

Evidentials as Generalized Functional Heads¹

Peggy Speas

University of Massachusetts, Amherst

pspeas@linguist.umass.edu

0. Introduction

According to Aikhenvald (2004), approximately one quarter of the world's languages have specialized morphemes for expressing the type of evidence that a speaker has for an assertion. In some languages, these morphemes are obligatory. Evidential morphemes like those seen bolded in (1) - (4) express information that is not obligatorily expressed in English, and seem to express pragmatic information about the Speaker's source of information for an assertion, yet they also share semantic properties with epistemic modals, in that they sometimes express inference and they seem to imply varying degrees of certainty on the part of the Speaker.

1. a. wiki-caxa-**w** 'It's bad weather (directly experienced)' Makah
b. wiki-caxa-**k'u** 'It was bad weather'
c. wiki-caxa-k-**pid** 'It looks like bad weather (inference from physical evidence)'
d. wiki-caxa-k-**gad'i** 'It sounds like bad weather'
e. wiki-caxa-k-**wa.d** 'I'm told there's bad weather'
f. wiki-caxa-k-it-**wad** 'I'm told it was bad weather'
2. a. wañu-nqa-paq-**mi** 'It will die (I assert)' Quechua
b. wañu-nqa-paq-**shi** 'It will die (I was told)'
c. wañu-nqa-paq-**chi** 'It will die (perhaps)'
3. a. K'oŋ gis yi-ge bri-pa-**red** 'S/he wrote a letter (it seems)' Tibetan
s/he ERG write-Perf-EVID
b. K'oŋ gis yi-ge bri-pa-**son** 'S/he wrote a letter (I saw it happen)'
s/he ERG write-Perf-EVID
4. a. Nɔ-màq àj òq-àŋ dì-é 'You(pl) will beat him' Akha
you-PL he-OBL beat-**NONSENSORIAL**
b. Nɔ-màq àj ɔq-àŋ dì-**ŋà** 'You(pl) will beat him (I see it now)'
you-PL he-OBL beat-**VISUAL**
c. Nɔ-màq àj òq-àŋ dì -**nja** 'You(pl) will beat him (I guess from
you-PL he-OBL beat-**NONVISUAL** sound of beating)'

In many languages, Evidential morphemes are obligatory and mutually exclusive, forming a discrete morphosyntactic system. Various authors argue convincingly that in languages where

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Evidentials are obligatory, they cannot be subsumed by any other grammatical system. (See Chafe and Nichols (1986), de Haan (1999, 2001), Lazard (1999), and Aikhenvald (2004). See also Rooryck(2001a,b) for an overview of the issues regarding Evidentials.) Rather, Evidentials represent a coherent conceptual category, which may be grammaticized as a coherent morphosyntactic category. Note that this does not mean that all expressions of information source in all languages form a distinct category. Just as some languages have time expressions like ‘tomorrow,’ ‘soon,’ ‘later,’ ‘before,’ ‘last week,’ etc. but do not have Tense morphology, some languages (like English) have adverbs, predicates, adjectives, etc. for expressing sources of information but do not have an obligatory morphosyntactic Evidential category. When I use the term “Evidentials,” I am referring to the grammaticized morphosyntactic category present in some but not all languages.

More familiar morphosyntactic categories, such as Tense, Mood, Verb, etc., are generally considered to be semantically homogeneous: All Tense markers denote relations between times, all Verbs denote functions, etc. Moreover, semantic analyses of the familiar categories attempt to distinguish each morpheme’s denotation from any pragmatic features that may be associated with it. However, most formal analyses of Evidential morphemes treat them as semantically heterogeneous markers of a combination of semantic and pragmatic features. For example, Garrett(2001) treats the Direct Evidential in Tibetan as a demonstrative assertion marker and the Indirect as a performative epistemic modal. Similarly, Faller (2002) analyzes Quechua Evidentials as markers of illocutionary force, but some of them simply affect sincerity conditions, while others include an epistemic modal operator.

My goal in this paper is to outline an analysis of Evidential morphemes that is semantically homogeneous and does not combine semantic and pragmatic features. I will argue that in addition to being more restrictive, a homogeneous analysis sheds light on the proper boundaries between semantics and pragmatics and allows us to dispense with the problematic notion of “evidence” as a primitive. Of course, it is ultimately an empirical issue whether discrete morphosyntactic categories correspond to discrete semantic categories and whether there are morphosyntactic categories that denote combinations of semantic and pragmatic features. The system I will propose highlights certain symmetries in the grammars of tense, mood and person. I will argue that these symmetries are even more pervasive than previously thought, and will suggest that they offer new insight into the nature of Functional categories.

Specifically, I will argue that Evidential morphemes encode a relations among three situations: the situation of which a proposition is true, a Reference Situation and the Discourse Situation. Parallels between Evidential systems and Tense/Aspect systems lead me to suggest that all Functional heads encode basically the same relations, which may be seen as fundamentally configurational.

1. Evidential Systems

Evidential morphemes indicate the *source of evidence* for an assertion. In some languages, marking for source of evidence is obligatory, part of a paradigm of verbal or auxiliary morphemes. For example in Makah, every sentence must be marked with a morpheme

indicating how the speaker knows the sentence to be true. The evidential marker may indicate that the sentence is known from direct experience, (present (5a) or past (5b)), inference from direct physical evidence (5c), inference from more indirect evidence (5d) or hearsay (present (5e), or past (5f)). Smaller paradigms with similar markers are found in a variety of languages, as the Quechua, Tibetan and Akah examples in (2) - (4) show.

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|----|-------------------------------|----------------------------------------------------------------|-------|
| 5. | a. wiki-caxa- <u>w</u> | 'It's bad weather (directly exp.)' | Makah |
| | b. wiki-caxa- <u>k'u</u> | 'It was bad weather' | |
| | c. wiki-caxa-k- <u>pid</u> | 'It looks like bad weather (inference from physical evidence)' | |
| | d. wiki-caxa-k- <u>gad'i</u> | 'It sounds like bad weather' | |
| | e. wiki-caxa-k- <u>wa.d</u> | 'I'm told there's bad weather' | |
| | f. wiki-caxa-k-it- <u>wad</u> | 'I'm told it was bad weather' | |

Cinque (1999), deHaan (1999) Lazard (1999) and Aikhenwald (2004) show that it is important to distinguish markers of source of evidence from markers of other speaker attitudes, such as surprise (i.e., Mirativity), degree of certainty and expectations about hearer's knowledge. In languages like those above, each sentence must bear a morpheme marking source of evidence, while these other notions would be marked separately. Although degree of certainty can often be inferred from evidence type, this is not an inherent part of the meaning of Evidentials.² (See Chafe and Nichols 1986)

Since evidential morphemes are generally treated as adverbial-type markers of pragmatic information, we would not expect any particular limits in the number or type of possible morphemes. However, Willett (1988) has shown that in languages where evidential morphemes are obligatory, the paradigm never contains more than about four members, and the basic categories encoded are the same across languages. Willett and others have noted that these categories fall into an implicational hierarchy, and that personal experience is in some sense "closer" to the speaker, and hearsay is the "farthest" from the speaker, and in fact involves reference to some other discourse.

6. Basic categories of evidentiality (Willett 1988:57):

personal experience >> direct (eg. sensory) evidence >> indirect evidence >> hearsay.

Many authors have commented that the apparent hierarchy does not simply involve relative degrees of directness, but reflects the interaction of several factors. For example, deHaan (1999) suggests that the categories have something to do with two sets of oppositions: direct vs. indirect (which he terms "deictic") and firsthand vs. secondhand (which he terms "witness"). See also Faller (2001) and Willett (1988). Moreover, the fact that the same basic categories show up in language after language suggests that Evidentials do not just encode pragmatically or culturally salient types of evidence. For one thing, this limitation on the categories of evidence doesn't hold of adverbs, predicates or parentheticals that express evidential concepts, and so it clearly doesn't follow from some limitation on conceivable sources of evidence. As the examples in (7) illustrate, apparently we have many ways of talking about

² One finds authors who define "evidentials" to include both markers of evidence source and markers of degree of certainty. However Aikhenvald (2004) shows that there are languages in which evidence source is obligatorily marked with a morpheme, and these morphemes do not directly encode degree of certainty.

how we have come to believe something to be true.

7. *I deduce that it's bad weather, My lumbago tells me it's bad weather, I guess it's bad weather; Apparently it's bad weather, It seems to be bad weather, I see it's bad weather, It could be bad weather, I think it's bad weather, My mother always told me it would be bad weather, I conclude that it's bad weather, The radio said it would be bad weather....*

Furthermore, as Speas (2004a) has pointed out, the limitation on evidential categories doesn't follow from pragmatic salience. One can imagine any of the sources of knowledge in (9) might be pragmatically salient in some culture, yet no language includes a marker for any of these categories in its evidential paradigm.

8. *Knowledge gained from: dreams, hard knocks, Mom, divine revelation, vision quest, communing with nature, oracle, trial and error, random guess, mulling everything over...*

Could the limitation be simply a conceptual limit on how many items we can relate to each other within one domain? It seems not. For one thing, this would only explain why the number of categories is limited, and would not explain why we never find languages with a small set of Evidentials drawn from the categories in (8). Clearly grammaticized Evidentials form some sort of abstract system. But perhaps any abstract cognitive system can only involve a small number of interacting factors. This does not seem true as a general claim: Consider our knowledge of prototype relations within a given class. I can conceive of a fairly complex web of relations among various members of the class of dogs, where there is some sort of "nearness" relation of each member to a prototype, with no particular restriction on the size of the web.

9.

<u>near</u>	<u>farther</u>	<u>farther</u>	<u>farther</u>	<u>farthest</u>
	terrier	bulldog		dachshund
(DOG)	golden retriever	cocker spaniel	poodle	
	german shepherd	collie	St. Bernard	chihuahua
	beagle	Labrador		

Thus, it seems that the limitation on Evidential paradigms is a fact about certain kinds of cognition, not a fact about general cognition. Whether this constraint is purely linguistic remains to be seen, and I will discuss this issue briefly in Section 4. At any rate, the constraint is not predicted by any existing theory of the status of Evidentials in the grammar.

2. Evidential Categories

Let us take a look at the basic categories found in Evidential systems. Willett and others (Bybee, Perkins and Pagliuca 1994, Givón 1982, a.o.) show that the most basic Evidential opposition is that between Direct and Indirect evidence, i.e. whether the source of information is of a primary or secondary nature. Many languages mark only this distinction, and no Evidential system lacks this distinction. I will begin by looking in more detail at the two Evidential categories that involve "Direct" evidence.

Languages that distinguish between two types of “Direct” evidence generally distinguish between evidence acquired through unique personal experience and evidence acquired through witnessing an event. For example, in Eastern Pomo the Sensory (another term for Personal Experience) evidential is used for internal sensations, while the Direct is used for witnessed events.

10. Eastern Pomo:

- a. bi·Yá p^ha bé-k^h-ink’e

hand burn-PUNCTUAL-SENSORY

‘I burned my hand’ (I feel the sensation of burning in my hand)

- b. mí-p-al p^ha bé-k-a

3.sg.-male-PATIENT burn-PUNCTUAL-DIRECT

‘He got burned’ (I have direct evidence, eg., I saw it happen)

In a certain sense, both internal sensations and witnessing are direct experiences. However, knowledge gained through personal/internal experience in the Evidential sense is characterized by the quality that Searle (2004) calls “ontological subjectivity”: the knowledge exists only from a first person point of view. For example, my knowledge that I broke my arm is quite different from the knowledge of someone who witnessed me breaking my arm. Our personal experience is simply part of our general epistemic state. In a sense it is knowledge that requires no external justification. This differs from knowledge gained by witnessing, since anyone who witnessed an event can have roughly the same knowledge. In many languages, the Personal Experience category of Evidentials is described as being restricted to sentences with first person subjects, since a speaker can’t know someone else’s internal experience. Note that the claim that ontologically subjective knowledge of a proposition is known only from a first person point of view does not mean that the proposition is known only by a particular person. Two people can know the same proposition, yet their knowledge may differ in ontological subjectivity.

I will use the term “Direct” evidence for evidence acquired through witnessing the relevant event. In the literature the term “Visual” is sometimes used for this category, but this is misleading for two reasons. First, in cases where one can be considered to have witnessed an event without visually perceiving it, the Visual evidential can be used. For example, Garrett (p.c.) reports that blind speakers of Tibetan have little trouble understanding and using the “Direct” evidential. Second, visual evidence can trigger an inference in cases that do not involve witnessing. If I know that Mary is home because I see her lights on and her car in the driveway, I am making an inference from indirect evidence, although the evidence does happen to be visual. As Garrett(2001) shows for Tibetan, events reported using Direct Evidentials are characterized by “observability.” This means that the *state of affairs being reported* was observed by the Speaker, not just that the knowledge has something to do with visual input. Knowledge obtained through witnessing has the property that Searle (2004) calls “causal self-referentiality.” Searle explains that beliefs (and desires) differ from perceptual experiences (and memories, and intentions) in that perceptual experiences cause the knowledge that results from them. “If we spell out the conditions of satisfaction of the memory (or perceptual experience - ps.) they are not just that the event occurred, but also that its occurrence cause the very memory that has the occurrence of the event as the rest of its conditions of satisfaction.” (2004:170) We cannot

13. [1] T'ah tlé'dá' danásikai **ni'** áidí' Western Apache (de Reuse 2003)
 'We left from there while it was still dark.'
 [2] Hikahgo nohwee gozt'íid
 'It got daylight while we were walking'
 [3] Go dził bikáyú hikahgo t'ąązhí' nijēēdyú nádadilt'íid
 'And when we were walking on the mountain we looked back down to where
 we had slept.'
 [4] Ái n'í nanezna' ɬeshijēēdyú nohwiheskāā **lék'eh!**
 'We had slept in a graveyard!' de Reuse (2003:84-85)

In short, Hearsay Evidentials mark the “least local” kind of knowledge of a given situation.

To summarize, we can describe the four Evidential categories in the following way:

14. Personal Experience: Source of evidence is ontologically subjective.
 Direct: Source of evidence is a witnessing experience, which includes the reported event.
 Indirect: Source of evidence is some state of affairs from which the reported event can be inferred.
 Hearsay: Source of evidence is related to some context other than the present one.

3. Evidence, Evidentials and Situations

Jakobsen (1957) characterized Evidentials as “the verbal category which takes into account three events - a narrated event (E^n), a speech event (E^s), and a narrated speech event (E^{ns})” (quoted in Aikhenvald (2004:13-14). My proposal builds on this observation that evidence type has to do with the relationship between the event being reported and the event through which the speaker came to know what is being reported. I propose that Evidential morphemes encode relations between the situation of which a proposition is true and a “Reference Situation” and also a relation between this Reference situation and the Discourse situation.

In Situation Semantics, (Barwise 1981, Barwise and Perry 1983, Barwise and Etchemendy 1987, Kratzer forthcoming) situations are parts of worlds, and a given proposition is true of a particular situation, sometimes called a Reference Situation, Focus Situation or Topic Situation³. As a number of researchers have pointed out (Izvorski 1998, Papafragou 2000, Speas 2004a, Chung 2006, Matthewson et al. 2006) evidentials seem to express characteristics of the *modal base* (Kratzer 1977, 1991), which is the set of assumptions upon which a modal judgment is based. In recent work, Kratzer (2007) has characterized these assumptions as a situation or set of situations accessible from the situation of which the proposition is true. Kratzer illustrates this point with the following example.

³ It is noteworthy that this situation is called “Topic” situation by some and “Focus” situation by others. I will discuss the potential parallels between Topic Situations and Topic or Event Times in Section 4.

15. “Suppose the two of us observe a bear crossing the road one night in Glacier National Park. Since it is dark, we can’t see the bear very well, and I say to you:

(17) The bear might be a grizzly.” (2007:11)

In this example, the proposition is true of a situation (s) if and only if there is an accessible situation(s’) in which the unique bear is a grizzly. Given that it’s too dark in s to know whether the bear actually is a grizzly, we rely on what we can detect along with what we know about bears, etc. So s’ is essentially the evidence we have for the proposition. The precise identity of the accessible situation is determined by properties of the utterance context (plus the lexical meaning of the modal). For example, s’ might be a situation in which there’s a grizzly bear that smells just like the one we currently see, and the utterance context is one in which the Speaker knows a bit about bear odors, but is not an expert, so she believes it’s possible that the bear is a grizzly.

The modal quantifies over the accessible situations. Evidentials differ from modals in that they express something about the situations that lead the Speaker to believe what she is asserting, but they do not specify a type of quantification. Rather, they simply tell us a bit more about the relevant accessible situations.

In most proposals that treat Evidentials as providing information about the modal base, the nature of the information(indirect evidence, direct evidence, hearsay, etc.) is simply stipulated. For example, Matthewson et al. (2006) propose the following denotations for St’at’imcets evidentials:

16. Semantics of *k’a* (inferential)

$[[k’a(f)(B)(w)(\phi)]]$ is only defined if for all worlds $w', w' \in B(w)$ iff **the inferential evidence** in w holds in w' , and f is a choice function of type $\langle st, st \rangle$ such that $f(B(w)) \subseteq B(w)$.
If defined, $[[k’a(f)(B)(w)(\phi)]] = 1$ iff for $\forall w' \in f(B(w))$: $[[\phi(w')]] = 1$.

Semantics of *-an'* (perceived-evidence)

$[[-an (f)(B)(w)(\phi)]]$ is only defined if for all worlds $w', w' \in B(w)$ iff **the perceived evidence** in w holds in w' , and f is a choice function of type $\langle st, st \rangle$ such that $f(B(w)) \subseteq B(w)$.
If defined, $[[-an (f)(B)(w)(\phi)]]$ = 1 iff for $\forall w' \in f(B(w))$: $[[\phi(w')]] = 1$.

Semantics of *ku7* (reportative)

$[[ku7(f)(B)(w)(\phi)]]$ is only defined if for all worlds $w', w' \in B(w)$ iff **the reported evidence** in w holds in w' , and f is a choice function of type $\langle st, st \rangle$ such that $f(B(w)) \subseteq B(w)$.
If defined, $[[-ku7 (f)(B)(w)(\phi)]]$ = 1 iff for $\forall w' \in f(B(w))$: $[[\phi(w')]] = 1$.

(Matthewson et al. 2006)

In these denotations, the Evidential provides a restriction on the modal base. This treatment of Evidentials captures the fact that Evidentials form a coherent semantic class (at least in some languages) that is closely related to epistemic modality. There are three different evidentials, providing three different restrictions. If nothing more is said, we might expect to find languages with many more Evidentials, with denotations like those discussed earlier, stipulating vision-quest evidence, hard knocks evidence, evidence from a foreigner, etc.

I believe that the reason we do not find such languages is that Evidentials are Functional morphemes that encode inclusion and accessibility relations among situations. The lexical content of a particular Evidential morpheme does not specify a particular kind of evidence; rather, it specifies a relation between the situation of which the proposition is true and two other situations: a Reference situation and a Discourse situation. Under this view, “evidence” is not a grammatical primitive. The restrictions on evidence type come from the relational nature of Evidentials. Since the only possible relations introduced by the Evidential are inclusion or precedence, the possible values of Evidentials are limited to instantiations of these relations.

My proposal is inspired by the work of Jakobsen and also Nikolaeva(1999),⁴ who argues that Evidentials in Ostyak encode equivalence or non-equivalence relations between the situation about which the assertion is being made and one of two other situations (roughly, the evidence situation and a situation resulting from the Event.)⁵ Since Ostyak evidentials are morphologically fused with Tense and differ from Pomo-type evidentials in several ways, I will adopt Nikolaeva’s basic idea that evidentials encode relations among situations, but will work it out in a somewhat different way.

I propose that Evidentials are functional heads that introduce relations among the following three situations:

- | | | |
|-----|--------------------------|------------------------------------------------------|
| 17. | Evaluated Situation (ES) | The situation of which p is true |
| | Reference Situation (RS) | A situation relevant to ES and DS |
| | Discourse Situation (DS) | The situation in which the sentence is being uttered |

Notice that I am not introducing any new primitives here. The “Reference Situation” is already familiar from Kratzer’s treatment of modals (although she does not use that terminology). The Reference Situation is the set of assumptions upon which the judgment of truth is based. The Discourse Situation is the situation of the utterance of the sentence. We know that there are such situations, because sentences are often true of them. For example, “Mary said that Bill arrived late” is true of a situation in which there was a Speaker (Mary) and a thing she said (something about Bill arriving late). The Discourse Situation is just that kind of situation as it is happening.

Let us begin by looking at Indirect Evidentials. Indirect evidence is the kind upon which English-type modal judgments are generally based. When we make an inference based on indirect evidence, the inference is based on some accessible situation, as captured in the

⁴ Chung (2005, 2006) develops a similar analysis of Evidentials in Korean, which are morphologically distinct from Tense morphemes, but homophonous with Aspect and Mood morphemes. Building on Izvorski (1998)’s analysis of languages in which morphemes marking Perfect Aspect are also used to mark inferential Evidentiality, Chung argues that Korean has “spatial deictic tenses⁴”, and when these combine with certain aspect or mood morphemes, the result is an Evidential meaning. Spatial deictic tense indicates that the Speaker’s location (more specifically, the “Speaker’s Perceptual Trace” in the sense of Faller (2004)) is restricted to a certain place at the reference time. Direct Evidential meanings result when the Speaker’s location at the event time is the same as the event location at that time. In other words, if we are at an event when it takes place, we have “direct” evidence. Indirect Evidential meanings result when the event occurs outside of the Speaker’s location at the time of the event.

situation-theoretic treatment of modals. Inference is based on a Reference Situation whether the sentence expressing it includes a modal or not. For example, in the dark campground scenario, instead of using a modal I might say “Run - The bear is a grizzly!” even if I am only inferring the type of bear from an accessible situation in which the bear with similar properties is a grizzly. Under the circumstances, I might not want to wait around for a direct experience confirming my hypothesis. The unmodalized sentence conveys a high degree of certainty but does not entail an absence of inference. Consider a game of “Clue.” The whole point of the game is to make an inference based on cards and the results of game play. When I declare “It was Miss Scarlet, in the Billiard Room, with the rope”, the situation on which I am basing my statement is implicit, but clearly crucial. Conversely, there are also contexts where a modalized sentence is felicitous even when inference is not involved. For example, normally if we saw John hit a pedestrian, we wouldn’t say “John must have hit the pedestrian,” but if we’re arguing with someone who insists that Mary must have hit the pedestrian, we can felicitously say “No, John must have hit the pedestrian, I saw it.” The point is that the relationship between Reference Situations and Situations of which propositions are true is independent of modals per se. In English, we often use necessity or possibility modals when conveying information inferred from indirect evidence. Modals express our degree of certainty, and the fact that we are inferring from an accessible situation is implicit.

In languages that have Evidentials, the fact that we are inferring from an accessible situation cannot be implicit. The Evidential encodes the relation between two situations, and the degree of certainty is implicit (or expressed with a separate modal).

18. Indirect Evidential: RS is accessible from ES

So far we have just reiterated the observation of Izvorski (1998) and others that indirect evidentials encode the presence of a modal base - the Reference Situation. Things get more interesting when we look at the other categories of evidence.

Direct Evidentials indicate that the Speaker witnessed the relevant situation. de Haan (1999) explains that “when a speaker uses a visual (direct) evidential...he or she is saying that the action was witnessed personally *because it occurred in the same deictic sphere as the location of the speaker.*” (Cited in Garrett 2001:56) In other words, the situation upon which the judgment is based **contains** the situation being reported. For example, if I’m telling you about looking out of my tent during the day and I say “There was a bear right in front of the tent,” I am basing my claim on what I saw. The situation of which the proposition is true is just one in which there is a bear and it is in front of the tent. The Reference Situation is a slightly bigger one, (although nothing rules out proper inclusion) which includes me and the fact that it’s light enough for me to see the bear. The Reference Situation is often implicit in English, but in a language with Evidentials, this sentence would have to include a Direct Evidential.

19. Indirect Evidential:	RS is accessible from ES
Direct Evidential:	RS includes ES

The distinction between Direct and Indirect Evidentials is the most basic one, and some languages encode only this distinction. Some languages, however, further distinguish between

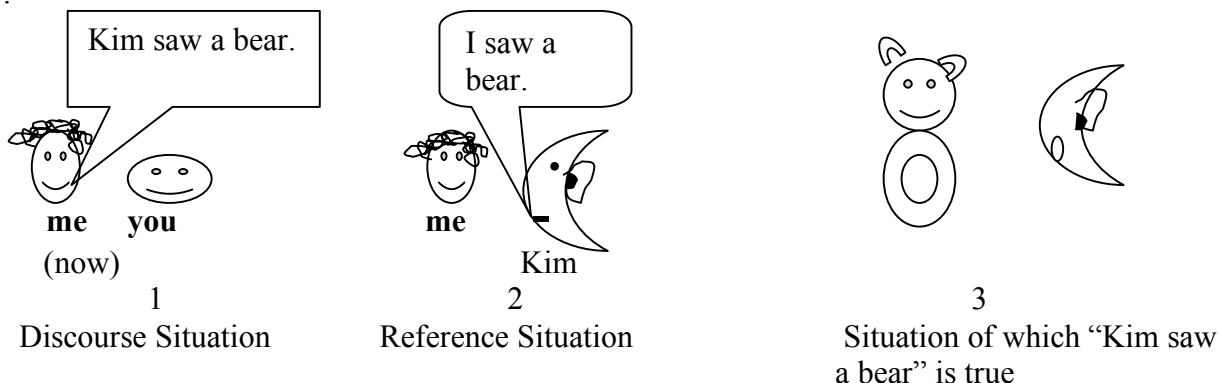
indirect evidence and hearsay, and/or between Direct Evidence and Personal Experience. Let us look first at the distinction between Indirect Evidence and Hearsay. I will claim that these distinctions have to do with how the Reference Situation is related to the Discourse Situation.

Looking first at Hearsay, suppose I have a friend, Mary, who is an expert on bears, and at some point she has told me that grizzlies are quite docile. During our camping trip, I tell you “That bear might be quite docile.” I am basing my assertion on my conversation with Mary. This would seem to be a reasonable Reference Situation, accessible from S. However, my conversation with Mary had no actual bears in it, so the unmodalized proposition “That bear is quite docile” is not true of my conversation with Mary. The unmodalized proposition is true of some situation that is **accessible** from my conversation with Mary. In languages that do not distinguish hearsay from other kinds of indirect evidence, we can just say that there is some possible Reference situation in which our bear is docile, and there’s no need to specify how exactly the Speaker knows that this situation is accessible from s.

Languages that distinguish Hearsay from other Indirect evidence do specify how the Speaker knows that her statement is true. A Speaker who makes a claim based on Hearsay has no involvement in the situation being claimed, or in any situation from which S might be inferred. The Reference Situation is some other Discourse, from which S is potentially accessible. Discourses are situations; A sentence like “Kim said she saw a bear” is true of just such a situation. The Discourse Situation for any sentence is a situation in which there is minimally a Speaker and the Speaker’s utterance of the sentence. Situations accessible to the Discourse Situation would be other Discourses that resemble it, for example by including the same sentence. Thus, Hearsay evidence is evidence obtained in a Reference Situation accessible from the current Discourse Situation. Since accessible situations differ minimally, a Situation accessible from a Discourse Situation would generally be some other discourse, which includes most of the same elements. The claimed proposition is true of some Situation accessible from the Reference Situation.

Here’s a picture:

20.



Situation 3 is accessible from Situation 2, and Situation 2 is accessible from the Discourse Situation (Situation 1).

21. Hearsay: RS is accessible from ES
RS is accessible from DS

So, both Indirect Evidentials and Hearsay Evidentials encode an accessibility relation between the Reference Situation and the Evaluation Situation. The difference between the two is that Hearsay evidentials also encode an accessibility relation between the Reference Situation and the Discourse Situation.

Indirect Evidentials encode an **inclusion** relation between the Reference Situation and the Discourse Situation. When I make an inference, I'm taking into account the indirect data that I have, but I am also assuming the current state of affairs, my own accumulated wisdom and powers of reason, and sometimes, as von Stechow and Gilles (2005) point out, the distributed knowledge of the discourse participants. For example, suppose that when I saw a brown, furry animal on my camping trip, I thought it was a huge bunny. Now you are telling me what bears look like, and perhaps you even show me a picture. I say "That animal must have been a bear!" My reasoning is based on the properties I observed on the camping trip PLUS what I now know. Notice that it is not enough to say that the inference is based on the (accumulated) Common Ground, because I may not have described the animal to you at all yet. Moreover, it is crucial that inferences are never inconsistent with the current state of affairs. Suppose I have been gathering clues for a month and am certain that Pat is the culprit. I walk in to tell you this, but you hand me incontrovertible proof that Sam is the culprit. I cannot say "I infer that Pat is the culprit but I guess I'm wrong" or "Pat must have been the culprit, but I see now that he wasn't." I must relegate my inference to the past, and take the present discourse situation into account. Thus, the Reference Situation for Indirect Evidentials includes the Discourse Situation.

22. Indirect Evidential: RS is accessible from ES
RS includes DS

Turning now to Direct Evidentials, I have argued that these encode an inclusion relation between the Reference Situation and the Evaluated Situation. Interestingly, Direct evidence does not involve any inference. If I witness something, I know it to be true in virtue of having witnessed it. My experience cannot be changed by something that is happening now, short of discovering that my witnessing was not an actual witnessing. If I realize that my "witnessing" was actually a hallucination, then I realize that I in fact do not have Direct evidence. As long as my witnessing Kim's leaving does actually unambiguously exist, nothing about the Discourse Situation is relevant to my knowledge that Kim left. The witnessing effectively caused my knowledge. Thus, Direct Evidentials do not encode an inclusion relation between the Reference Situation and the Discourse Situation. Rather, when I say "Kim left-DIRECT", I am saying that there is a situation accessible from the Discourse Situation that included Kim's leaving. The fact that the Reference Situation involved a witnessing by the Speaker does not have to be specified. This will follow from pragmatic principles: The situations most closely accessible to the Speaker are those she knows about firsthand.

23. Direct Evidential: RS includes ES
RS is accessible from DS

As discussed above, in languages that distinguish Direct Evidentials from Personal Experience Evidentials, the difference is that Personal Experience involves things that only the Speaker can know. As Nikolaeva (1999) pointed out, with assertions about personal experience the situations relevant for interpretation are all equivalent. In our terms, the Reference Situation is the same as the situation of which the proposition is true. The proposition expressed by (10a), for example, is true of a situation in which the Speaker experienced the burning of his hand. Moreover, since the relevant personal experience is unique to the Speaker of the sentence, the Reference Situation includes the Discourse Situation. Unlike with Direct evidence, new information about the nature of one's internal state can affect the evaluation of an internal experience. For example, ten years ago I might report my internal state as "I am in love with X," but now I might report exactly that same internal feeling as "I was immaturely obsessed with X." As another example, I might report that breaking my toe was "agonizing", but then after having experienced childbirth report the same toe-injury experience as "some discomfort." Thus, Personal Experience Evidentials encode an inclusion relation between the Reference Situation and the Discourse Situation.

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|----------------------------|----------------------------------|
| 24. Personal experience | RS includes ES
RS includes DS |
|----------------------------|----------------------------------|

In sum, I am suggesting that the labels for evidence types in Evidential systems are just shorthand for a relation between the Evaluation Situation and a Reference Situation, and the Reference Situation and the Discourse Situation.

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|------------------------------|------------------------------------------------------|
| 25. "Personal experience" | RS includes ES
RS includes DS |
| "Direct" | RS includes ES
RS is accessible from DS |
| "Indirect" | RS is accessible from ES
RS includes DS |
| "Hearsay" | RS is accessible from ES
RS is accessible from DS |

The parallels to a Reichenbachian analysis of Tense/Aspect systems are obvious. Following Klein (1994), Demirdache and Uribe-Etxebarria (2000) and Terry (2002), among others, treat Tense as a relation between Reference Time and Discourse Time and Aspect as a relation between Reference Time and Event Time. The relevant relations for Tense/Aspect systems are inclusion and precedence, while the relevant relations for Evidentials are inclusion and accessibility. It is beyond the scope of this paper to show convincingly that accessibility and precedence are, at an abstract level, the same. But we can note that we talk about inferences as cases of one situation "following from" another. Moreover, when an Evidential morpheme is homophonous with a Tense or Aspect marker, the two values correspond in the relations they encode. For example, in many languages Indirect Evidentials are homophonous with Perfect

Aspect markers. Terry(2002)⁶ characterizes the Present Perfect as expressing the following relations.

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|-----|----------|--------------------------------------------------|
| 26. | Perfect: | Reference Time follows Situation(aka Event) Time |
| | Present: | Reference Time includes Discourse Time. |

If we grant the speculative parallel between precedence and accessibility, we can see that the Indirect Evidential encodes exactly the same set of relations, only the relata are situations rather than times.

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|-----|----------|--------------------------|
| 27. | Indirect | RS is accessible from ES |
| | | RS includes DS |

The parallels seem to extend to other cases of Evidential/Temporal homophony. Woodbury(1986) shows that a Sherpa morpheme traditionally analyzed as a “habitual experiential” imperfective Aspect is best explained as indicating that the Speaker has personal experience evidence for the information being conveyed. In other words, there is a correlation between the Aspect that encodes an inclusion relation between Reference Time and Event Time and the Evidential that encodes an inclusion relation between Reference Situation and Evaluated Situation. Another example involves perception predicates in English. English perception predicates convey direct perception when their complement is tenseless and hence simultaneous with the perception predicate. Temporal simultaneity thus corresponds to the inclusion relation between the Reference Situation and the Evaluated Situation.

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|-----|----------------------------------------------------------------|
| 28. | Mary saw Susan leave. |
| | Time of Mary’s seeing includes time of Susan’s leaving. |
| | Situation of Mary’s seeing includes situation of Susan leaving |

Of course, Tense and Aspect markers may have temporal values that are independent of Evidentiality, and as Aikhenvald (2004) shows, languages differ in the extent to which there is overlap in the morphemes used to express Tense, Aspect or Evidentiality. However, the analysis outlined above predicts that when Tense or Aspect morphemes are “extended” to express Evidential meanings, the extension will not be random. A temporal morpheme that expresses a given precedence or inclusion relation between times will be extended to express the same relation, but with situations rather than times as the relata.

In summary, if the analysis of Evidentials that I have outlined is on the right track, then the limitations on possible values of grammaticized Evidentials follows from the fact that Evidentials are functional heads that express only accessibility and inclusion relations. Unlike adverbs, attitude or perception predicates and parenthetical phrases, Evidentials lack lexical content beyond the abstract encoding of these relations between the Evaluated, Reference and Discourse Situations.

IV. Generalized Functional Heads

⁶ Terry calls the Reference time “Topic Time.”

The analysis of Evidentials that I have proposed differs from previous analyses in three ways: First, it gives Evidentials a homogeneous analysis as a distinct category. Second, it treats Evidentials as a kind of inflectional category like Tense. Third, it defines “evidence” rather than treating it as a primitive. I will discuss each of these in this section.

4.1 Evidentials as a homogeneous category

It would be possible to incorporate my characterization of evidence types into a theory in which Evidentials are a type of modal. For example, one might adopt the Matthewson et al. denotations and substitute for the phrases about Speaker’s evidence a suitably formal statement of the accessibility and inclusion relations. However, there are several reasons to keep the denotations of Evidentials separate from those of modals.

First, the various ways in which Evidentials are systematically different from Epistemic modals are documented in Chung and Timberlake(1986), de Haan (1999), Lazard (1999), Aikhenvald (2006), Davis, Potts and Speas (2007) and Speas (2007), among others. The central conclusion of these works and others on specific languages is that Evidentials do not express quantification over worlds (or situations). Evidentials may co-occur with modals, and when they do not, the degree to which the Speaker believes the assertion to be true follows from pragmatic principles. Davis, Potts and Speas (2007) and Fasola(2007) show how the effect of epistemic modality results from the way that Evidence type interacts with Gricean maxims of quality.⁷

Another reason to favor an analysis in which Evidentials are distinct from epistemic modals is that Evidentials are obligatory in some languages, but to my knowledge there are no languages with obligatory epistemic necessity and possibility modals. Thus, Evidentials are inflectional in a way that epistemic modals are not. One possibility is that Evidentials express inflectional features of Epistemic modals, much in the way that Agreement expresses features on a Tense Head in some analyses. Speas (2004a) draws on parallels between Evidentials and Person features to suggest that Evidentials express a kind of agreement with the modal base. That proposal treated the modal base as a set of possible worlds, but could be considered to be a precursor to the analysis presented in this paper. At any rate, even if Agreement features are features found on Tense heads, Tense and Agreement are clearly distinct. I claim that Evidentials are similarly distinct from epistemic modals.

4.2 Evidentials as in inflectional category

If the analysis that I have proposed here is on the right tract, then Evidentials share certain properties of inflectional paradigms in general. Schlenker (2004) and Speas (2004a) have argued that tense, mood and person features also show what I will term “paradigmatic symmetry”. (See also Sigurdsson 2004 on person-tense symmetry). Schlenker points out that in all three domains (and in the domain of spatial deixis), referential classification involves whether the entity is local or non-local and whether this locality is evaluated relative to the current speech act or a logophoric reference point.

⁷ Davis, Potts and Speas do not adopt any particular theory of evidence type.

29. Paradigmatic symmetry of pronouns, tenses and moods (and locations)⁸

	local	< local	<< local	other ref.pt.
P:	I	you	he/she	obviative
T:	plays	played	had played	sequence of tns
M:	plays	would play	would have played	irrealis

Schlenker develops a semantic analysis in which truth values are relativized to *sequences* of individuals, times and worlds, and values in all three of these domains are constructed from a generalized locality relation and particularized accessibility relations. All three of these types of inflectional features encode nearness to the deictic center. The apparent hierarchy in degree of locality follows from the interaction of locality with the reference point (current speech act or other reference point). Person denotes these relations as they hold among individuals, Tense denotes these relations as they hold among times and Mood denotes these relations as they hold among worlds. I would claim that Evidentials denote the same relations, as they hold among situations.

Some authors have claimed that the relations encoded by Tense and Aspect are configurational relations. Stowell (1996) and Demirdache and Uribe-Etxebarria (2000) argued that Tense and Aspect encode configurational relations in that they encode inclusion and precedence relations. In a Minimalist framework, the only possible structure-building operation (Merge) adds a new item to the structure and either includes it in an existing category or projects a new category. The idea here would be that all Functional heads encode the same relations found in phrase structure: inclusion, and sequentiality/precedence. Under this view, “paradigmatic” Functional categories like Tense, Aspect and Evidentials) are not fundamentally different from “syntagmatic” (aka “Lexical”) categories like Verbs and Nouns. The difference is that Nouns, Verbs, Adjectives and Prepositions have lexical content in addition to the structure that they project, while Functional Categories encode only the abstract syntactic relations of precedence and inclusion (along with the category of their relata).

It is admittedly a gigantic leap from the proposal that Evidentials encode relations between situations to the claim that these relations are configurational in some sense. Also, it is not clear at all that the “configurational” relations I am proposing are represented as part of the syntactic structure of a sentence containing an Evidential. The important point is that Functional features are constrained by a uniform system of inclusion and accessibility/sequence/precedence relations. Interestingly, these constraints also resemble those that Hale and Keyser (1999) have identified as constraining possible argument structures. Hale and Keyser point out that argument structures are subject to a limit on size: there are transitive, intransitive and ditransitive predicates, but no language has predicates with four obligatory arguments. They propose that the primitives of the computational system are *head*, *complement*, *specifier* and *project*. Lexical conceptual structures are not recursive, so a given LCS can have a head, a complement and a specifier, and the head can project the Larsonian shell structure, allowing one additional external argument. (See Juarros 2003 for a demonstration of how recursion can be ruled out in a Hale/Keyser type theory.)

⁸ The chart in (2) is my own summary of the general idea outlined by Schlenker.

The only difference between the restrictions noted by Hale and Keyser and those discussed above is that the “reference point” for phrase structure is the projection. Phrase markers depict inclusion and precedence relations with respect to either the head or its projection. Apparently Grammar will tolerate relational structures no larger than those involving a basic item, a Reference item and an item related to the Reference item. Thus, we have structures consisting of Verb+internal argument+external argument or Reference Time, Discourse Time and Event Time or Reference Situation, Discourse Situation and Evaluated Situation, etc. There seems to be some basic cognitive constraint ruling out relational systems more complex than this. Whatever this constraint is, it does not apply to Prototype structures (and possibly many other kinds of cognitive structures) and it is somehow circumvented by syntactic recursion.

4.3 Dispensing with “evidence” as a primitive

The approach I have outlined makes no reference to the ontologically problematic category “evidence,” nor is pragmatic information such as “Speaker’s perceptual/epistemic state” included. “Evidence” is nothing more or less than a situation that bears a precedence or inclusion relation to the Evaluated and Discourse Situations. The fact that these situations have something to do with the Speaker’s epistemic state follows from Gricean Principles. Since we assume that a Speaker believes what s/he is asserting, the situations that led to that belief must be part of the Speaker’s experience and epistemic state. We find exactly the same assumptions governing the pragmatics of explicit statements about evidence. For example, suppose I say the two sentences in (30).

30. Iraq has weapons of mass destruction. There is evidence.

Basic principles of discourse coherence lead you to assume that I am familiar with the evidence, the evidence is relevant to my claim about weapons, and I believe the claim, so the evidence is what led me to the claim. There is no lexical item or portion of the semantic representation that specifies this. Similarly, Evidential morphemes do not specify that the Speaker has some particular kind of knowledge of the relevant situations. This kind of information follows from basic pragmatic principles. Similarly, pragmatic principles dictate that an assertion be complete and maximally informative, so it will always be assumed that a Speaker used the most informative and appropriate Evidential. This has the effect of limiting relevant situations. For example, I have claimed that Direct Evidentials indicate that the Reference Situation includes the Evaluated Situation and is accessible from the Discourse Situation. Does this predict that a Direct Evidential could be used if the Speaker did not witness the Evaluated situation, but only knows it to be included in some other situation? It does not predict this unless the Evaluated Situation is an inalienable part of the Reference Situation. Otherwise, the Speaker must have inferred the presence of the included situation from the presence of the including one.

For example, suppose I was at the circus, but I did not wait around to see the Clowns. There is a situation (the circus) that clown tricks are part of, so could I use a Direct Evidential as in (31)?

31. There were clown tricks-Direct Evidential

First of all, the minimal relevant situation in this case would be the portion of the circus performance that I attended, not the entire circus. But even if the situation were the entire circus, I could not use the Direct Evidential, because my knowing that Clown tricks are part of a circus and therefore must have been part of this one involves an inference, and so the Inferential Evidential would have been more accurate.

5. Conclusion

I have claimed that Evidentials are Functional heads that encode inclusion and accessibility relations between the Evaluated Situation and a Reference Situation, and between the Reference Situation and the Discourse Situation. This analysis distinguishes Evidentials from epistemic modals, dispenses with “evidence” as a primitive category and explains the restricted inventory of Evidential types in terms of constraints that also seem to hold of other inflectional categories and also of argument structures.

I would like to end by briefly discussing the possible origin of the constraint on inflectional categories and argument structures. Hale and Keyser characterized it as a syntactic constraint. It is probably more accurate to say that this limitation is on the “computational component”, which may or may not be specific to language. As Hauser, Chomsky and Fitch (2002) point out, it may be that the principles of hierarchical sequencing that govern language are not unique to language, but they certainly are distinct from a variety of other cognitive abilities such as drawing generalizations, finding featural similarities, recognizing faces, etc. It is well known that when asked to state the number of items that they see, people can do so quickly up to three items, and for more than this their speed and accuracy deteriorates quickly. Research on general implicit learning of patterns has also found limits on the depth of a pattern that can be learned. For example, Cleermans and McClelland (1991) found that people can learn implicit patterns of items separated by up to two random interveners. So a person could learn an implicit pattern like 1 r r 4 r r 3 r r 2 r r, where r is a random number, but cannot implicitly learn a pattern like 1 r r r 2 r r r 3 r r r 4 r r r. Zacks et al. (2001) asked subjects to divide common events into larger and smaller sub-activities, and found that the median number of smaller units per larger unit was 3.5, and the range of ratios was 1-5. I don’t know the psychological literature well enough to know whether people can learn a five-part sequential pattern, but much of this literature aims to show that since people can learn general stochastic patterns, there is no reason to posit a distinct faculty for language. My own position is that we don’t know enough yet about either language or other pattern learning to know how exactly how language is related to other sorts of pattern recognition, so research on the nature and limits of natural language patterns is crucial. Obviously language patterns must be a subset of the types of patterns that humans are able to learn. What remains largely unknown is the extent of crosslinguistic variation in language patterns and the nature of the limits on implicit learning.

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