CHAPTER TWO

TENSE-ASPECT-MOOD-EVIDENTIALITY (TAME) AND THE ORGANIZATION OF HUMAN MEMORY

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Introduction

In a wide sense of the word remember, I remember both that beavers build dams and that I will give a lecture tomorrow. But in a stricter sense, I can only remember what happened in the past, for instance, that I gave a lecture yesterday. All these things are in my memory, but clearly, they differ in their status there. That human memory is in many ways dependent on time is hardly a controversial statement, but it entails that there is at least an indirect relationship between memory and those linguistic phenomena that relate to time, such as the distinction between I will give a lecture and I gave a lecture.

In this paper, I will discuss whether there is also a more direct relationship between the organization of human memory and the cluster of grammatical elements usually subsumed under labels such as tense, aspect, mood, and evidentiality. This is an area which has hardly been explored at all, at the same time as memory research is a rapidly developing field with many competing theories. It is not my intention to argue for any definite hypotheses but only to point to possible connections that deserve to be further explored.

The structure of the paper is as follows. First, I shall give a brief sketch of the linguistic phenomena involved, then, a somewhat more detailed outline of the aspects of the organization of human memory that I find potentially relevant. Two features of particular interest are the distinction between episodic and semantic memory and the notion of consolidation of

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stored information over time. This will be followed by a discussion of how the organization of memory can be applied to different ways of marking past events grammatically, with focus on two types of distinction, viz. evidentiality and remoteness.

1. Tense, aspect, mood, and evidentiality (TAME)

The four labels tense, aspect, mood, and evidentiality (abbreviated TAME) stand for sentence or clause level grammatical phenomena manifested either inflectionally on verbs or periphrastically by constructions usually involving auxiliaries or particles. Similar grammatical markings are found in an overwhelming majority of all languages in the world, and in most of these one or more distinctions are encoded inflectionally. The presence of such inflectional markings is often considered a hallmark of finite verb forms. Together with subject and object markers, the phenomena subsumed under the acronym TAME cover the bulk of inflections on finite verbs and auxiliaries in the languages of the world.

Traditionally, “tense”, “aspect”, “mood”, and (more recently), “evidentiality”, are seen as “grammatical categories”, although it is seldom made clear what the criteria for identifying such categories are. In general, definitions are couched in semantic terms, with the implicit assumption that the notion that the definition delineates will be represented in a distinct and unified way in grammar. This, however, is seldom the case: grammatical forms and constructions often combine elements from more than one of the “categories”, and purported members of the same “category” may behave in very different ways in a grammatical system. For this and other similar reasons, I prefer to see the four labels as identifying notional (conceptual) or semantic domains from which the content of grammatical items is constructed (Bybee and Dahl (1989)). This is not to deny that there are also many cases where one of the domains is relatively dominant in the semantics of some grammatical marker.

The information expressed in the choice of TAME categories is often redundant or marginal to the message the speaker wants to convey. This is highlighted by the fact that the choices that the grammar on one language forces on its speakers may be wholly absent in another. In speaking of a past event an English speaker has to pick one out of a number of grammatical alternatives. In other languages, the set of choices may be quite different. For instance, if a single event is referred to, the English sentences *I have washed the dishes* and *I washed the dishes* normally have just one translation into spoken French: *J’ai fait la vaisselle*. It follows that the processing of TAME in speech production and understanding must be
fast and without conscious attention, in order not to detract from the processing of the main content of the utterance or prolong the production of it—which would in the long run have a negative effect of the chances of survival, or at least success in life, for the individual. At the same time, TAME categories often seem to involve very subtle semantic distinctions that elude adult second language learners and even linguists trying to capture them. Thus, to explain how speakers manage to process TAME categories in milliseconds and without too great cost is a challenge to linguistics and cognitive science.

One possible explanation for the speed and ease by which TAME categories are handled is that they reflect how or from where information is retrieved rather than what is retrieved. That is, TAME would generally not involve any information about an event in addition to that which is anyway necessary to retrieve that event. This suggests that we should investigate the possibility that TAME categories reflect how, or where, the information expressed in a sentence is stored in the brain.

On the whole, TAME systems tend to be more differentiated in the past domain than in the others. Thus, both aspectual and evidential markings are often restricted to past time reference, and this is also where the bulk of remoteness distinctions are found. In fact, most languages in the world have differential marking of past time reference, that is more than one kind of TAME marking when referring to the past.

2. The organization of human memory

How is human memory organized? Two possible ways of making distinctions between different components of memory is by the degree of permanency of the memory storage and by the content of what is stored. Many people will remember from introductory psychology courses that memory can be divided into short term memory and long term memory, but this distinction is crude and even misleading. To start with, information that enters our senses is initially stored for a very short period—maybe half a second—in what is called sensory memory. Some of this information will be transferred to short term memory, which is supposed to last for no more than a few seconds. Long term memory would be responsible for any storage that goes beyond this. However, within long term memory in this rather wide sense recent and not so recent items have different status. Crucially, things that enter long time memory have to be consolidated to survive, which involves creating more permanent memory traces for them. Initially, then, they may exist in a
more preliminary form. We shall have occasion to return to the different components of this process.

The other dimension mentioned above concerned the type of content that is remembered—but it is assumed that the types in question correspond to differences in how the content is handled by our brains and in this sense constitute different memory systems, possibly associated with different parts of the brain. Some of the terminology used here may be confusing for linguists since the terms do not have the meanings they are familiar with. The first dichotomy is between procedural and declarative memory, which roughly corresponds to what philosophers have referred to as “knowledge how” (e.g. how to ride a bicycle) and “knowledge that” (e.g. that snow is white). Sometimes the terms implicit and explicit memory are used, implying that only the second type of memory can be consciously verbalized. It is also this type—declarative or explicit memory—that is our main object of interest here.

Figure 1. Human memory

Two parts of the brain are particularly important for the understanding of memory processes, the hippocampus (or the hippocampi) and the neocortex.

The hippocampus is a brain formation so-called due to its perceived resemblance to a seahorse (see Figure 2). It is usually referred to in the singular although it actually consists of two separate but symmetric formations, one on each side of the brain. It is located in the medial
temporal lobe and is part of the limbic system. The importance of the hippocampus for the formation of new memories is well established.

Figure 2. The hippocampus

The neocortex (pseudo-Latin for ‘new bark’) is the outer layer of the cerebral cortex and is the “grey matter” that makes up about three fourths of the human brain. Saying that something is located in the neocortex thus does not give a very specific address.

2.1 Semantic and episodic memory

Of central importance for the topic of this paper is the further partitioning of declarative memory into semantic and episodic memory.

The term “episodic memory” was introduced in Tulving (1972) for “memory for personal experiences and their temporal relations”. A more up-to-date formulation is found on Endel Tulving’s homepage (http://research.baycrest.org/etulving): “the kind of memory that allows us to “mentally travel” in time, and thus recollect our own past experiences, events we have observed and participated in”. As a term, “semantic memory” is slightly older; semantic memory is usually said to involve more general knowledge about the world, or at least knowledge that is not directly connected to a specific experience. Linguists should note that in spite of the term “semantic”, it is not restricted to knowledge about the meanings of expressions, but also includes non-linguistic knowledge—what is usually called “encyclopedic knowledge”, such as knowing that dogs bark and that the sun rises in the east. Actually, it is rather problematic if these two kinds of memory as usually defined exhaust the domain of declarative memory, but that is something we shall return to.
Tulving connects the distinction between semantic and episodic memory to a distinction between remembering and knowing. (In this connection, he refers to an earlier distinction between “remembrances” and “memoria” drawn by Reiff and Scheerer in 1959.) It may be noted that restricting “remembering” to recall of personally experienced events, as Tulving seems to want to do, is perhaps not exactly in accordance with normal usage, where you can remember all kinds of things. A better distinction might be between “remembering that” and “remembering how”, as in “I remember that/how he left”, where only the latter implies that the speaker saw the event.

In more recent work, Tulving stresses a number of features that he regards as characteristic of episodic memory. In Tulving (2005), he enumerates the following features as central: (i) mental time travel, or “remembering”; (ii) the dependence on a remembering “self”; (iii) the expression of such remembering through autonoetic (“self-knowing”) consciousness, or autonoesis; and (iv) the relation to subjectively apprehended time, or “chronesthesia”. “Mental time travel” is a metaphor for going back in one’s mind to an earlier time, and to mentally relive what happened then (i). This requires a “self” to do the travelling (ii), and this self has to be have a special kind of conscious awareness, for which Turing uses the term “autonoetic consciousness” or, shorter, “autonoesis” (iii): “When you remember an event, however vaguely, you are aware that the present experience is related to the past experience in a way that no other kind of experience is.” Finally, episodic memory has a unique relation to time: in contradistinction to other forms of memory, it allows us to “consciously reexperience past experiences” (iv).

Tulving (and others with him) suggest that episodic memory is a precondition for planning the future—that is, that we mentally “travel in time” into the past when we remember previous experiences and into the future when we plan our actions. This relates to a further assumption about episodic memory—that it has developed relatively recently and that it exists fully developed only in humans. In other words, non-human animals would have exclusively, or predominantly, semantic memory. On the other hand, this claim is somewhat hard to reconcile with the idea that semantic memories are generally derived from episodic memories through generalization.

Conway (2008) has a slightly different take on episodic memory and episodic memories (in the plural). He identifies as a “major, possibly even defining feature” of episodic memory that it “contains information dating to a unique moment in time and not just any time or time in general but rather to the time of an individual experiencing self” (20). More
specifically, episodic memories retain “summary records of sensory-perceptual-conceptual-affective processing” over long periods, are mostly represented as visual images, and they always have “a perspective (field or observer)”.

Conway further suggests that the central function of episodic memories is to “maintain a detailed record of short-term goal processing”, linked to a “window of episodic consciousness” of “constantly changing highly available E[pisodic] M[emories]s moving through time as goals are achieved, revised, and abandoned”. This window is said to extend “back in time to the last period of sleep and forward to the next”. Most memories of daily routine events deteriorate relatively soon (“within 24h of formation”, Conway (2001, p. 1376)), but some episodic memories are integrated with “long-term autobiographical knowledge structures” and can thus be retained in an accessible form for a long time. Conway suggests that this process is what really distinguishes humans from other animals—they would thus have episodic memory, but not the ability to retain it “beyond the window of episodic consciousness”.

Conway points out that “recollective experience”—the experience of remembering—is something that is usually triggered by episodic memories but can also appear independently of it, as in false memories.

The issue of whether episodic memory and semantic memory engage different brain structures is controversial. While it is clear that episodic memory is crucially dependent on the hippocampus but also on the neocortex for storage. Opinions are divided about whether the same is true of semantic memory.

### 2.2 Consolidation of memories

Let us now turn to memory consolidation, which, as mentioned above, is the process whereby a memory obtains a stable representation in long-term memory from having been represented in a more preliminary and labile fashion. In recent years, increasing attention has been paid to the role of sleep in the consolidation process, giving rise to a very active area of research without yet resulting in a clear and stable picture: Conte and Ficca (in press) speak of “an extreme fragmentation of the scenario, where it is even more complex to get a clear picture of the way sleep and memory are connected”—the difficulties are obviously still greater for an outsider. Some lines can be discerned in this “frantically moving landscape” (Conte and Ficca (in press)), however.

In their review of research within the area, Diekelmann and Born (2010) say that consolidation seems to occur most effectively during sleep,
when encoding and consolidation cannot disturb each other. Thus, experimental evidence shows that both declarative and procedural memories are improved after a night’s sleep, or even after a shorter nap. The effects concern not only a general strengthening of memories, but also their integration with other information, the transformation of implicit into explicit knowledge – and highly relevant for the topic of this paper, strengthening of the temporal ordering of memories. The last item is assumed to take place through a replay of memories during sleep (Drosopoulou et al. (2007)). Sleep-dependent consolidation is selective (otherwise we would remember many more things than we do), according to Born and Wilhelm (2012), “memories that are relevant for future actions and goals” are favoured. Memories that are emotionally loaded are also strengthened more than emotionally neutral ones (Payne and Kensinger (2010)).

“The standard two-stage model of memory” (Diekelmann and Born (2010), Born and Wilhelm (2012)) accounts for consolidation by assuming two separate memory stores: a fast learning temporary store—usually identified with the hippocampus—and a slow learning long-term store—identified with the neocortex. A new event is initially encoded in both stores, but then undergoes a process of repeated re-activation resulting in a gradual strengthening of the representation in the long-term store. This consolidation process is sometimes referred to as the “hippocampus-neocortical dialogue”. The competing “multiple-trace theory” (Nadel and Moscovitch (1997)) claims that the hippocampus continues to play an important role over a long time, in particular in the retrieval (or better reactivation) of memories.

3. Evidentiality

3.1 Evidentiality in grammar

“Evidentiality” is relatively new as a grammatical term – it became popular in the 1980’s, although at least the adjective “evidential” had been used before. Evidentiality has often been subsumed under mood or modality, but is nowadays mostly treated separately. Aikhenvald (2004, p. 3) characterizes it as “a linguistic category whose primary meaning is source of information”. It is “a category in its own right, and not a subcategory of any modality”. It is clear that Aikhenvald wants to exclude not only non-grammatical (lexical) specifications of “source of information”, but also those cases where “source of information” is not the primary meaning of some grammatical item. On the other hand, she also
speaks of non-evidential categories with “evidential extensions” expressing “evidential-like meanings”. In keeping with what I said in the Introduction, I will here see “evidentiality” as a semantic domain which can contribute to the semantics of grammatical systems in various ways.

Grammaticalized evidentiality marking tends to always reflect a basic distinction between direct (“witnessed”) and indirect (“non-witnessed”) information sources, where the former notion is understood as “the speaker has some sort of sensory evidence for the action or event he/she is describing” (de Haan (2011b)), “sensory evidence” being sometimes restricted to the visual mode. The types of indirect information that are most commonly relevant in TAME systems are (i) inference and (ii) second-hand or quotative information (i.e. information obtained from another person). These can be marked separately or by a common marker. Many languages restrict evidentiality markings to past time reference.

An often cited example of a distinction between direct and indirect evidentiality in the past is the one represented by the Turkish verbal suffixes -di and -miş (the quality of the vowels varies according to vowel harmony):

(1) Turkish
Ahmet gel-di
Ahmet come-PST.DIR
‗Ahmet came.‘

(2) Turkish
Ahmet gel-miş
Ahmet come-PST.INDIR
‗Ahmet came.‘

According to standard descriptions, -di is used when the event was observed by the speaker, while -miş is used when the speaker infers that Ahmet has come (e.g. from seeing his coat on a hanger) or when someone else has announced his coming. However, grammatical distinctions are seldom entirely straightforward, and -di is the normal choice in written language for relating e.g. historical events that the speaker has obviously not been able to witness. One particular use of the -miş form that is often noted is what is called the mirative use, when the speaker expresses surprise at something (‘oh, Ahmet is here!’).

The two maps in the World Atlas of Language Structures (WALS, de Haan (2011a, 2011b)) that are devoted to grammatical markers of evidentiality show it as being present in 237 languages in a world-wide sample of 418 languages, that is, approximately 57 per cent. However, the
definition of “grammatical marker” in WALS is rather generous, including also weakly grammaticalized cases. With this reservation, it can be noted that evidentials are found in all continents, but with significant variations: they are more common e.g. in the western parts of the American continents, but almost entirely absent in Africa.

There are also differences in how evidential distinctions are realized, or coded. De Haan singles out a type of coding that he calls “Part of the tense system”, which is particularly common in the Balkans and southwestern Asia. These are in general languages where markers of indirect evidentiality have developed out of perfects or resultatives—Turkish is a case in point. It appears that in the languages in question, it is common for the direct-indirect distinction not to be fully grammaticalized in the sense that there is some optionality in the marking of indirect evidentiality. This is linked up with the tricky question of the relationship between evidentiality and what can be called “validation”, that is, the speaker’s commitment to the truth of the statement. As long as the marking is optional, it will tend to obey the Gricean “maxim of relevance”, that is, it will be used only if there is a communicative reason for including it. A good reason for doing so is a desire on the part of the speaker not to make a full commitment to a statement. If the marking is obligatory, on the other hand, there is no room for Gricean considerations.

In other parts of the world, in particular in the Americas, more elaborate systems of evidentiality are frequently found, involving distinctions e.g. between different sensory modalities and/or different kinds of inference. It may be noted that among sensory modalities, visual information is universally given preferential treatment and can be seen as the most “direct” kind of sensory information.

### 3.2 Evidentiality and memory

Let us now turn to the possible connections between grammatical evidentiality marking and the organization of memory. Somewhat surprisingly, standard treatments of evidentiality in grammar do not frequently refer to memory and memory-related notions. It is possible that the focus on “source of information” somewhat detracts from the possibility that such notions may be relevant. What is immediately striking, however, is the close connection between the content of episodic memory and the information expressed by forms marked for direct evidentiality, in particular those that are restricted to past time reference. Thus, the first item in the table “Summary of differences between episodic and semantic memory” in Tulving (1984) is “Information: Source” and the
value for episodic memory is “Sensory”. The generalization that can be made is that whatever is in the speaker’s episodic memory as commonly defined will normally, in all languages which have a distinction between direct and indirect evidentiality, be expressed using direct evidentiality forms. The inverse does not hold, however. Since languages often mark only certain types of indirect evidentiality, sentences containing direct evidentiality forms may very well express information that does not derive from the speaker’s episodic memory. But in particular given the frequent restriction of grammatical evidentiality distinctions to past time reference, there is quite a neat connection between episodic memory and what we can label prototypical direct evidentiality.

But an attempt to align grammatical evidentiality with types of memory rapidly runs into difficulties. As noted above, episodic memory is usually seen as opposed to semantic memory, and together they are considered to make up explicit or declarative memory. But the episodic/semantic dichotomy, as usually defined, leaves a number of stones unturned. Consider the following formulation from a recent handbook (Ryan et al. (2008)):

“Episodic or autobiographical recollection involves re-experiencing a past event that is specific in time and place, while semantic recollection is concerned with facts and general knowledge about the world.”

The problem here is that there are two criteria involved: one is that of personal experience, the other that of specificity in time and place. So what about knowledge about past events that is not based on personal experience? For instance, suppose that going to work this morning, I missed the train. When I finally get to work, my colleague tells me that she also missed the train. I now have knowledge about two events, but only the first one is part of my episodic memory as usually defined. If there are just two kinds of declarative memory, the second has to belong to semantic memory. But in some ways the two memory items are much more similar to each other than to some more typical piece of “general world knowledge” such as the proposition that snow is white. One of the central functions of language is to transmit our personal experiences to others through narratives; when I listen to someone who tells me about an event or episode that he or she has experienced, I create a representation of that event or episode in my brain whose structure is bound to reflect somehow the structure of the original experience, and it is not obvious that the mental imagery that this gives rise to is always clearly different from what we remember from an actual personal experience.
What is important here is the internal structure of the elements of episodic memory—episodes. An episode is typically a set or a sequence of events that are usually tightly connected together temporally, spatially and causally. Episodes are also the normal topic of the oral narratives or stories that we tell each other in daily life, and narrative discourses or texts have a number of properties that reflect this and make them special as a genre, but these properties are to a large extent independent of the source of the narrative (although there are certainly differences between first-person and third-person narratives). In other words, memories that have the same internal structure as episodic memories without deriving from personal experience have an unclear position in the model.

4. Remoteness distinctions

4.1 Remoteness distinctions in grammar

We are used to the idea that languages mark grammatically whether we are talking of the past, the present or the future. But languages may also distinguish by the choice of verb forms or of verbal constructions whether an event took place in the recent or remote past. In a considerable proportion of the world’s languages, this is taken one step further: the choice between two verb forms or constructions may depend on the objective temporal relationship between the point of speech and the time referred to in the sentence. Catalan is a case in point, cf. the following two sentences:

(3) Catalan

\[
\text{Ens hem trobat al mercat aquest matí} \\
\text{PRO.1PL.ACC have.PRS.1PL meet.PP at_DEF.M.SG market this morning}
\]

‘We met at the market this morning’

(4) Catalan

\[
\text{Ens vam trobar al mercat ahí} \\
\text{PRO.1PL.ACC go.PRS.1PL meet.INF at_DEF.M.SG market yesterday}
\]

‘We met at the market yesterday’
In these examples, two different periphrastic constructions are used. The first one, usually called the ‘Perfect’, is formed using the auxiliary have ‘have’ followed by a past participle. It thus looks like the English Perfect and is indeed also used like it, cf. the following example:

(5) Catalan
Us heu trobat tu i mon germà?
PRO.2PL have.2PL meet.PP 2SG and my brother
‘Have you and my brother (ever) met?’

But the Catalan Perfect differs from the English Perfect in that it can also be used in contexts like (5), which contain a definite time adverbial which does not include the present. In such contexts, English requires the Simple Past. The condition here is though that the adverbial refers to the day on which the utterance is made. The Catalan Perfect thus has what we can call “hodiernal past” uses, where “hodiernal” means “referring to the day of the utterance”, or more simply expressed, to “referring to today”. If the time period is further back in the past, the other construction, which is formed using the verb anar ‘go’ followed by the infinitive of the main verb is strongly preferred. (This construction is peculiar to Catalan; the use of a verb meaning ‘to go’ in a past referring TAME construction is typologically unusual.)

Catalan thus has what I will call a remoteness distinction in its TAME system. Some neighbouring languages have an essentially similar system: Spanish (as spoken in Spain, but excluding Latin American varieties), most dialects of Occitan, and the western varieties of Basque. French may have had it at an earlier stage. But except for this area in southwestern Europe remoteness distinctions are rather rare on the Eurasian continent. In other parts of the world, however, they are quite common – I will return to the distribution below. Many languages have TAME systems with a distinction between two degrees of remoteness, like Catalan. As suggested above, the distinction may be either objective, being based on whether the time referred to is before or after some cut-off point definable in terms of an objective time measure, or subjective, being based on the speaker’s assessment of the time as being close or distant in time, without there being a specific cut-off point. If there is such a cut-off point, however, the most frequent case is for it to distinguish a hodiernal past from a pre-hodiernal one. Less often, the cut-off point goes between “yesterday” and “the day before yesterday”, delimiting hesternal past forms from pre-hesternal ones. Thus, objective distinctions are overwhelmingly defined in terms of days, or rather, in terms of the daily cycle, motivating the term circadian tense. Relatively often, grammars specify the cut-off point more
precisely. In what appears to be the most frequent case, ‘today’ includes the preceding night, somewhat unexpectedly perhaps from the point of view of time-reckoning in modern Western culture, but in accordance e.g. with the system found in the Hebrew Bible\(^3\). The year as a unit determining remoteness distinctions is also mentioned for a few languages.

Objective distinctions are often strongly grammaticalized. Thus, it is often stated in grammars that a combination of a certain tense with a temporal adverbial that refers to a “wrong” time period is ungrammatical. For example, Supyire \([\text{spp}]^4\), a Gur (Niger-Congo) language spoken in Mali, distinguishes a hodiernal “recent past” with the preverbal marker \(nî\) from a prehodiernal “remote past” with the preverbal marker \(ná\) (Carlson 1994, p. 329). Combining the recent past with an adverb ‘yesterday’ or the remote past with an adverb ‘today’ yields an ungrammatical result:

\[
(6) \quad \text{Supyire} \\
U \quad nî \quad pa \quad *tánjáà. \\
\text{s/he RECPST come yesterday} \nonumber \\
\text{‘S/he came *yesterday.’}
\]

\[
(7) \quad \text{Supyire} \\
U \quad ná \quad m-pa \quad *níɲjáà. \\
\text{s/he REMPST come today} \nonumber \\
\text{‘S/he came *today.’}
\]

An analogous close to perfect correlation between tenses and adverbials for Catalan can be demonstrated by an Internet search. Thus, whereas the (a) and (d) patterns below yield thousands of hits, the (b) and (c) patterns are only found in a couple of cases or not at all:

\[
(8) \quad \text{a. El govern … ha anunciat avui…} \\
\text{b. El govern … va anunciari avui…} \nonumber \\
\text{‘The … government announced today…’}
\]

\[
\text{c. El govern … ha anunciari ahír…} \\
\text{d. El govern … va anunciari ahír…} \nonumber \\
\text{‘The … government announced yesterday…’}
\]

These examples also illustrate the important point that remoteness-sensitive tense markers are not in complementary distribution with temporal adverbials in general: they often cooccur with them.
Anecdotal support for the reality of combinability constraints is found in stories of spontaneous corrections by native speakers. In his grammar of Eipo [eip], a Trans-New Guinea language spoken in the Indonesian part of New Guinea, Heeschen (1998) says that speakers’ comments on TAME categories “leave no doubt”: “Repairs and paraphrases are unequivocal.” He tells the story of how he was corrected when using a post-hodiernal, rather than the hodiernal future, of an aeroplane that was just to land.

As an example of a system with a primarily subjective remoteness distinction, we may take South Conchucos Quechua [qxo], spoken in Peru (Hintz (2007)), where the two suffixes -ra- and -sha- are said to differ in subjective remoteness, -sha- marking more recent past. In the following conversation (Hintz (2007, p. 248)), the same situation is referred to first using -ra-, then using -sha-:

(9) South Conchucos Quechua
Guillermo:
Mana-ku aywa-ra-n tiyu-ntsi: Gumi:chu?
no-Q go-PST-3 uncle-PL.1INCL Gomer
‘Didn’t our uncle Gomer come?’

Rita:
Mana. Aywa-ya-sha-tsu tsay-kuna. ni pi-pis,
no go-PL-RECPST.3-NEG that-PL nor who-EVEN
‘No. They didn’t come, not one of them.’

Hintz gives an explanation in terms of differences in emotional involvement:

“Rita’s emotional involvement and Guillermo’s lack of emotional involvement influenced their choices of tense marker”.

Many TAME systems distinguish more than two degrees of remoteness in the past. Most commonly, there are three terms: hodiernal, hesternal, and remote, where the hesternal past is used to speak of events that took place the day before the utterance or maybe one or two days earlier and the remote past is used for everything that took place before that. There may also be an immediate past, referring to what happened just before utterance time. Even larger systems are found, albeit less frequently. Martin (2010) describes Creek [mus], a Muskogean language spoken in the United States, as having a system with five past tenses, as shown in the following table:
Table 1. Creek Indicative Tense Forms of *nis-* ‘buy’

<table>
<thead>
<tr>
<th>Tense</th>
<th>Form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future</td>
<td><em>nis-áli:-s</em></td>
<td>‘he/she will buy it’</td>
</tr>
<tr>
<td>Prospective</td>
<td><em>nis-áha:n-is</em></td>
<td>‘he/she is going to buy it’</td>
</tr>
<tr>
<td>Present</td>
<td><em>ni:s-ís</em></td>
<td>‘he/she is buying it, bought it (up to a few seconds ago)’</td>
</tr>
<tr>
<td>Past 1 perfective</td>
<td><em>níhs-is</em></td>
<td>‘he/she bought it (today up to last night)’</td>
</tr>
<tr>
<td>Past 1 imperfective</td>
<td><em>ni:s-êy-s</em></td>
<td>‘he/she was buying it (today up to last night)’</td>
</tr>
<tr>
<td>Past 2</td>
<td><em>nî:s-ânk-s</em></td>
<td>‘he/she bought it (yesterday to several weeks ago)’</td>
</tr>
<tr>
<td>Past 3</td>
<td><em>nî:s-imát-s</em></td>
<td>‘he/she bought it (several weeks to a year or so ago)’</td>
</tr>
<tr>
<td>Past 4</td>
<td><em>ni:s-ánt(a)-s</em></td>
<td>‘he/she bought it (long ago, at least several years)’</td>
</tr>
<tr>
<td>Past 5</td>
<td><em>ni:s-atí:-s</em></td>
<td>‘he/she bought it (very long ago)’</td>
</tr>
</tbody>
</table>

However, since the Present also has an immediate past use, Creek could be said to distinguish six degrees of remoteness. (This represents an older form of the language, apparently no longer current. Modern speakers are said not to use Past 4 actively.)

Creek as described by Martin illustrates a general tendency: remoteness distinctions other than that between ‘today’ and ‘before today’ (and to some extent between ‘yesterday’ and ‘before yesterday’) tend to be less well-defined and precise. This means that one and the same form may be more precisely defined at one end than at the other: quite frequently, definitions such as “yesterday or a couple of days earlier” are found in grammars. In addition, especially for the most remote tenses, it may not always be easy to see if a form differs from the others in the paradigm in terms of remoteness or if it maybe rather something else. Thus, Martin notes that Past 5 is often associated with legends, and says that one might wonder if it does not indicate an unwitnessed event or state. These facts already make the distinction between “objective” and “subjective” distinctions seem less water-tight, suggesting that perhaps we are dealing with a scale rather than a clear binary distinction. This receives support from the frequent statements in grammars that the boundaries between the tenses are not rigid but can often be transgressed in usage. Martin describes how tense choice may vary within one and the same narrative text, in spite of references being made to the same period of time. Thus, a
narrative “in a Past 5 time frame”, where verbs are generally in Past 5, may also contain Past 4 or even Past 3 verb forms, as “authors sometimes shift to more recent tenses in first-person contexts to give more immediacy to a description”. Martin compares this to similar tendencies in other languages, including South Conchucus Quechua, which was mentioned above as a language with a primarily subjective remoteness distinction.

Martin does not provide any examples of pre-hodiernal tenses being used of ‘today’, or hodiernal tenses being used of ‘yesterday’ or earlier. Thus, it may be said that the tenses he is speaking of are not fully “objective” anyway, since their cut-off points are somewhat vague. But there are fairly clear examples of subjective considerations being relevant also in the case of tense distinctions that are based on an objective cut-off point. We saw above that Supyire has a distinction between ‘today’ and ‘yesterday’ that is strictly enforced when there is an explicit temporal adverbial. However, directly after having given the examples quoted as (6)-(7) above, Carlson (1994, p. 333-334) says that even if speakers themselves characterize the Recent Past as referring to events that “happened today”, they do not adhere to their own definition. Thus, three out of nine recorded examples of the Recent Past refer to more remote events. (In an example quoted by Carlson, the event reported in the Recent Past took place almost a hundred years earlier.) “Apparently, the use of nî renders the event emotionally closer, more immediate.” Although Carlson does not say this explicitly, the kind of flexibility must be understood as being possible only when there is no explicit temporal adverbial. It may be noted that something similar holds of past-referring uses of the present tense in English and other languages traditionally called “the historical present”.

The general conclusion here is that subjective and objective criteria for remoteness can happily coexist in the same system and even for one and the same form, and that there is a continuum rather than a sharp borderline between them.

There is also another twist on the use of objective remoteness distinctions. According to some grammars, a hodiernal tense may refer not only to events that took place ‘this day’ but also to events that happened during ‘this season’ or ‘this year’, or generally, ‘this time period’. For this provision not to mess up the system totally, it has to be restricted to cases where some such period has been referred to already. Another somewhat similar mechanism is when a hodiernal tense is used when reference is made to the last member of a sequence of similar events. Thus, Kiso (2012, p. 175) reports the use of the hodiernal past in Citumbuka [tum] (a Bantu N language spoken in Malawi and Zambia) about the weather on the
last Sunday, which she explains by the fact that the topic of the conversation was the church service on the three Sundays preceding the time of speech.

Remoteness distinctions are found in TAME systems all over the world, although there are some areas and families where they are more common than elsewhere. The largest concentrations are found in sub-Saharan Africa, New Guinea, and South America. The bulk of the languages in Africa with remoteness distinctions belong to the Niger-Congo family, although there are also a number of examples from Khoisan, Nilo-Saharan, and Afro-Asiatic. Within Niger-Congo, the largest numbers are within the Bantoid languages, in particular the Grassfields languages in Cameroon and the (Narrow) Bantu languages, which dominate the African continent south of the Equator and where a clear majority of the languages show remoteness distinctions. There is evidence of areal influence from the Niger-Congo languages, especially on the TAME systems of Nilo-Saharan languages. In New Guinea, the majority of the languages with attested remoteness distinctions belong to the large Trans-Guinea family but there are also many cases from other groupings. In South America, remoteness distinctions are spread out over many of the continent’s language families but are usually restricted to a minority of the languages in a family with a few exceptions such as Panoan, spoken in Peru, where remoteness distinctions are found more generally. More scattered examples are found in North America and Australia. On the Eurasian supercontinent and the adjacent parts of the Pacific where Austronesian languages are spoken, there are surprisingly few clear examples of remoteness distinctions; an exception is the area in southwestern Europe discussed above. It is hard to give a reliable estimate of the proportion of the world’s languages where grammaticalized remoteness distinctions are found, but on the basis of my data from grammars I would make a qualified guess of at least 15 per cent.

As noted above, remoteness systems vary considerably between languages, both with respect to the number of distinctions made, and with respect to the weighting of subjective and objective criteria. Interestingly, however, the range of variation seems to be more or less the same in different parts of the world; in all the major areas enumerated above we find systems with few and systems with many degrees of remoteness and systems with and without objectively defined cut-off points. The Grassfields languages are probably the clearest exception to this generalization; the overwhelming majority of the languages that have been described in this group of about 65 languages have TAME systems with very similar structures (although the markers used vary extensively)
involving remoteness distinctions both in the past and in the future, normally marked by preverbal particles.

As has already been mentioned, reference to the day of utterance (‘today’) has a special role in TAME systems with remoteness distinctions, and for convenience I shall refer to the property of taking place on the day of utterance as ‘hodiernality’. This will include also reference to the segment of the day that follows the utterance, that is hodiernal future, but as before I shall here focus on past time reference. In earlier work, I made the audacious claim that the cut-off point between ‘today’ and ‘yesterday’ was always present in systems with objective remoteness distinctions; this is clearly not the case, as a sizeable number of languages lack a hodiernality distinction but instead honour the cut-off point between ‘yesterday’ and ‘before yesterday’. Relative to the languages with hodiernality, however, they do constitute a small minority, slightly more than ten per cent in my material. Now, hodiernality can be relevant in more than one way; it is not always the case that there is a dedicated hodiernal past in the system. In addition to forms and constructions being ambiguous between hodiernal pasts and perfects, we find a number of cases where the same form is used for present time reference on the one hand and hodiernal past and/or future reference on the other. Thus, in Fore [for], a Trans-New Guinea language spoken in Papua New Guinea (Scott 1978) the present tense is used about “any time from the present moment back to and including the previous night”.

A further possibility is that a language has a hesternal past that is opposed to a general past; since the forward bound of such a form is between ‘today’ and ‘yesterday’ hodiernality is a criterion here too. Excluding the last type, which is found only in a handful of languages, there is support in grammatical descriptions for hodiernality being grammaticalized in around 280 languages, while there are around 25 languages where the major cut-off point is between ‘today’ and ‘yesterday’.

4.2 Remoteness distinctions and memory

Can grammatical remoteness distinctions be somehow related to the organization of human memory? More specifically, do choices between different TAME forms in languages with grammaticalized remoteness distinctions reflect how (or where) the memories of events are stored in the brain?

How do we know when a past event took place? It is highly implausible that events come with “timestamps” (like digital photos) in
our minds. Rather, we have to assume that the processes involved in determining the time of past events are quite complex. Friedman (1996) distinguishes two kinds of such processes: “location processes” and “distance processes”. Location processes are said to rely on contextual information that is associated with an event, and relate it both to other events and to our knowledge of “social, natural, and personal time patterns” (p. 3). For instance, I may remember visiting a restaurant in a certain city, and that it was snowing at the time. I may then infer that the event took place in the winter of the year when I lived in that city.

Distance processes use information that directly relates to the amount of time that has elapsed since the event took place. For instance, if memories become weaker over time, the strength of a memory could be used to locate it. Experimental evidence suggests that both kinds of processes are used in dating events. However, the value of distance processes is limited in that they cannot give precise information about times, in particular for more remote events: “Only for the past weeks do we have reasonably accurate information, and beyond a few months only very gross differences in the ages of memories can be detected.” (p. 37) Thus, whenever we want to go beyond those limitations, recourse has to be made to location processes. On the other hand, these are more costly in processing terms, since they may involve potentially complex inferences. This is relevant in view of what I said in the beginning of the paper concerning the necessity for the processing of TAME categories to be fast and “cheap”. This would suggest that the information necessary for choosing remoteness-dependent TAME forms is obtained primarily through distance processes. This is also compatible with the low degree of precision of remoteness distinctions, in particular the more subjective ones—“very gross differences in the ages of memories” are sufficient to determine whether an event should be seen as “recent” or “remote”.

Descriptions of remoteness distinctions are sometimes formulated in terms of what the speaker remembers or how vivid or fresh something is in their memory. In several cases, this applies to the mid term of three-member systems, which then are delimited objectively forward (‘before today’) but subjectively backward. Thus, about Toaripi [tqo] and Orokolo [oro] (two Trans-New Guinean languages spoken in Papua New Guinea), Brown (1972, p. 334) says that the recent past is used of events “from yesterday up to about a fortnight ago” but that there is no “hard and fast division”: “What separates the recent from the remote past is whether the event be fresh in the mind or not”. Intuitively, a more vivid memory ought to feel “closer”, but I have not been able to find any clear corroboration of that in the experimental literature.
Given that objective and subjective remoteness distinctions seem to flow into each other in actual usage, there ought to be a close relationship between them. This is related to several further questions. One concerns the diachronic explanation of objective remoteness distinctions. It is not too surprising that a time adverbial with a precise meaning such as ‘today’ or ‘yesterday’ may grammaticalize into a tense marker, but rather more unexpected that a construction such as a perfect may develop into a hodiernal past, that is a TAME item whose meaning involves an objective time measure, given that hodiernality – the restriction to today’s events— is not at all part of the original meaning of the construction. Further, why is hodiernality so pervasive in remoteness systems? Why do so many languages – perhaps as much as 10 per cent of the world’s languages grammaticalize the distinction between ‘yesterday’ and ‘today’?

In Dahl (1983), I discussed remoteness distinctions from a typological point of view, including a section called “Remoteness distinctions and the organization of memory”. I quoted Chafe (1973) and his postulation of three stages of memory—surface, shallow, and deep, trying to relate them to the degrees of remoteness found in TAME systems. Chafe did not discuss TAME systems concretely although time adverbials figure prominently in his argument. The paper predates recent developments in memory research, but some of Chafe’s observations stand out as perceptive in the light of later findings, for instance when he says that “sleep may play an important role in the transfer from shallow to deep memory”. Chafe’s description of the stages do not in all respects fit what we find in TAME systems, sometimes the hodiernal-prehodiernal distinction appears to go between “surface” and “shallow”, sometimes between “shallow” and “deep”.

My conclusion in Dahl (1983) was that it would be rather strange if grammatical remoteness distinctions “did not reflect any general properties of human cognition and that the uniform character of remoteness systems from different parts of the world constitutes a challenge for cognitive psychology” (120). However, when writing my paper, I was not aware of any research that would answer the question “whether there is any qualitative differentiation of information within long-term memory”, but “[t]he dominant role of the hodiernal:nonhodiernal distinction … makes one wonder if anything special happens to things when they have been stored in memory for 24 hours”. Even if I would now rather say “when they have been stored in memory overnight”, I think that the question still stands, and that we hopefully are a bit closer to the answer today.

An account of remoteness distinctions in Bantu languages partly in terms of the organization of memory is presented in Muzale (1998) and
Hewson, Nurse, and Muzale (2000). A key concept here is “retentive memory”, which is “the memory of the stream of consciousness that is in the process of being recorded” or “the working memory of consciousness”, and is part of present experience: “the memory that allows us to write or speak a sentence, or continue an explanation or a paragraph, without getting confused or losing the way”. “Retentive memory” in this sense is taken to define the referential scope of the hodiernal past in a language such as Ruhaya [hay], a Bantu J (Niger-Congo) language spoken in Tanzania, motivating calling this form “the Memorial Present”. According to “the conventions of the Ruhaya tense system” the retentive memory extends “all the way back to the last sleep of the community, i.e., to the point where consciousness is interrupted by sleep”. We can see that some of these formulations come quite close to Conway’s understanding of “the window of episodic consciousness” (see above). A couple of things detract from the alignment of the notions in question, however. One is that what Hewson et al. call “the retentive memory” plays at once both the role of working memory and a memory that extends over a whole day—which does not seem to be in accordance with the usual understanding of working memory. Another is the claim that the range of “the retentive memory” is dependent on language-specific conventions.

The possible connecting link between hodiernality and human memory is sleep. As I mentioned above, sleep is seen as crucial to the process of memory consolidation. Sleep, obviously, is also what normally separates the hodiernal from the pre-hodiernal temporal domain. There is some evidence that the actual time of sleep may be more important than e.g. the sunset or sunrise for hodiernality. Thus, Crane (2011, p. 237) says of Totela [ttl], a Bantu K language spoken in Zambia, that “the hodiernal past is used for anything that occurred after the time of sleeping for the speaker, whether that speaker went to bed early or late”. Last night’s supper, on the other hand, is reported in the prehodiernal past although it always happens after sunset (Thera Crane, pers. comm.). It may well be that Crane’s characterization will be valid for other languages, too, since apparently grammarians have seldom tried to investigate the issue in any detail. Crane notes (236) that “[i]t may be that a portion of the descriptive works claiming the day’s start at sunrise are conflating the typical start of the day’s activities (and memories) with the actual start of the domain of hodiernality marking.”

A further somewhat curious fact that may or may not be relevant here is that hesternal past markers are sometimes diachronically derived from verbs meaning ‘to sleep’ (e.g. Fyam [pym] (Plateau (Niger-Congo), Nettle
In languages like Totela, where the boundary between hodiernal and prehodiernal past is the point in time when the speaker went to sleep the day before, a prehodiernal past will typically refer to an event that has been consolidated in episodic memory during a full night’s sleep. Does this mean that we can conclude that hodiernality distinctions are directly based on differences in consolidation status? I do not want to claim that there is any solid evidence for such a conclusion, but I think the hypothesis that consolidation status has some role to play here is not implausible. As was noted above, the consolidation process involves both selection—in the sense that only a small proportion of all memories make it to long-term storage—and integration of the selected memories in larger knowledge structures. Consolidated memories will thus not only be distributed in the brain in a different way but will also have a different character in various ways, making consolidation status a plausible candidate for grammatical marking.

Obviously, however, the picture is more complex. One difficulty is that consolidation is a process that may take a longer time than just one night to be complete. It is possible that what is at stake is not so much that prehodiernal events should be fully consolidated as that hodiernal events should occur within what Conway calls “the window of episodic consciousness”, which, as we saw above, is supposed to stretch back to the last period of sleep and forward to the next.

There are of course also other possible explanations of the dominant role of hodiernality among objective remoteness distinctions. In Dahl (1983, p. 120), I concluded the discussion of the possible connections between hodiernality and memory by saying that “it is probably safer to hypothesize that the explanation is simply that the day is the most salient and constant time measure in just about any human culture”. It can be added that the daily cycle is extremely important not only in culture but also in biology, driven in both animals and plants by what is called the “circadian clock”. Sleep forms a natural divide between the active periods, and it could be argued that it is quite natural that this should be reflected in the way we structure time. On the other hand, if we start analyzing the functions of sleep, it is hard to avoid considering the effects it has on memory, and then we are soon back at where we started.

A question that arises directly in this connection is how to explain hodiernality with respect to the future. Grammatical distinctions between ‘today’ and ‘tomorrow’ are less common than such distinctions between ‘today’ and ‘yesterday’, but they do exist in a non-negligible number of
languages. It may seem that these cannot be explained in terms of episodic memory, but Conway (2008) argues that “the window of episodic consciousness” extends also into the immediate or near future where episodic memories “in which memories were formed wait for the cue that will trigger their recall and execution”.

Going in the other direction, we may also ask how to explain the other major type of circadian tense distinction, that between hesternal and pre-hesternal past. In the common three-term system with hodiernal, hesternal and remote pasts, hesternal pasts can be seen as focusing on those memories that are neither in the “window of episodic consciousness” but have not yet been bleached enough to feel as remote. It appears that the backward cut-off points of hesternal pasts are significantly less fixed than those of hodiernal pasts; a common formulation is that they refer to “yesterday or a few days back”. More problematic are probably those systems that have a hesternal:pre-hesternal distinction but no hodiernal: pre-hodiernal one; this is a relatively small group but still has to be accounted for. One possibility is that this kind of system diachronically represents the initial stage of a transition between a hodiernal past tense and a more general past tense, a process that is observable in the Romance languages.

5. Perfects and event reification

So far, I have mainly discussed two types of distinctions that frequently determine choices in TAME systems—evidentiality and remoteness. At least at first sight they seem quite different, although both have potential links to the organization of human memory. But there are some further circumstances of interest. One is that there is a partial complementarity in their geographical distribution. Thus, remoteness distinctions, in particular circadian ones, are common in sub-Saharan Africa and New Guinea, while occurring in a rather quite restricted way in Eurasia. Evidentiality marking, on the other hand, is almost absent in Africa and comparatively infrequent in New Guinea but frequent in Eurasia. On the other hand, no such complementarity is apparent in Australia or the Americas. The other thing to be noted is that indirect evidentials and hodiernal or recent pasts share a common diachronic source, viz. perfects. These two observations may not be unrelated: the development from a perfect appears to be more common in the Old World (Africa and Eurasia) than in the rest of the world, and the complementarity in this area might be at least partly explainable by the unlikelyhood of a perfect developing in two directions at once. Whatever the case may be, it
may be worthwhile considering if there are also any connections between memory organization and the semantics of the perfect.

The perfect, exemplified by the English *have* + past participle construction, is a type of TAME construction with a notoriously elusive semantics, and there is no generally accepted account of it. Opinions are divided both about the number of different uses or meanings that have to be distinguished and about the nature of these meanings.

In the survey of perfects in the world’s languages in WALS (Dahl and Velupillai 2011), perfects were found in 108 out of 222 languages, with a concentration to the Old World. Only constructions that had the following uses were counted as perfects:

1. a **resultative** use: speaking of an event, often but not always a recent one, which has results holding at the temporal reference point:

   (10) Someone has stolen my purse! (=the purse is no longer in my possession);

2. an **experiential** use, speaking of a certain type of event that took place one or more times over an interval of time, typically one that extends up to the temporal reference point:

   (11) I have seen worse things in my life.

   It should be noted, however, that in addition to results which are directly inferrable from the meaning of the verb, as in (10), perfects also are used of events that have repercussions which may require contextual knowledge to be inferred:

   (12) The gong has sounded [so it’s time for dinner].

   The term “current relevance” is often used to describe the condition that the event has results or repercussions at the temporal reference point (which is most often identical to the moment of speech). In Dahl and Hedin (2000, p. 392), it was argued that “current relevance” had to be defined relative to the discourse “in that the speaker portrays the consequences of an event as somehow essential to the point of what he is saying”.

   Diachronically, perfects often develop out of dedicated resultative constructions. These differ from perfects in that they can only be used to
speak of cases like (10), where the result involved is one that is directly inferrable from the meaning of the verb.

In the other direction, perfects can, as mentioned already, develop into other types of TAME forms or constructions, such as hodiernal or recent past, or even more general pasts or perfectives. This development, which is well-known from many languages in Europe and elsewhere, tends to involve a further weakening and in the end, an elimination of the current relevance condition. We can also see it as a stepwise shifting of the focus from the resulting state to the event, where perfects display a somewhat precarious balance in paying attention to both sides. This takes us to a consideration of the relationship between states and events.

In the simplest case, an event is a transition between two states. For instance, a light bulb can be either in an “on” state or in an “off” state. If the light bulb is “on” at a certain moment, and then “off” at the following moment, it can be described as the light bulb going off, that is, as an event. Moreover, if we are shown two pictures of the light bulb in rapid succession, with the first one showing it as “on” and the second as “off”, we cannot help experiencing it as an event, although strictly speaking, what we have been shown is simply two states. More dramatically, if we are shown in rapid succession two pictures of the same object differing only in the location of the object, we cannot help seeing the object as jumping from one place to another.

What happens is that we **reify** the event—make it into a “thing”; another way of expressing it is to say that the event is a **construct**. (For a more detailed discussion of these concepts, see Dahl (forthcoming). Applying this to the diachronic development resultative→perfect→past, it can then be suggested that we are dealing with a **scale of event reification**, where the event becomes gradually more clearly reified as we move from left to right.

What I have said here can now be related to the organization of memory in a couple of ways. When we watch a movie, the projector shows a series of static pictures, but these never enter our consciousness, what we see on the conscious level is a sequence of events. In other words, the reification of these events takes place at a sub-conscious level, presumably in our sensory memory. But if the interval between the pictures is too long, the sub-conscious reification cannot take place. Similarly, if we are in a room when the light goes out, we experience it as an event; if, on the other hand, we leave the room briefly, finding on returning that the room is dark, the experience is different: what we perceive is the state of darkness, which we can then compare to the previous perception of the room with the light on, which has been stored in
Fleck (2003), describing the evidentiality system of Matses [mcf], a Panoan language spoken in Peru, characterizes the experiential or direct evidential as referring to “a situation where the speaker detects the occurrence of an event at the time it transpires (or the state at the time it holds true)”. Thus, he connects the distinction between direct and indirect evidentiality to the existence of a time lapse between the event and the cognizance of it. But the distinction between the perfect and other TAME forms may also sometimes hinge on similar considerations. At least in my native Swedish, there is a fairly clear difference in naturalness between the following two sentences in the situations described above:

(13) Swedish
Ljuset slocknade
light.DEF go_out.PST
‘The light went out’

(14) Swedish
Ljuset har slocknat
light.DEF ha.PRS go_out.SUP
‘The light has gone out’

According to my intuitions, (13) with the past tense, is more natural if you are in the room when the event takes place, (14) if you enter it only afterwards. I suspect that the same may be true at least of some varieties of English.

The notion of reification is also important for what happens to memories later on. Consider an event such as the one described in (10). You are on holiday abroad and suddenly notice that your wallet is missing—that is, what you notice is the absence of the wallet, a static condition rather than an event. By comparing this perception to the stored mental image of the wallet being in your pocket a few minutes ago, you can reconstruct the event that must have taken place. And when the information is stored in your long-term episodic memory it is most probably in terms of a reified event (someone stole your wallet) rather than a state (your wallet was gone). Furthermore, this event will be integrated in a larger episode, including going to the police station, calling the credit card company, borrowing money from your travel companions etc. So when saying “Last summer, my wallet was stolen” you are probably thinking of the whole episode.
We may now notice that when a perfect expands its domain of use, narratives tend to be among the last contexts to be conquered—this has even been used as a negative criterion in identifying perfects cross-linguistically (Lindstedt (2000)).

In general, it appears that perfects tend not to be used of events that are consolidated in episodic memory, even if this cannot be used as a general criterion. If we now return to the TAME markings that perfects tend to develop into, indirect evidentials and hodiernal/recent pasts, we can see that they also share this property, although they can be said to highlight different reasons for something not to be taken from long-term episodic memory: in the case of indirect evidentials, because they are used when something is not “remembered” in Tulving’s sense of the word; in the case of hodiernal/recent pasts, because they are used of events that have not yet been fully consolidated.

**Conclusion**

In this paper, I have pointed to possible connections between distinctions made in the TAME systems of human languages and the organization of human memory. In particular, I have tried to highlight the potential significance of the process by which an event goes from being perceived or inferred to being integrated in episodic memory for the explanation of the pervasive phenomenon of differential past marking in languages. I suggested a possible reinterpretation of evidentiality distinctions in terms of the memory status of the information conveyed in a sentence. I further pointed to the role of sleep both as defining cut-off points in remoteness systems and in memory consolidation. Finally, I noted the connection between ways of referring to past events, their degree of reification and their memory status.

I hope readers will share my view that the proposed connections between grammar and memory are suggestive. However, I am the first to admit that more solid evidence is highly desirable. This most probably demands the development of experimental methods for studying the relationship between TAME marking and the processing and storage of information about time and events. Ideally, such methods could give new insights for both linguists and psychologists.
References


TAME and the Organization of Human Memory

http://wals.info/feature/78A.


**Notes**


2 The interlinear glosses are in accordance with the Leipzig Glossing Rules (http://www.eva.mpg.de/lingua/resources/glossing-rules.php). Examples quoted from other sources have been adjusted accordingly, which means that the labels of grammatical morphemes sometimes differ from those in the source.

3 Cf. “And the evening and the morning were the second day.” (Genesis 1:8, King James Version)

4 The ISO 639-3 code of a language is given in square brackets after the name.

5 This use of the expression "retentive memory" appears to be idiosyncratic -- I have failed to find any clear parallels elsewhere.