. the profiling of the relationship. I assume that 'profiling' and 'windowing' are close operations that may account for future time evocation, in the sense that they both partake of "the process of taking different perspectives on events as the speaker windows and gaps different aspects of the event for the listener" as Tomasello puts it (1999: 156).

4. A reanalysis of grammatical forms of future time evocation

I would like to show that the three grammatical forms of future time evocation on which I have chosen to concentrate should be analyzed as markers of windowing, making explicit three aspects of the operation. Their common point is that they are complex forms (auxiliary + verb). In my conception, each element of the complex form, that is the auxiliary on the one hand and the non-finite verb form on the other, gives an indication about the location of the temporal window and the characterization of the semantic structure showed in the window (its specification).

The principle is the following[7]:

- the auxiliary (or semi-auxiliary in the case of *be going*) indicates the position of the window, i.e. whether the window is connected to or disconnected from the reference situation (the situation of uttering).
- the verb and its various non-finite forms (verbal base, *to* + verbal base, or *V-ing* form) indicate what is shown in the window[8].

The temporal meaning developed in the utterance[i], futurity in the present case, comes both from the window, i.e. the frame and its position, and from its contents, i.e. the semantic structure. *To evoke time is to create a temporal window, to locate the window, and to specify the structure viewed in it*. The temporal window thus integrates both aspects of time (internal time and external time), thus future time evocation emerges from the *unification* of internal time and external time.

Be going to + V

The window created by *be going to* is connected to the situation of utterance. *Be going to* presents the realization of the future event in the continuity of the present situation. The

7. My view is a unifying one. In my cognitive perspective, an utterance may be analyzed in terms of 'distributed predication' (Col 2006): each element of an utterance takes part in the emergence of meaning, thus integrating notions and operations.

8 Other characteristics of the window, such as its dimensions and its dynamics, are presented in Col and Victorri 2007.

realization of the future event is thereby connected to the moment of uttering. The event may be considered as the target of the abstract motion expressed by the verb. Yet futurity comes from something other than motion; see for instance the following opposition:

(6) *I'm going to / gonna have a drink tonight*
(7) *I'm going to the pub tonight*
(8) **I'm gonna the pub tonight*

The impossibility of (8) comes from the purely spatial meaning of *go* (to a specific place, in this sentence), whereas (6) has a temporal meaning (associated with some kind of intention). A verb, hence a process, is required to make futurity emerge from the construction; in other words, X in [TO X] needs to be verbalized and thereby dynamized to make futurity emerge.

The non-finite verb form plays yet another part in the emergence of future time meaning. *To* + infinitive indicates that the structure it conveys is evolutive. I showed above that this structure corresponds to the occurrence of a process that is 'extracted' from the notional domain associated with the process, meaning that it is singled out with no other specification. This 'underspecified' structure emerges from a connected window, hence the meaning generally associated with *be going to*, that is, proximity in time, and certainty. The future time meaning of *be going to* depends both on the location of the window (the window is connected, by means of the *be* component) and the contents of the window: what is shown and seen in it is indeed an evolutive structure. 'Evolutive' should not be considered as 'prospective': the structure is *partial*; we only see a part of it. Hence the idea of evolution: the structure is *dynamically non-complete*, meaning that it is to be completed. *To* + infinitive does not express time at all; it is the whole configuration – *be going to* + V – that evokes future time. And the whole configuration conveys an underspecified structure viewed in a connected temporal window.

Be + V-ing

The future time meaning of *be+V-ing* is less direct than in the case of *be going to* since it emerges from a wider range of contextual elements (like verbal negation, first person pronouns, verb types such as change of state verbs, for instance *leave*, *get*. See Col 1997). The context may not be properly temporal, or even prospective. The distribution of the predication is therefore larger than with *be going to*[9].

In the cognitive perspective of windowing, the case of *be+V-ing* is quite different from *be going to*. *Be* indicates that the temporal window is anchored in the situation of uttering, it is 'connected' to this situation. We have also seen in part 1 that *be+V-ing* marks the operation that consists in attributing a distinctive property to an occurrence ('pinpointing'). The contents of the window are different than in the case of *be going to*. The latter contains an underspecified structure (the notional occurrence is singled out from the others without any other specification), whereas the former contains a more specified structure, in the sense that the corresponding occurrence is qualified and not only quantified. The process is seen from an 'internal perspective' as Langacker puts it (2002: 92); what is seen actually extends further than the frame of the window, providing evidence of the aspectual meaning of the construction, that is to say imperfectivity. The structure is in some way larger than the window. We have previously seen that with *be+V-ing* the future event is 'anticipated', thus echoing what Evans specifies about the

9 See Col 2006 on the issue of the *scope* of the Distributed Predication.

concept of future time which, for him, "derives from the present anticipation of an objective or goal" (Evans 2003: 192). To say that the future event is 'anticipated' actually means, in the conception of time developed here, that only a part of the corresponding structure is shown in the window. What is seen is the initial state of the process, and the final state is backgrounded. The structure is then partial again, as with *be going to*, but for different reasons: only a part of the structure is shown in the temporal window, the initial part. And this part is shown in a window that is anchored in the situation of uttering. The rest of the structure, which is unseen and gapped, is the final state still to be shown. The value generally attributed to *be+V-ing*, planification, is here confirmed: to plan a future event is a way of anticipating its realization, showing its initial state in a connected temporal window.

Will + verbal base

The last form I will analyze, the modal configuration [*will/ would/ shall/ should* + verbal base], is a specific case of location. I shall consider here the case of *will* expressing prospective value only. Owing to the disconnected modal position expressed by the auxiliary, the window is disconnected from the situation of uttering. Its connection depends on various factors such as volition, force, constraint, etc. Actually, owing to the disconnection of the window, the structure is not, properly speaking, shown. Nothing is really shown in the window, because the verbal base means that the occurrence of the process is represented by the notional domain as a whole and not by a particular occurrence as with *be going to*[10]. It is, to some extent, a rough structure, lacking semantic specification. It will be observed, for instance, that all kinds of verb are compatible with the configuration, whatever its lexical aspect, contrary to *be+V-ing* as seen earlier. In the utterances where *will* contributing to the evocation of future time is present, we generally find temporal adverbs, especially prospective adverbs such as *tomorrow*, *tonight*, etc. The presence of these adverbs indicates a way to locate the window itself, but does not really say anything about the structure, which is linguistically represented by an underspecified form. The chief issue is not the characterization of the structure (it is underspecified) but the connection of the window with the situation of uttering. In the following extract:

> (9) "O, Mr. Conroy, **will** you come for an excursion to the Aran Isles this summer? **We're going to** stay there a whole month. It **will** be splendid out in the Atlantic. You ought to come. Mr. Clancy **is coming**, and Mr. Kilkelly and Kathleen Kearney. It would be splendid for Gretta too if she'd come. She's from Connacht, isn't she?"
>
> "Her people are," said Gabriel shortly.
>
> "But you **will** come, won't you?" said Miss Ivors, laying her arm hand eagerly on his arm.
> "The fact is," said Gabriel, "I have just arranged to go…" (J. Joyce, *Dubliners*)

the question "will you come for an excursion to the Aran Isles this summer?" repeated a few lines further down ("But you will come, won't you?") relates to the subject joining in the event to come. The event itself is described by sentences such as "We're going to stay

10 A distinction between the verbal base as in the modal construction and the verbal form found in *be going to* (among other *to* + infinitive constructions) is made here (cf. Col & Duchet 2000).

there a whole month," and "Mr. Clancy is coming, and Mr. Kilkelly and Kathleen Kearney". What I call the 'semantic structure' expressed by the verb forms in these sentences is specified insofar as the length ("to stay there a whole month") and the participants in the events ("Mr. Clancy and Mr. Kilkelly and Kathleen Kearney") are specified. In both cases, the window shows an aspect of the event (length and participants). Now, the question "will you come for an excursion to the Aran Isles this summer?" concerns a hypothetical participant, i.e. his will to come but not his actual coming. The sentence "It will be splendid out in the Atlantic" might be interpreted as the specification of the future event, but what *specifies* the event itself is not 'be splendid' but 'stay a whole month' and the various persons mentioned in the text. 'Be splendid' *qualifies* the event, but its status of event to come is still underspecified in this sentence. *Will* marks that the moment of the event is disconnected from the moment of uttering; the event itself is 'profiled' but "not its relation of temporal posterity to the reference point" (Langacker, 2002: 333) as it is the case with "We're going to stay there a whole month". Thus *will* sets the question of the connection of the window with the situation of uttering: 'be splendid' is indeed a qualification of the event, but the window does not show this event, it only suggests it by qualifying it.

Conclusion

I have described an integrative model to analyze the grammatical forms of future time evocation in English. It is based on the assumption that the different conceptualizations of time ('subjective' time and 'objective' time) have to be unified so as to follow a general cognitive capacity, the Partitioning Process (cf. Tomasello 1999). In this process, the operation of windowing plays a central part. I have tried to show, through the description of three major grammatical forms (*be going to*, *will* and *be + V-ing*) that the cognitive operation of windowing is at work in future time evocation. This operation consists in locating a frame (the window) and characterizing its contents (a semantic structure). The window is not a segment of time, but a region of the 'verbal scene' (Victorri, 1999) representing the meaning of the utterance. According to each grammatical form, all of which are complex forms (auxiliary + verb form), some parts of the semantic structure are windowed and others are gapped. The auxiliary marks the location of the temporal window and the non-finite verb form specifies the contents of the window, i.e. some aspects of the event to come.

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