

Epistemic Comparatives: A Cross-linguistic Investigation

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1. Introduction

Recent research on epistemic modals and evidentials has made headway in analyzing assertions with various provisos on speaker's certainty (Davis et al. 2007, von Stechow & Gillies 2010, Lassiter 2016). We contribute to this research by investigating a rarely discussed class of modal comparatives, namely epistemic comparatives, such as in (1). In (1), the speaker conveys that she believes the state of affairs where Ion is at home to be more plausible than the state of affairs where Ion is in the office.

- (1) *Romanian*
Ion este mai de-grabă acasă decât la birou.
Ion be-PRES.IND more ADV-early home than at office
'According to the speaker, it is more plausible that Ion is at home than in the office.'

These constructions have not received a lot of attention in the literature. We briefly mention here the accounts we are aware of. von Stechow & Kratzer 2014 describe epistemic comparatives in German without attempting a formal analysis. Herburger & Rubinstein 2014 use epistemic comparatives to argue that German epistemic modals are not gradable and provide a formal analysis that we adopt in this paper. Goncharov 2014 discusses epistemic comparatives in Russian. Epistemic comparatives have also not been investigated from a cross-linguistic perspective. The goal of this paper is to (partially) fill in this lacuna. We study epistemic comparatives in three language families: Germanic, Romance, and Slavic, and introduce two cross-linguistic generalizations. The first generalization is that there are two main types of languages: (i) languages that allow epistemic comparatives with simple indicative present and (ii) languages that do not. The second generalization is that the latter group requires overt modal support, expressed by the future, conditional, or (less frequently) imperfective morphology. We also claim that this split generally correlates with the presence of 'indexical present' (Schlenker 2004, Sharvit 2003, a.o.) in the language, as detected by the Sequence of Tense phenomena (SOT). We dub this correlation the SOT correlation and propose to account for it building on Giorgi's 2010 analysis of SOT as anchoring to the Speaker's Perspective combined with Wiltschko 2014.

The paper is organized as follows. In section 2, we provide some background on epistemic comparatives and in section 3, we list some of their properties. In section 4, we present our cross-linguistic observations. Section 5 discusses the SOT correlation. Section 6 introduces our analysis, while section 7 addresses some counter-examples from Germanic languages. Section 8 concludes.

2. Background

Epistemic comparatives belong to a class of the so-called propositional comparatives that compare two propositions (p and q) with respect to some attitude. The most studied member of the class are *metalinguistic comparatives* that compare p and q with respect to the appropriateness of their use

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(Bresnan 1973, McCawley 1988, Morzycki 2011, a.o.). (2) illustrates metalinguistic comparatives in English and Russian. Note that in Russian, ‘sooner’ and ‘more’, but not ‘better’, can be used in these constructions. This point will become relevant below, where we argue that the use of a comparative form of temporal adverbs is a characteristic property of epistemic comparatives.

- (2) a. Your problem is more financial than legal.
 b. Tvoja problema ✓ *skoree*/✓ *bolše*/**lučše* finansovaja čem juridiceskaja.
 your problem sooner/more/better financial than legal
 ‘It is more appropriate to call your problem financial than legal.’ *Russian*

Another example of propositional comparatives are *preference comparatives* that rank *p* and *q* with respect to desires of the subject, as illustrated in (3) (Giannakidou & Stavrou 2009, Giannakidou & Yoon 2011). Only ‘sooner’ and ‘better’ are available for these constructions in Russian, see (3-b).

- (3) a. She would rather die than marry him.
 b. Ona ✓ *skoree*/**bolše*/✓ *lučše* umret čem vyjdet za nego.
 she sooner/more/better will.die than marry for him
 ‘She would rather die than marry him.’ *Russian*

Epistemic comparatives, which are the focus of this paper, compare *p* and *q* with respect to the possibilities assigned by the speaker, see (4) (von Fintel & Kratzer 2014, Herburger & Rubinstein 2014). As mentioned above, only ‘sooner’ (but not ‘more’ or ‘better’) can be used in such constructions in Russian. We take this to be a characteristic property of epistemic comparatives and use it to single out these constructions cross-linguistically.

- (4) a. *John is sooner/more/rather at work than at home.
 b. Ivan ✓ *skoree*/**bolše*/**lučše* na rabote čem doma.
 Ivan sooner/more/better at work than home
 ‘It is more plausible_{speaker} that Ivan is at work than at home.’ *Russian*

There is no consensus in the literature whether these three types of propositional comparatives should be analyzed uniformly or not. We abstract away from this issue here and refer the interested reader to some arguments pro and con in Giannakidou & Yoon 2011 and Morzycki 2011.

3. Some properties of epistemic comparatives

For reasons of space, we are not able to discuss all properties of epistemic comparatives here. We mention three of them that are relevant to our cross-linguistic study. We refer the reader to von Fintel & Kratzer 2014 and Herburger & Rubinstein 2014 for a thorough discussion of the properties of epistemic comparatives in German. Most of them hold in other languages as well.

The first property we discuss has been already mentioned above. Epistemic comparatives use the comparative form of a temporal adverb, e.g. German *eh+er* ‘sooner’, Romanian *mai degrabă* ‘more early’, Russian *skor+ee* ‘faster’. Temporal *eh+er* is illustrated in (5) and temporal *skoree* in (6-b).

- (5) Die Schildkröte war **eh**er am Ziel als Achilles.
 the tortoise was earlier at-the goal than Achilles
 ‘The tortoise reached the goal before Achilles.’ (von Fintel and Kratzer, 2014)

The second property we need to show is that epistemic comparatives are indeed clausal and not phrasal. This is best argued for using Russian. In Russian clausal comparatives, the standard of comparison is marked by nominative case and is introduced by *čem* ‘what-INSTR’. Phrasal comparatives mark the standard with the genitive case, see (6-a). When *skoree* ‘sooner’ is used as a temporal adverb both strategies are available, see (6-b). However, when *skoree* forms an epistemic comparative only *čem* plus nominative is possible, see (6-c).

- (6) a. Ivan vyše {Mašy / čem Maša}.
Ivan-NOM (is) taller Mary-GEN / than Mary-NOM
- b. On prišel skoree {menja / čem ja}.
he came faster me-GEN / than I
- c. Ivan skoree na rabote {*Mašy / čem Maša}.
Ivan-NOM (is) sooner at work Mary-GEN / than Mary-NOM

The third property shows the epistemic nature of epistemic comparatives. Similarly to epistemic modals, epistemic comparatives are infelicitous when direct evidence is available, e.g. von Fintel & Gillies 2010. This is illustrated in (7).¹

- (7) Context: you are sitting in Ivan's office in front of Ivan
- a. #Ivan skoree na rabote čem doma. b. #Ivan skoree doma čem na rabote.
'Ivan (is) sooner at work/home than at home/work.'

4. Epistemic comparatives cross-linguistically

We have examined epistemic comparatives cross-linguistically and we make two novel observations. The first observation is summarized in (8).²

- (8) *Observation 1*
There are two types of languages:
- i) languages that allow epistemic comparatives with simple indicative present (German, Romanian, Russian, etc.) and
- ii) languages that cannot use the simple indicative present, like Italian and French.

The first type of languages is illustrated by Romanian in (1) and Russian in (4-b)/(6-c). The second type of languages is illustrated by Italian in (9):

- (9) *Italian*
*Gianni è in ufficio piuttosto che a casa.³
Gianni is in office sooner than at home
Intended: 'It is more plausible_{speaker} that Gianni is at work than at home.'

The second observation concerns languages of the second type, see (10). This is illustrated in (11).

- (10) *Observation 2*
Italian-type languages require overt modal support, expressed by the future, conditional, or (less frequently) imperfective morphology.
- (11) Gianni sarà /sarebbe in ufficio piuttosto che a casa.
Gianni be-FUT be-COND in office sooner than at home

5. The SOT correlation

Based on data from three language families (Germanic, Romance, Slavic), we observed that the split discussed in the previous section correlates with the presence of 'indexical present' (Schlenker 2004, Sharvit 2003, a.o.), which in some languages is detected by the Sequence of Tense phenomena

¹ Another property that epistemic comparatives share with epistemic modals is that they are relativized when embedded under an attitude predicate, see Herburger & Rubinstein 2014.

² We leave aside languages of the English type, where temporal adverbs, such as *sooner* (or *rather*), cannot be used in epistemic comparatives: **John is sooner/rather at home than in the office.*

³ This example is fine under a metalinguistic interpretation, that does not concern us here.

(SOT).⁴ Given this, we propose the (unidirectional) correlation in (12):

(12) *The SOT correlation*

SOT languages do not allow epistemic comparatives with simple indicative present.

Simplifying, the SOT rule is a rescue strategy in embedded configurations that allows languages with indexical present (i.e. the present obligatorily referring to the utterance time) to have the same range of interpretations as languages without indexical present (e.g. Sharvit 2003). The indexical present can be detected by sentences as in (13-a). In (13-a), the use of the present in the embedded clause requires that Maria's pregnancy hold at the utterance time. However, it also should hold at the time of Gianni's saying (2 years prior to the utterance time). Linking to both Gianni's saying and the utterance time (i.e. the obligatory double-access reading) results in infelicity. Non-SOT languages (without indexical present), like Romanian in (13-b) do not have this problem, as the double-access reading is not obligatory.

- (13) a. #Due anni fa Gianni ha detto che Maria è incinta.
 two years ago Gianni has said that Maria be-IND.PRES pregnant
 ‘#Two years ago, Gianni said that Maria is pregnant.’ *Italian*
- b. Acum zece ani, Ion a spus că Maria este însărcinată.
 ago ten years John has said that Maria be-IND.PRES pregnant
 Lit. ‘Ten years ago, John said that Maria is pregnant.’ *Romanian*

As illustrated in Table 1, most non-SOT languages have epistemic comparatives with indicative present. In SOT-languages, epistemic comparatives are not well-formed with simple indicative present. Two apparent counter-examples (Austrian German and Dutch) are addressed in section 7.

language	epist. comp. with PRES.IND	SOT
Romanian	✓	*
Italian	*	✓
French	*	✓
Spanish	*	✓
Russian	✓	*
Bulgarian	✓	*
Slovenian	✓	*
Serbian	✓	*
German	✓	*
<i>Austrian German</i>	*	*
<i>Dutch</i>	✓	?✓

Table 1: The SOT correlation data

To summarize, we observe the patterns below. In the next section we provide an analysis that accounts for the cross-linguistic distribution of epistemic comparatives and the SOT correlation.

	SOT	epist. comp. with PRES.IND	language
Type A	*	✓	Romanian...
Type B	✓	*	Italian...
Type C	*	*	Austrian German
Type D	✓	✓	Dutch

⁴ SOT is detected by the behavior of past/present under past, summarized in the table below (Abusch 1988, among many others). We use the double-access examples as a diagnostic (see the discussion in the text).

	SOT	non-SOT
pres-under-past	double-access	simultaneous/double-access
past-under-past	simultaneous/antiority	antiority

6. Analysis

We show that the empirical observations presented above can be formalized in a model where the speaker's perspective has correlates in the narrow syntax. More specifically, we use the deictic layer in the highest CP periphery where features related to the speaker's deictic center are encoded (see Speas & Tenny 2003). We combine this with Giorgi 2010 for whom this layer is also responsible for Sequence of Tense phenomena (SOT).

The gist of our proposal is that the SOT correlation results from a type of intervention effect (e.g. Beck 2006); both the interpretation of the epistemic comparative and the derivation of SOT require anchoring to the Speaker's Perspective. But as their features have divergent specifications, a clash results in languages where SOT holds. For our analysis, we need the following two ingredients:

i) *Giorgi's 2010 SOT analysis*: In SOT languages, present indicative must be strictly linked to the Speaker's Deictic Center. This requires that the present indicative features in T overlap with the speaker's *here* and *now*. Non-SOT languages do not have this requirement.

ii) *Wiltschko's 2014 anchoring formalization*: Anchoring is encoded both positively (overlap with the speaker's perspective) and negatively (lack of overlap with the speaker's perspective). Following Wiltschko's system, this can be formalized as using a coincidence [coin] feature. Categories that require linking to the *here* and *now* of the speaker must be specified as [+coin]. Combining this with Giorgi's intuition, we propose the indicative present in SOT languages must be [+coin]. Non-SOT languages, which do not require anchoring to the Speaker's Deictic Center (SpeakerC) are unspecified for [coin].

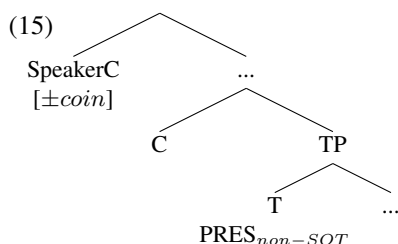
We take SOONER to have the same lexical meaning across languages. Following Herburger & Rubinstein 2014, SOONER is decomposed into two parts: an epistemic modal EPIST and a comparative morpheme -ER, see (14).

(14) [[-ER [(than) EPIST PRES John be at work]] [EPIST PRES John be at home]]

We assume that EPIST is merged high above C.⁵ As it has modal nature, it must be specified as [-coin] (not overlapping with the speaker's world and time). Thus, it is only possible in a configuration where the Speaker's Perspective projection contains [-coin] (also called [distancing] in the literature).

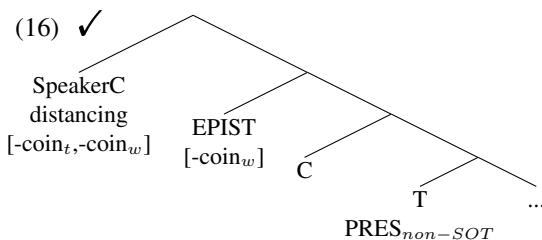
Another piece of machinery we need is that T [\pm coin] anchoring is sensitive not only to the *t* (tense) variable but also to other variables, among which the *w* (world) variable. As we show below, languages vary with respect to whether T anchoring is realized via *t* (possibly Dutch, but see below), *w* (Austrian German), both (Italian) or neither (Romanian). Putting all these pieces together, we start by discussing the simplest case of the SOT correlation, namely Type A languages like Romanian and Russian, where epistemic comparatives are possible with present indicative and there is no SOT. Following Giorgi 2010, in these languages, T does not require anchoring to the Speaker's Deictic Center, thus [coin] features are not present in T. We illustrate this in (15). In (16), we include a derivation that contains the epistemic comparative. Its modal nature implies [-coin_{*w*}] in EPIST and the [distancing] specification in the high Speaker's Perspective projection. But, as T is not specified for [coin] features, the present indicative is possible with the epistemic comparative.

Type A: Romanian (*non-SOT*)



PRES.IND specification SOT epist.

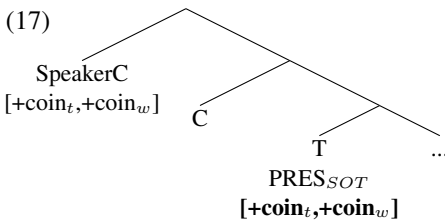
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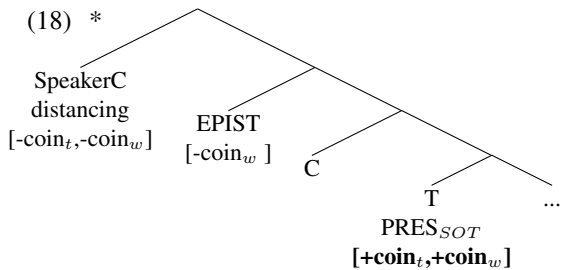
⁵ Independent support for this assumption comes from previously unexplored data regarding its interaction with evidentials, see Goncharov & Irimia 2017.

Type B, namely the Italian pattern, is more complex. As these are SOT languages, present indicative specifications in T require obligatory anchoring to the Speaker’s Perspective (based on Giorgi 2010, see ingredient i) above). Thus, for the present indicative to be spelled-out, T must be [+coin], as illustrated in (17). A problem arises when EPIST is merged. As EPIST requires [-coin_w], the Speaker’s Perspective head must be *distancing*. But, as shown in (18), this would clash with the present indicative features in T, which require [+coin_t,+coin_w] (that is, linking to the speaker’s *here* and *now* is required).

Type B: Italian (SOT)



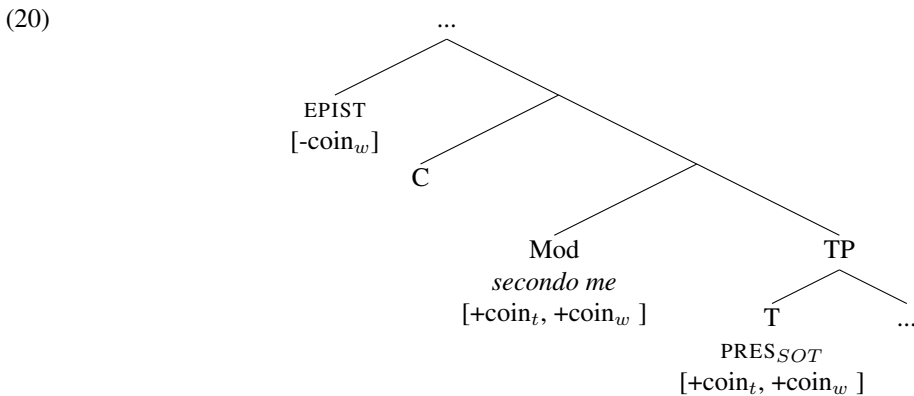
PRES.IND specification	SOT	epist.
+coin _t ,+coin _w	✓	*



Italian shows that there are (at least) two ways to solve this conflict: a) to have features in T specified as [-coin_t, -coin_w] and spell-out modal morphology, as seen in (11); b) to have the [+coin] features in T matched *locally* before EPIST is merged. Evidence for the second strategy comes from examples like (19), which contain the adverbial *secondo me* ‘according to me’. This adverbial lexically encodes the perspective of the first person evaluator. As also shown in (19), third person cannot save the derivation. This further supports Giorgi’s 2010 intuition that indexical present in SOT languages like Italian requires obligatory linking to the speaker.

- (19) Secondo me/*lui, Gianni è in ufficio piuttosto che a casa.
 according.to me/him Gianni be-IND.PRES in office sooner than at home
 ‘According to me/him, Gianni is in the office rather than at home.’

We propose that these facts can be straightforwardly accounted for by extending Giorgi 2010. *Secondo me* is a Mod element like *credo* (an adverbial from ‘believe.1.SG’). For Giorgi 2010, *credo* is initially merged in Mod (Rizzi 1997, 2004), but raises to the Speaker’s Perspective projection where it checks its deictic features. We assume that, unlike *credo*, *secondo me* contains interpretable speaker’s perspective features and thus can value [+coin_w] and [+coin_t] on T in SOT languages. This valuation operation takes place at first merge in Mod. As the [+coin] features in T are anchored to the speaker, EPIST will not act as an intervener with respect to anchoring. This is illustrated in the tree in (20):



7. A Germanic twist

As observed in Table 1, the SOT ccorrelation appears to break down in two Germanic languages, namely Dutch and Austrian German. In this section we provide some preliminary remarks about how these facts can be accommodated under the system we proposed above. It is important to highlight that the apparent violation has distinct sources in each of the two languages.

Austrian German does not seem to allow epistemic comparatives with the present indicative, while not being an SOT language either. Such constructions are possible, but, similarly to Italian-type languages, they must use overt modal morphology (subjunctive mood). This can be seen in (21). (22) shows that the double-access restriction does not obtain with present indicative, indicating that Austrian German is a non SOT language:

- (21) Da Hons *is /✓ warat eha in da oabeit ois wia daham.
 DET Hans be.IND be.SUBJ sooner in DET work as w-word at.home
 ‘According to the speaker, it is more plausible that Hans is/would be at work than at home.’
- (22) Voa zwa joa hot da Hons gsogt das d’Maria schwonga is.
 before two years has DET Hans said that DET-Maria pregnant is
 ‘Two years ago, Hans said that Mary is pregnant.’

In other words, Austrian German does not have an indexical present and yet, epistemic comparatives with indicative present are not well-formed. Building on Wiltschko 2014, we show that this pattern can be explained in our system. As opposed to Italian, where anchoring affects both the *t* (tense) and *w* (world) variables in T, in Austrian German it is only the *w* variable which is anchored to the Speaker’s Perspective. Thus, the Austrian German present indicative spells out [+coin_w]. This would be incompatible with the [-coin_w] requirement of EPIST, resulting in the ill-formedness of examples like (21) with indicative present. When the features in T are [-coin], leading to the spell-out of the subjunctive, epistemic comparatives are well formed. The derivation is illustrated in (23) and (24):

Type C: Austrian German

PRES.IND specification	SOT	epist.
+coin _w	*	*

- (23) *
- (24) ✓

The Dutch facts, on the other hand, are a bit more problematic, and require an even more refined understanding of the T(ense)A(spect)M(ood) featural organization in the language. We will be simply providing here some speculations about this counter-example to the SOT correlation. In Dutch, epistemic comparatives seem to be possible with the present indicative, as seen in (25). The problem is that Dutch appears, at least on the surface, to also be an SOT language, as demonstrated by the double-access reading in (26):

- (25) Marie is eerder in haar kantoor dan thuis
 Mary is earlier in her office than at.home
 ‘According to the speaker, it is more plausible that Mary is in the office than at home.’
- (26) Marie zei dat Jan ziek is
 Mary said that Jan ill is
 ‘Mary said that Jan is sick.’ (double-access reading only)

There could be (at least) two possible approaches to this problem. A silent *secondo me* strategy similar to Italian can potentially account for the data, but the empirical correlates are not so straightforward. Another option is to explore in more detail the underpinnings of traditional explanations for Dutch (past) tense morphology, namely its homophony with subjunctive morphology. We leave this question for future research.

8. Conclusion

A cross-linguistic investigation of epistemic comparatives has revealed two novel observations: i) some languages allow these constructions with the indicative present, while others require overt modal morphology; ii) the split seems to correlate with the presence of indexical present (as detected by SOT phenomena). More specifically, epistemic comparatives with indicative present tend to occur in non-SOT languages. We have accounted for these patterns by combining recent accounts of anchoring to the Speaker's Perspective with Giorgi's 2010 analysis of SOT phenomena. The findings reported in the paper contribute to uncovering a deeper connection between two apparently distinct phenomena, namely SOT and epistemic comparatives.

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