Evidentials in attitudes: do's and don'ts

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Abstract. This paper is devoted to evidentials in attitudinal complements. I start with two empirical observations. A. Some logically possible interpretations are systematically not attested for evidentials-in-attitudes. This new observation has no straightforward account in the current literature. B. Languages vary with respect to whether or not evidentials-in-attitudes *shift*, i.e. whether they are speaker-oriented (as in root declaratives) or not. The variation has been previously attributed to the semantic non-uniformity of evidentials. I argue against this view. To account for A, I propose that evidentials are self-ascriptions, which is additionally motivated by their behavior in matrix clauses. To account for B, I propose that evidential shift is an instance of indexical shift driven by a monster operator à la Anand and Nevins (2004), which explains previously unnoticed similarities in restrictions on both kinds of shift. Understanding what happens in attitude reports has often been key to the semantics of many phenomena, e.g. pronouns and modals. Offering the first systematic examination of evidentials-in-attitudes across languages, the paper makes a case for evidentials and broadens our understanding of perspective-sensitivity in general.

Keywords: attitude reports, cross-linguistic variation, evidentiality, perspective shift

1. Introduction

Consider a root declarative wherein an evidential adverbial reflects the speaker's judgment:

(1) Tar sands are **evidently** an unmitigated disaster for the environment.[1]

Attitudinal complements are environments wherein evidentials do not have to be speaker-oriented:

I thank Maria Aloni, Pranav Anand, Lisa Bylinina, Ivano Caponigro, Cleo Condoravdi, Eva Csipak, Amy Rose Deal, Donka Farkas, Jesse Harris, Vincent Homer, Vadim Kimmelman, Dan Lassiter, Sven Lauer, Roumyana Pancheva, Barbara Partee, Hazel Pearson, Johan Rooryck, Philippe Schlenker, Yael Sharvit, Benjamin Spector, Dominique Sportiche, Ed Stabler, Tim Stowell, Anna Szabolcsi, Igor Yanovich, Henk Zeevat, and audiences at Institut Jean Nicod, Sinn und Bedeutung 19, UCLA, ZAS and ACLC/ILLC. I thank my language consultants for sharing their language with me. I am especially grateful for their help to Nana Dekanosidze, Georgian; Deniz Özyildiz, Turkish; Roumyana Pancheva, Ivan Derzhansky and Vesela Simeonova, Bulgarian; Yasutada Sudo, Yu Tanaka and Jun Yashima, Japanese; and Yun Kim, Yangsook Park and Suyeon Yun, Korean. All errors are mine. Glosses used: ADV adverbial; AOR aorist; COMP complementizer; DAT dative; DECL declarative; DIR direct; ERG ergative; EV.PST evidential past; F feminine; FUT future; GEN genitive; LOC locative; NOM nominative; O object; PL plural; POSS possessive; PRES present; PST past; REP reportative; SG singular; S subject; TOP topic.

[1]From http://www.theguardian.com/commentisfree/2010/may/11/alberta-california-tar-sands-oil.

(2)   What shallow, worthless, selfish lives and yet these are the same false gods that Republicans worship since the Right believes that wealth is **allegedly** a divine gift.[2]

(3)   *Context*: For a number of years now *the Australian* newspaper has engaged in guerrilla war-fare with the progressive parties in general. But, with the Australian Greens, ordinary sneaky guerrilla tactics are way too subtle.

      The Australian believes that the Greens, **apparently**, deserve a nuclear takeout.[3]

The most salient reading of (2) is such that *allegedly* embedded under *believe* reflects the speaker's evidential judgment, but not that of the attitude subject, the Right. Conversely, the most salient reading of (3) is such that *apparently* embedded under *believe* reflects the opinion of the attitude subject, *the Australian*, but not that of the speaker. Following Garrett (2001), I will refer to cases of switch in orientation from the speaker to the attitude subject (as in 3) as *shift*. The range of interpretations of embedded evidentials as well as the mechanism of evidential shift are poorly understood. This paper presents a cross-linguistic investigation that aims to fill in this gap. Section 2 lays out the core data. Section 3 reviews previous approaches. Section 4 provides a formal treatment of evidentials as belief reports with a shiftable indexical. Section 5 concludes.

2. Empirical landscape

The literature on evidentiality has mostly been focusing on root clauses, most notably declaratives, while evidentials-in-attitudes are often only discussed passim (with some exceptions: Garrett 2001; Sauerland and Schenner 2007; Schenner 2010; Şener 2011). Below I discuss which interpretations are available across and within languages.

2.1. Universals

I discuss the following logically possible parameters of variation for evidentials-in-attitudes (cf. similar discussion in Schenner 2010): (i) **perspective**: whether the evidential operator Ev is ori-ented towards the speaker or attitude subject, and (ii) **scopal interaction with the attitude verb, or projection**: whether Ev is in the scope of the attitude predicate or not. These notions are fre-quently conflated in the literature, e.g. being speaker-oriented is often regarded as an equivalent of projection while being subject-oriented is often regarded as semantic embedding (Koev 2011; Matthewson et al. 2008; Matthewson 2012). There are indeed correlations between perspective and (what looks as) projection. Still the parameters themselves are *conceptually* distinct.[4]

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[2]From http://www.huffingtonpost.com/2012/06/19/charles-hopper-lehman-brothers-suicide_n_1608791.html.

[3]From http://www.nudiefish.com/2012/06/im-not-biased-i-just-hate-you.html.

[4]The reader should bear in mind that whether or not the evidential operator is in the scope of the attitude verb is different from the scope of the evidential operator: evidentials always take scope only in the complement clause.

Let's assume the following toy semantics (to be revisited) for the evidential operator such that it is relativized to an individual, *evidential origo* (term due to Garrett 2001), and a world (cf. Sauerland and Schenner (2007)'s semantics for Bulgarian reportative):

(4) $[\![\mathbf{Ev}]\!] = \lambda w.\lambda x.\lambda p.\text{EV}(w, x, p) = 1$ iff x in w acquired p in a particular way that is lexically specified by the evidential marker (direct perception, inference, hearsay, etc)

Let x^* be the speaker, w^* the world of evaluation, x_{ATT} the attitude subject, and W_{ATT} the set of worlds introduced by the attitude predicate, e.g. doxastic alternatives by *think*, $\text{DOX}_{x_{\text{ATT}},w^*}$. In root cases, $x = x^*$ and $w = w^*$. In embedded cases, there can be at least four interpretations:

(5) Logically possible interpretations (as discussed below, grey cells are not attested)

	$w = w^*$	$w \in W_{\text{ATT}}$
$x = x^*$	not shifted, projected; (6a)	not shifted, not projected; (6b)
$x = x_{\text{ATT}}$	shifted, projected; (6c)	shifted, not projected; (6d)

Consider contexts that clearly distinguish between these interpretations of the sentence below:

(6) Pollux: 'Castor thinks [that **reportedly** [solar panels are efficient]]'.
     $x^* = $ Pollux, $x_{\text{ATT}} = Castor$, $W_{\text{ATT}} = \text{DOX}_{Castor,w^*}$, $p = $'Solar panels are efficient'
     $[\![(6)]\!] = 1$ iff $\forall w' \in \text{DOX}_{x_{\text{ATT}},w^*}$: **reportedly** p in w'

  a. *Context*: I, Pollux, heard from many people that they are, Castor knows it for sure.
      (6) ≈ Castor thinks that — and I heard it — solar panels are efficient.
      $[\![(6)]\!] = 1$ iff $\forall w' \in \text{DOX}_{Castor,w^*} : p$ in $w' \wedge x^*$ heard p in w^*
      $= 1$ iff solar panels are efficient in $w' \wedge$ I (Pollux) heard in w^* that solar panels are efficient

  b. *Context*: But I was not told so. I only infer it based on how many neighbors install them.
      (6) ≈ Castor thinks that I heard that solar panels are efficient.
      $[\![(6)]\!] = 1$ iff $\forall w' \in \text{DOX}_{Castor,w^*} : p$ in $w' \wedge x^*$ heard p in w'
      $= 1$ iff solar panels are efficient in $w' \wedge$ I (Pollux) heard in w' that solar panels are efficient

  c. *Context*: I know that Castor was told it many times by neighbors. He has forgotten about it and thinks that panels should be efficient because he generally believes in green energy.
      (6) ≈ Castor thinks that solar panels are efficient (and he heard it).
      $[\![(6)]\!] = 1$ iff $\forall w' \in \text{DOX}_{Castor,w^*} : p$ in $w' \wedge x_{\text{ATT}}$ heard p in w^*
      $= 1$ iff solar panels are efficient in $w' \wedge$ Castor heard in w^* that solar panels are efficient

  d. *Context*: Castor, based on what he thinks his neighbors said, believes in solar panels' efficiency. He's, in fact, confused about it — his neighbors aren't really into clean energy.
      (6) ≈ Castor thinks that, as he heard, solar panels are efficient.
      $[\![(6)]\!] = 1$ iff $\forall w' \in \text{DOX}_{Castor,w^*} : p$ in $w' \wedge x_{\text{ATT}}$ heard p in w'
      $= 1$ iff solar panels are efficient in $w' \wedge$ Castor heard in w' that solar panels are efficient

All of the interpretations above are *a priori* conceivable but not all of them are attested: grey cells in the chart in (5) contain interpretations that are not available, (6b) and (6c). Consider (7):[5]

(7)   Georgian (Kartvelian); evidential past ambiguous between visual inferential and hearsay
      Context 1, cf. (6a): I've never met Natasha, who is a friend of a friend. Said friend told me that Natasha knows Georgian.
      Context 2, cf. (6b): I've never met Natasha, who is a friend of Maria's, and generally know very little of her. Maria is sure she told me that Natasha knows Georgian.

      *maria   pikrobs   [rom   natasha-s   **codnia**   kartul-i]*
      Maria.NOM   think.3SG.S.PRES   COMP   Natasha-DAT   3SG.S.**EV.PST**   Georgian-NOM

      (i)   *Context 1*: 'Maria thinks that—*and I was told it*—Natasha knows Georgian'.

      (ii)   #*Context 2*: 'Maria thinks that *I was told that* Natasha knows Georgian'.

As the example above shows, Georgian evidential past cannot be used in a scenario wherein someone other than the speaker ascribes to the speaker having a certain kind of evidence about p: the evidential cannot be speaker-oriented and be evaluated with respect to the attitude subject's doxastic alternatives (the same also holds for Bulgarian and Turkish). The opposite situation is not attested either: the evidential cannot be subject-oriented and be evaluated in the actual world. Illustrated with a Korean example below; the same holds for Bulgarian, Japanese and Turkish.

(8)   Korean; direct perception marker *te* (adapted from Lee (2013): ex. 22)
      Context 1, cf. (6c): Chelswu went outside during the rain yesterday. He somehow has forgotten it and thinks he only knows about the rain from his neighbors.
      Context 2, cf. (6d): Chelswu, who spent all day sick, thinks he went outside and saw the rain.

      *Chelswu-nun [pi-ka   ecey   o-**te**-la-ko]   malha-yess-e.*
      Chelswu-TOP   rain-NOM   yesterday   fall-**DIR**-DECL-COMP   say-PST-DECL

      (i)   #*Context 1*: 'Chelswu said that—*and he has perceived it*—it was raining yesterday.'

      (ii)   *Context 2*: 'Chelswu said that, *as he has perceived*, it was raining yesterday.'

Some interpretations are systematically absent. It might seem that in the attested interpretations the two variables x and w co-vary: either both of them are interpreted with respect to the matrix clause (6a; 7i) or both of them are interpreted with respect to the embedded clause (6d; 8ii). Mismatch interpretations as in (6b; 7ii) and (6c; 8i) are not allowed even though nothing in (4) prohibits it. Sauerland and Schenner (2007) stipulate this fact for the Bulgarian reportative. I argue that this seeming co-variation is due to the subjectivity of evidentials: the evidential origo is the one and only authority over their information source, see section 4 for the full entry. In both of the unattested cases, someone attributes having evidence to another individual: speaker to attitude subject (6c; 8i) or attitude subject to speaker (6b; 7ii). In both cases, said individual does not think

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[5]Unless indicated otherwise, data come from my work with consultants.

they have this kind of evidence, which is exactly the reason evidentials are ruled out.[6]

2.2. Variation

Languages vary in which interpretation they allow. Above I've shown that perspective has an impact on the worlds the evidential is evaluated with respect to. In what follows, I will use *shift* as a shortcut for the interpretation where the individual argument shifts and the evidential is then interpreted with respect to that individual's relevant alternatives set.

2.2.1. No shift

In some languages, evidentials-in-attitudes are obligatorily speaker-oriented. This is the case in Bulgarian (South Slavic) as reported in (Sauerland and Schenner 2007; Koev 2011), and Georgian:

(9)   Georgian
      Context 1: Maria and Nana are supervising monks' work on translation. I've heard about it from Nana. Later, Maria also tells me about it.
      Context 2: The priest is supervising monks' work and tells Maria about it. She then tells me but I actually know it directly as I was helping the monks.

      maria-ma   mitxra   rom   ber-eb-s   biblia   kartul-ad
      Maria-ERG   tell.me.AOR   COMP   monk-PL-DAT   Bible.NOM   Georgian-ADV
      gadautargmniat
      translate.3PL.S.3SG.O.**EV.PST**

      (i)   *non-shifted, context 1*: 'Maria told me that—*and I was told that already*—the monks translated the Bible into Georgian.'

      (ii)   # *shifted, context 2*: 'Maria told me that, *as she was told*, the monks translated the Bible into Georgian.'

Context 1 forces the non-shifted interpretation: the speaker has hearsay information about the scope proposition, while Maria knows it directly.[7] The sentence can be used in this scenario.

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[6]This is a property specific to evidentials rather than something universal to the expressions of evidence (contra McCready 2011). Expressions such as *be told*, seemingly expressing similar semantics as e.g. hearsay evidentials, are perfectly acceptable in mismatch scenarios: *Castor thinks that **I was told that** solar panels are efficient. However, nobody told me such a thing* (cf. 6b) or *Castor thinks—**and he was told it**—that solar panels are efficient. He himself, however, does not remember being told so and bases his judgment on how popular they are among his neighbors* (cf. 6c). The consequence for the theory is that semantics of evidentiality should be modelled in a way that predicts these restrictions.

[7]Note that Maria cannot be the source of information so it is a genuine speaker-oriented reading rather than an evidential concord reading wherein evidential just repeats the content of the attitude verb (Schenner 2010).

Context 2 forces the shifted reading: the speaker knows for sure about translation, while the attitude subject, Maria, has hearsay information about it. The sentence cannot be used in this context, which indicates that evidential past has to be interpreted with respect to the speaker.

2.2.2. Optional shift

In some other languages, embedded evidentials can be interpreted either with respect to the speaker or the attitude subject. This is the case in German (Schenner 2010, confirmed with consultants); Bulgarian (Roumyana Pancheva, p.c.); and Turkish (Şener 2011):

(10)   Turkish: direct evidential *di* (Şener (2011): ex.98a,99a; confirmed with consultants)
       Context 1: Berna told Seda that Ayşe has red hair and Seda believes her. Seda says: 'Ayşe has red hair'. I (speaker) saw Ayşe's red hair with my own eyes.
       Context 2: Seda saw Ayşe's hair, and tells me: 'Ayşe has red hair'. I didn't see Ayşe myself.
       *Seda [Ayşe'nin saç-ı   kızıl-**dı**] de-di.*
       Seda Ayşe-GEN hair-POSS red-**DIR** say-PST-DIR

   (i)   *non-shifted, context 1*: 'Seda said that–*and I've seen it*–Ayşe has red hair'.

   (ii)   *shifted, context 2*: 'Seda said that, *as she has seen*, Ayşe has red hair'.

Context 1 forces the non-shifted reading: the speaker has seen Ayşe's red hair and therefore has direct evidence for what Seda said, while Seda, attitude subject, has only hearsay evidence. Context 2, on the other hand, forces the shifted interpretation: the speaker has only heard about Ayşe's red hair, while Seda has seen it. The sentence can be used in both, indicating that direct evidential *di* optionally shifts. Another evidential, *miş*, behaves likewise.

2.2.3. Obligatory shift

Finally, there are languages where evidentials in attitude reports shift obligatorily. This is the case in Japanese; Korean (Lee 2013); Standard Tibetan (Tibeto-Burman; Garrett 2001); St'át'imcets (Salish; Matthewson et al. 2008); Zazaki (Iranian; Gajewski 2005).

(11)   Korean: immediate perception marker *te* (based on Lee 2013: ex.7c)
       *Yenghi-nun [Chelswu-ka khaley-lul mek-**te**-la-ko]   malha-yess-ta*
       Yenghi-TOP Chelswu-NOM curry-ACC eat-**DIR**-DECL-COMP say-PST-DECL

   a.   non-shifted: #'Yenghi said that–*and I have perceived it*–Chelswu ate the curry'. Infelicity of the follow-up 1 confirms absence of this reading: #But Yenghi did not see or otherwise observe Chelswu eating the curry. She heard about it from his neighbor.

    b.   shifted: 'Yenghi said that, *as she has perceived*, Chelswu ate the curry'. Felicity of the follow-up 2 confirms presence of this reading: But I did not see or otherwise observe it.

In this example, different follow-ups probe whether the evidential shifts or not. If it can be speaker-oriented, then the attitude subject, Yenghi, does not have to have perceptual evidence for Chelswu's curry-consumption. However, explicitly indicating that Yenghi did not see or otherwise perceive it results in infelicity, as shown in (11a). If *te* can shift, then it is the speaker who does not have to endorse the evidential claim. As shown in (11b), this continuation is felicitous.

2.3. Interim summary

In this section, I showed that out of logically possible interpretations only some are available to evidentials across languages. Perspective of the evidential has an impact on which worlds it is evaluated with respect to: (i) speaker-oriented evidentials have to be evaluated in the actual world, which creates an effect of projection, and (ii) subject-oriented evidentials are evaluated with respect to subject's alternative set, which creates an effect of them being in the scope of attitude verb. On top of these constraints, there are also language-specific restrictions. Languages fall into three classes with respect to which perspective evidentials may take:

(12)   A. **No evidential shift:** Georgian, Bulgarian*

       B. **Optional evidential shift:** German, Turkish, Bulgarian*

       C. **Obligatory evidential shift:** Korean, Japanese, St'át'imcets, Tibetan, Zazaki
          * for some speakers

In the next section I discuss how these restrictions are handled by the current theories.

3. Previous approaches

I made two empirical observations: (A) some interpretations are systematically absent, and (B) there is cross-linguistic variation in perspectival orientation of evidentials. A is neither discussed nor fully predicted. B is often used as one of the diagnostics used to justify the existence of two semantic classes of evidentials: (i) **modal**: those that operate at the propositional level (Garrett 2001; McCready and Ogata 2007; Matthewson et al. 2008; Lee 2013), and (ii) **illocutionary**: those that contribute content that is not part of the main assertion (Faller 2002; Murray 2010; Koev 2011). Modal evidentials are expected to scopally interact with attitude verbs and shift, while illocutionary evidentials are expected to be non-embeddable semantically and remain speaker-oriented.

One problem with this view is that there is no independent empirical support for the modal vs. illocutionary distinction above: other tests used in the literature do not in fact distinguish between the

two classes (Matthewson 2012), e.g. evidentials across the board do not scopally interact with negation. And if evidential shift is the *only* diagnostic, the modal-illocutionary divide might not be the right way to cut the evidential pie (section 4). Another problem is that for languages with optional evidential shift, we have to postulate systematic lexical ambiguity, e.g. under this view Turkish has a modal *miş*, obligatorily shifted, and an illocutionary *miş*, obligatorily speaker-oriented. I discuss further issues below.

Modal approaches. Sentences with evidentials carry an *Evidential Requirement (ER)*: they are only felicitous if the proposition expressed by the sentence was acquired in a particular way, e.g. direct perception or hearsay. Most modal approaches model ER as a presupposition (Izvorski 1997; Matthewson et al. 2008; Matthewson 2012; Lee 2013; cf. also von Fintel and Gillies 2010 on *must*). Verbs like 'think' and 'say' "plug" presuppositions. Sentence *Mary thinks that the president of the world is Canadian* does not entail that there is a unique world's president and does not commit the speaker to this view. The expectation is that ER will also be "plugged" in such environments, which under the modal view means that evidentials will be subject-oriented. However, there are languages where evidentials are always speaker-oriented, even under 'say' and 'think', and evidentials in some of these languages (Bulgarian) have received a modal analysis.

At the same time, modal approaches take for granted that modals-in-attitudes always shift, which is motivated by the following examples:

(13)   Scylla thought [that Odysseus' ship **might** pass Charybdis].

    a.   non-shifted, speaker-oriented: # ... but Scylla was sure it would pass.

    b.   shifted, subject-oriented: ... but I was sure it would pass.

To account for (13), modals are analyzed as relativized to an individual: agent of a particular event (Hacquard 2010) or judge (Stephenson 2007). Under both approaches, the variable in the modal has to be bound locally, which predicts (13b) and bans (13a). Subject-orientedness of evidentials-in-attitudes is presumably modelled in the same way as that of modals (it is not explicitly discussed in the literature).[8] However, the landscape of modality is not exhausted by modal auxiliaries in Germanic and Romance. Consider the behavior of *possible* in attributive position:

(14)   *Context*: Meaghan and I are lost in the backcountry. We managed to get stranded on a ledge from which we can proceed no further.

    Meaghan said that a cliff was overhanging a **possible** escape route.

    a.   non-shifted, speaker-oriented: ... but she thinks that this route that I pointed to will eventually turn into a dead-end.

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[8]These approaches partially capture subjectivity in the sense that among subject-oriented interpretations, only such as in (6d) but not as in (6c) will be allowed. However, they also rule out speaker-oriented interpretations altogether since evidentials will be forced to shift in embedded clauses.

b.   shifted, subject-oriented: . . . but I think that the route she pointed to will eventually turn into a dead-end.

English modal adjectives do not have to shift. The moral? We know little about the behavior of modals-in-attitudes. The difference between (13) and (14) is likely due to syntax. But automatically assuming that speaker-oriented and subject-oriented evidentials have a different syntax will be preliminary at best. Therefore, we cannot outsource evidential shift to Hacquard's or Stephenson's mechanism. More research is needed.

Illocutionary approaches. Koev (2011) argues that Bulgarian evidentials-in-attitudes are obligatorily speaker-oriented (in his dialect) by virtue of being not-at-issue. However, appositive relative clauses—classically analyzed as contributing not-at-issue content—need not be speaker-oriented (Harris and Potts 2009; Schlenker 2013):

(15)   *Context*: My aunt is extremely skeptical of doctors in general.

She says that dentists, **who are only in it for the money anyway**, are not to be trusted at all. (Harris and Potts 2009: Appendix A, ex.3a)

Provided the alleged parallelism between evidentials and other types of not-at-issue content (see also Murray 2010), we expect evidentials to undergo optional shift but, as I've shown, the expectation is not fulfilled.

To sum up, current theories fall short at explaining universals and variation in evidential shift and make wrong predictions. In the next section, I develop an alternative account that does not make reference to the modal vs. illocutionary distinction.

4. Proposal

To recapitulate, there are two main sets of facts that I aim to account for. First, some of the logically possible interpretations are not attested for evidentials-in-attitudes: namely, ones where having information source is ascribed to the evidential origo by a third party. Second, there is cross-linguistic variation in who can be the evidential origo in attitudes: in some languages, it has to the speaker, while in some others, it can or must be the attitude subject.

Before I proceed, two background assumptions need to be made (Anand 2006; Anand and Nevins 2004). (i) Attitude predicates quantify over indices (rather than (centered) worlds).[9] (ii) An index is an object of type k, same as context, and includes information about the circumstance of a speech act such as e.g. speaker and world. This will become important when I discuss evidential shift in 4.2.2.[10] In matrix cases, index and context are the same.

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[9]In a similar system in (Schlenker 2003; Sudo 2012) attitude predicates directly manipulate contexts.

[10]Anand and Nevins (2004) provide conceptual arguments from attitudes 'de se' as to why index includes more

(16) $i_k = c^* = \langle author, hearer, \ldots, world \rangle$

This gives the following semantics for an attitude predicate such as 'think' and a sentence with it:

(17)   a. $[\![\text{think}]\!]^{c,i,g} = \lambda\phi_{\langle k,t\rangle}.\lambda x_e.\forall i'$ compatible with what x thinks at i, $[\![\phi]\!]^{c,i',g}$

   b. $[\![$ Meaghan thinks that I am a space alien $]\!]^{c,i,g}$
        $= \forall i'$ compatible with what Meaghan thinks at i, $[\![$ I am a space alien $]\!]^{c,i',g}$
        $= 1$ iff AUTHOR(c*) is a space alien at $i' = 1$ iff the speaker is a space alien at i'

Intensional operators such as 'think' manipulate the index parameter. The context parameter, on the other hand, remains intact in the scope of attitude predicates and expressions such as *I*, which are sensitive to context, do not change their reference, as in (17b). The context parameter can only be manipulated by *monsters*, to be discussed later in section 4.2.

4.1. Universals: subjectivity

I argue that evidentials, together with e.g. epistemic modals and taste predicates, belong to the class of *subjective* expressions whose truth is relativized to some individual and therefore cannot be evaluated externally. The formal implementation is as follows. I analyze evidentials as self-ascriptions of the property of acquiring the scope proposition in a particular way lexically specified by the evidential. I also add one more individual coordinate to the context: *origo*, responsible for whose information source is reflected by the evidential. We need both *author* and *origo* because they are sensitive to different operators, see 4.2.2 below.

Just like other perspective-sensitive phenomena, evidentials obey the speaker default:

(18)   ORIGO(i) = AUTHOR(i)

Consider the lexical entry for the reportative use of the non-shifting Georgian evidential past below:

(19) $[\![\text{EV.PST}_{\text{REP}}]\!]^{c,i,g} = \lambda p.p \;\wedge\; \forall \langle x', w'\rangle \in \text{DOX}_{Origo_c, w_c} : \text{HEAR}(x', w')(p)$

(19) says that the evidential asserts (a) its scope proposition[11] and (b) that in all world-individual pairs compatible with what the evidential origo $Origo_c$ believes in the world of evaluation w_c,

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than just time and world: obligatorily 'de se' expressions such as PRO can be analyzed as making reference to the individual coordinates, which immediately accounts for lack of 'de re' interpretations.

[11]It has been argued (see e.g. Faller 2002; Murray 2010) that evidentials differ in whether they assert their scope proposition (direct evidentials) or its modalized version (indirect evidentials), or merely present it (reportatives). For my current purposes, strength of evidential statements is irrelevant so I ignore this issue.

individual x' that the origo identifies as themselves in w' heard p. This is a departure from a more standard treatment of evidential requirement as not-at-issue (see section 3).

This analysis does double duty. First, (19) takes care of the first grey cell in (5) and the non-attested reading in (6b). It straightforwardly accounts for the fact that evidentials-in-attitudes cannot be used in scenarios when having information source for p is ascribed to the origo by a third party: evidentials are only felicitous just in case the origo believes of themselves that they have a particular information source for p (to put it differently, origo is a *de se* individual). Here is a derivation for (7), whose translation is repeated below:

(20)   a.   Maria thinks that [EV.PST$_{REP}$ [Natasha knows Georgian]]
              = self-ascribed: 'Maria thinks that—*and I was told it*—Natasha knows Georgian'.
              $\neq$ non-self-ascribed: #'Maria thinks that *I was told that* Natasha knows Georgian'.

       b. $\forall i'$ compatible with what Maria thinks at i, $[\![$EV.PST$_{REP}$ [N. knows G.]] $]\!]^{c,i',g}$
              = 1 iff N. knows G. at i' $\wedge$ $\forall \langle x', w' \rangle \in \text{DOX}_{Origo_c, w_c} : \text{HEAR}(x', w')$ (N. knows G.)
              = 1 iff N. knows G. at i' $\wedge$ I believe at i that I heard that N. knows G.

Second, the semantics in (19) has another empirical advantage: it immediately accounts for the fact that ER cannot be challenged or denied in the subsequent discourse. For instance, sentences with hearsay evidentials cannot be replied to with 'No, you were not told so'. This property of *non-challengeability* has been attributed to the not-at-issue status of ER (e.g Murray 2010). However, (not-)at-issueness does not have to correlate with (non-)challengeability: first-person belief reports (e.g. *I am sure there is life on Venus*) are not challengeable yet clearly at-issue. At the same time, subjective expressions are non-challengeable by definition. Under my analysis, it falls out naturally since origo is the one and only authority over their epistemic state. *Premises* for having a belief can be challenged, just like premises for an evidential statement (Faller 2007; Matthewson 2012), but not the very fact of holding some belief. For instance, if my addressee believes my information source is not trustworthy, they can challenge said source and thus cast doubt on the validity of my claim, but that does not challenge holding some belief unless I decide to revise it later.

Previous approaches do not connect lack of some interpretations in embedded clauses and non-challengeability in matrix cases. The approach I advocate derives both properties from the same source, subjectivity, and also does not postulate any additional dimension of meaning that is not obviously motivated empirically (cf. discussion in Schlenker 2013).[12]

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[12]Further empirical support for subjectivity of evidentials comes from the fact that evidentials across the board are judged true in Gettier scenarios. Unfortunately, there is no space here for a more thorough discussion.

4.2. Variation: shifted indexicality

The analysis above is incomplete without an account of the cross-linguistic variation in evidential shift. To this end, I propose that *origo* is a shiftable indexical. The emerging typology of languages vis-a-vis evidential shift (12) closely resembles the typology of languages vis-a-vis shift of indexical pronouns such as *I*:

(21) A. **No pronominal shift:** English; French; Russian; . . .

   B. **Optional pronominal shift:** Aghem, Amharic (Schlenker 2003, secondhand data); Catalan Sign language (Quer 2005); Japanese (Sudo 2012); Korean (Park 2014); Kurmanji (Koev 2013); Mishar Tatar (Podobryaev 2014), Navajo (Speas 1999); Nez Perce (Deal 2014); Slave (Rice 1986); Tamil (Sundaresan 2012); Turkish (Özyildiz 2013); Zazaki (Anand and Nevins 2004)

   C. **Obligatory pronominal shift:** Balkar (Koval 2014); Matses (Munro et al. 2012); Uyghur (Shklovsky and Sudo 2014)

Configurations with the shifted *I* somewhat resemble the English *Meaghan thought: "$I_{M.,*speaker}$ should fight the patriarchy"*, except that in English it is only possible in quotation. In languages in (21B, 21C), indexical shift also occurs in bona fide embedded clauses, as evidenced by e.g. availability of cross-clausal dependencies (see (Munro et al. 2012) for an overview of diagnostics).

Just like pronominal shift, evidential shift is confined to attitudinal complements and is not sensitive to the perspectival center introduced by experiencer PPs or across sentence boundary:[13]

(22) Turkish

   babam-la   konuş-tu-m
   father-with speak-PST-1SG
   'I spoke to my father'.

   a. *saat iki-de   gel-eceğ-**im***   [Pronouns]
       time two-LOC come-FUT-**1SG**
       (i) non-shifted: 'I'm coming at 2'; (ii) #shifted: 'He's coming at 2'.

   b. *hastalan-**mış***   [Evidentials]
       get.sick-EV.REP.3SG
       (i) non-shifted: 'He is sick, *I was told*'; (ii), #shifted: 'He is sick, *my father was told*'.

In the example above, neither the shiftable pronoun nor the evidential can refer to *babamla* 'father' introduced in the previous sentence.

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[13]Supplements, on the other hand, can shift in such environments (Harris and Potts 2009), which is another argument that casts doubt on the analyses treating evidentials on a par with them, see section 3.

4.2.1. Pronominal indexical shift in a nutshell

Two major families of approaches to pronominal indexical shift differ, in particular, in the locus of cross-linguistic variation. For Schlenker (2003) and von Stechow (2002) (modulo differences in the formal implementation), *I* in e.g. English can only be bound globally by the matrix context while the Amharic *I* can be in addition bound locally, which results in shifting to the author of the reported context. I will call it the binding approach. An alternative analysis (Anand and Nevins 2004; Shklovsky and Sudo 2014) maintains uniform binding conditions and attributes the variation to the presence or absence of a context-shifting operator 👻, the monster, in the lexicon of a given language: English does not have it while Amharic does, which results in shifting. The monster takes the context parameter of its sister and overwrites it with the index parameter:

(23) $[\![\,👻\,\phi_{k,t}\,]\!]^{c,i,g} = [\![\phi]\!]^{i,i,g}$

Given that the index parameter is the one affected by intensional operators (see (17a)), indexical elements in ϕ such that it is in the scope of an attitude verb change their reference whenever the monster is present in the same clause. The empirical advantage of the operator approach comes from restrictions associated with indexical shift. The binding approach predicts that sentences with two indexicals are four-way ambiguous. But e.g. Zazaki clausemate indexicals either all shift or do no shift at all:

(24)   pseudo-Zazaki: I, Natasha, tell Kavita: *"Meaghan told Kathleen [$_{CP}$ **I** admire **you**]"*.

	I=AUTHOR(c*)=N.	I=AUTHOR(c')=M.
you=HEARER(c*)=Kavita	✓	☹
you=HEARER(c')=Kathleen	☹	✓

This effect, dubbed *Shift-Together*, falls out naturally under the operator approach. When the monster is present, everything in its scope has to shift: [att.verb [$_{CP}$ 👻 [**I** admire **you**]]]. For ramifications and other advantages, see Anand (2006); Sudo (2012).

4.2.2. Evidential shift

Sauerland and Schenner (2007) analyze Bulgarian reportative as a non-shiftable indexical that can only be bound by the matrix context. Extended to other languages, this analysis gives a Schlenker/von Stechow view on evidential shift (adopted by Şener (2011) for Turkish). Based on the restrictions on evidential shift and their similarities to restrictions on pronominal shift, I opt for the operator approach. I propose that evidential-shifting languages have the following operator in their lexicon, modelled after context-shifters in (Anand and Nevins 2004; Deal 2014):

(25) $[\![\, \text{👾}_{EV}\, \phi_{k,t}\,]\!]^{\langle Author_c, \boldsymbol{Origo_c}, ..., w_c\rangle, i, g} = [\![\phi]\!]^{\langle Author_c, \boldsymbol{Origo_i}, ..., w_c\rangle, i, g}$

The sole function of monsters is to overwrite context coordinate(s), this is why it was important to ensure that index and context are of the same type. The evidential monster 👾_{EV} takes the *Origo* coordinate of the context parameter ORIGO(c) and changes it to the *Origo* coordinate of the index parameter ORIGO(i), while everything else remains the same. Given that ORIGO(i)=AUTHOR(i) (speaker default in (18)), in attitudinal complements this results in the evidential shift to the attitude subject whenever the monster is present:

(26) $[\![\, \text{think}\, \text{👾}_{EV}\, \phi_{k,t}\,]\!]^{\langle Author_c, \boldsymbol{Origo_c}, ..., w_c\rangle, i, g} = \lambda x. \forall i' \in \text{DOX}_{x, w_c}: [\![\text{👾}_{EV}\, \phi]\!]^{\langle Author_c, \boldsymbol{Origo_{i'}}, ..., w_c\rangle, i', g}$

At the same time, reference of indexical elements sensitive to other context coordinates is intact (see discussion at the end of this section). Other monsters overwrite other coordinates.

In optional-shift languages such as Turkish, 👾_{EV} can be present or absent in the structure. In obligatory-shift languages such as Korean, it is always present. Assuming that evidentials only differ in the type of evidential requirement, they receive a lexical entry similar to one in (19). This gives the following derivation for (11), whose translation is repeated below:

(27) a. Korean: Yenghi said [TE [Chelswu ate the curry]] = Yenghi said that, *as she perceived*, Chelswu ate the curry.

   b. $\forall i'$ compatible with what Y. said at i, $[\![\, \text{👾}_{EV}\, [\text{TE [Ch. ate the curry]}]\,]\!]^{\langle A_c, \boldsymbol{Origo_c}, ..., w_c\rangle, i', g}$
       $= [\![\, [\text{TE [Ch. ate the curry]}]\,]\!]^{\langle A_c, \boldsymbol{Origo_{i'}}, ..., w_c\rangle, i', g}$
       $= 1$ iff Ch. ate the curry at i' $\land \forall \langle x', w'\rangle \in \text{DOX}_{Origo_{i'}, w_c}: \text{PERC}(x', w')$ (Ch. ate curry)
       $= 1$ iff Ch. ate the curry at i' $\land$ Y. believes at i having perceived that Ch. ate the curry

Note that the second grey cell in (5) (and also 6c) is taken care of. The evidential is felicitous so long it is Yenghi and no one but Yenghi who ascribes having perceived p to herself.

Applied to evidential shift, the operator approach provides similar advantages over the binding approach as when applied to pronominal shift. First, like most pronominal indexicals (except in some Sign Languages under Role Shift, e.g. Quer 2005), evidentials exhibit *Shift-Together*:

(28) Bulgarian

Context: I'm exchanging news with Maria, we're discussing our cohort. I was mostly in touch with Jane and tell Maria that she lives in Japan. She was in touch with Lisa who is in Canada. Later on, Maria's mom joins us. Maria tells her: "Jane lives in Japan and Lisa lives in Canada".

Speaker: direct information about p = 'Jane lives in Japan', hearsay about q = 'Lisa lives in Canada'; Maria: hearsay about p, direct about q

*Maria kaza na majka si che [Dzhein zhivee-**l**-a v Yaponia] i [Lisa zhivee-**l**-a*
Maria said to mother her that [Jane live-EV-F in Japan] and [Lisa live-EV-F
v Kanada]
in Canada]

(i) expected mismatch interpretation: # 'Maria told her mother that, *as she was told*, Jane lives in Japan and—*as I was told*—Lisa lives in Canada'.

(ii) only the concord interpretation (both non-shifted): The speaker is reporting a speech event (what Maria said) of the form $p \wedge q$.

Second, evidential shift is confined to a very particular set of verbs. In Korean, an obligatory-shift language, evidentials are only licensed under 'say' (Lim 2010). In Standard Tibetan, another obligatory-shift language, it occurs under 'say' and predicates that take a complementizer derived from 'say' (Garrett 2001). In Bulgarian, while both 'think' and 'say' license embedded evidentials, only the latter licenses the shifted interpretation. The same is true for pronominal shift, which is almost exclusively licensed under 'say', plus sometimes other communication predicates and 'think' (see (Sundaresan 2012) for an overview). The binding view predicts uncondional shift under all attitude predicates, given that their semantics is uniform. The operator view allows more space for variation, e.g. it is possible to formulate the restriction in terms of selection. I leave the precise formulation of the distribution of monsters for future research.

One might righteously wonder: why not just say that origo is shifted by the same operator that shifts the author coordinate? In other words, why multiply monsters? The shifting behavior of evidentials and indexicals in languages where both shift (Korean, Turkish) is not uniform. For instance, in Korean evidential shift is obligatory while pronominal shift is optional. Furthermore, there is no interaction between evidential and pronominal shift, which would be expected were both shifts due to the same monster. Despite the obligatory shift of *te*, both shifted (triggered by 👀 $_{PER}$, Park 2014) and non-shifted interpretations of the first person pronoun are allowed:

(29) Korean

*Yenghi-nun [John-i **na-lul** po-**te**-la-ko] malha-yess-ta*
Yenghi-TOP John-NOM **I-ACC** see-**DIR**-DECL-COMP say-PST-DECL

a. non-shifted: 'Yenghi said that, *as she perceived*, John saw me'.
$\forall i'$ compatible with what Y. said at i, $[\![$ 👀 $_{EV}$ [TE [J. saw me]] $]\!]^{\langle A_c, \mathbf{\textit{Origo}_c}, ..., w_c \rangle, i', g}$
$= [\![$ [TE [J. saw me]] $]\!]^{\langle A_c, \mathbf{\textit{Origo}_{i'}}, ..., w_c \rangle, i', g}$

$= 1$ iff J. saw AUTH(c) at $i' \wedge \forall \langle x', w' \rangle \in \mathrm{DOX}_{Origo_{i'}, w_c} : \mathrm{PERC}(x', w')$ (J. saw AUTH(c))
$= 1$ iff J. saw the speaker at $i' \wedge$ Y. believes at i having perceived that J. saw the speaker

b. shifted: 'Yenghi$_i$ said that, *as she perceived*, John saw her$_i$'.
$\forall i'$ compatible with what Y. said at i, $\llbracket \, \textcircled{\tiny oo}_{EV} \, \textcircled{\tiny oo}_{PER} \, [\mathrm{TE} \, [\mathrm{J. \, saw \, me}]] \, \rrbracket^{\langle \boldsymbol{A_c}, \boldsymbol{Origo_c}, ..., w_c \rangle, i', g}$
$= \llbracket \, \textcircled{\tiny oo}_{PER} \, [\mathrm{TE} \, [\mathrm{J. \, saw \, me}]] \, \rrbracket^{\langle \boldsymbol{A_c}, \boldsymbol{Origo_{i'}}, ..., w_c \rangle, i', g}$
$= \llbracket \, [\mathrm{TE} \, [\mathrm{J. \, saw \, me}]] \, \rrbracket^{\langle \boldsymbol{A_{i'}}, \boldsymbol{Origo_{i'}}, ..., w_c \rangle, i', g}$
$= 1$ iff J. saw AUTH(i') at $i' \wedge \forall \langle x', w' \rangle \in \mathrm{DOX}_{Origo_{i'}, w_c} : \mathrm{PERC}(x', w')$ (J. saw AUTH(i'))
$= 1$ iff J. saw Yenghi at $i' \wedge$ Yenghi believes at i having perceived that J. saw the Yenghi

Indexical expressions are overall not homogenous, e.g. behavior of personal and adverbial indexicals is not uniform. In Korean (Park 2014) and Nez Perce (Deal 2014), they only exhibit *Shift-Together* within one group (*I* plus *you*, *here* plus *now*) but not across groups (*I* plus *here* is four-way ambiguous, unlike in Zazaki). In Hebrew and English Free Indirect Discourse, only adverbial indexicals shift while personal ones stay faithful to the original context of utterance (Sharvit 2008). That said, it is not surprising that evidentials do not pattern together with other indexicals.

4.3. Interim summary

This section offers a formal account of evidentials-in-attitudes. I argue that the evidential requirement is a belief report. This captures the subjectivity of evidentials that manifests itself in two ways: (i) lack of interpretations in embedded clauses such that someone ascribes having information source for p to the origo, (ii) non-challengeability of evidentials, i.e. impossibility to cast doubt on, or deny, origo's having information source for p. To account for the cross-linguistic variaion in evidential shift, I argue that origo is a shiftable indexical that can only be shifted by a dedicated context-overwriting operator $\textcircled{\tiny oo}_{EV}$ present in the lexicon of some languages. When faced with restrictions on shift such as the limited set of predicates that license it or *Shift-Together*, the operator approach fares better than the binding analysis, both for evidentials and pronouns.

5. Conclusion

The goal of this paper was to tackle the interpretations of evidentials-in-attitudes. It was previously observed that in some languages, evidentials shift, while in some others, they don't. This has been attributed to the semantic variation in evidentials. I argue that shifted evidentiality is a variety of shifted indexicality, thus reducing a case of the apparent semantic variation in evidentials to variation in the lexicon. While there is little empirical support for the semantic non-uniformity of evidentials, *some* machinery to account for pronominal indexical shift is required independently, therefore this approach is better on the grounds of parsimony.

Needless to say, there are many open questions left. One such question is the status of origo. If it is not the author, maybe it is the judge? I purposefully refrained from bringing this up thus far.

Stephenson (2007) uses the judge for taste predicates and epistemics, Pearson (2013) defends a judge-free view on taste predicates, and the jury is still out for the context-dependende of epistemics. This organically leads us to the second question: what is the place of evidentials among other perspective-sensitive phenomena? Finally, what is the connection between shift in attitudes and shift in questions and where does the curious inability of pronominal indexicals to shift in questions stem from? The quest for answers takes me well beyond the confines of this paper.

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