Exploring Syntactically encoded evidentiality

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Abstract

Behind the comprehension lag detected in the acquisition of evidentiality, be it morphologically or syntactically encoded, the most recent studies have argued to lie the interference of factors having to do with other's authority or mental perspective (Winans et al. 2015, Ünal & Papafragou 2016 i.a.), where 'other' stands for other individuals involved in various ways in the experiment (e.g. the experimenter or someone in the props). These studies have yet, however, to detect the age at which children eventually align with adults in comprehending the grammatical structure encoding the evidential interpretation. The comprehension study reported in this paper has taken the aforementioned factors into consideration and has conducted a comprehension experiment involving a large number of children, between the ages of 7 and 11, and an adult control group. The results suggest that children align with adults around the age of 9. These results do not challenge the standard view, largely supported by production data, that evidentiality is acquired early. Nonetheless, they suggest that there should be some additional factor(s) behind the comprehension lag that remain to be determined.

1.   Introduction

This paper is concerned with evidentiality in Greek, a language that encodes evidentiality in the syntax. It presents, first, a comprehension study that was designed to investigate when Greek-speaking children align with adults in terms of mapping source of evidence to a particular syntactic structure, and, second, the findings from a spontaneous speech search. Previous acquisition studies have focused predominantly on languages that encode evidentiality morphologically. These were the first to reveal that comprehension of grammaticalized source of evidence systematically lags behind production (cf. Aksu-Koç 1988; Aksu-Koç, Ögel-Balaban & Alp 2009; Papafragou et al. 2007; Ozturk & Papafragou 2016), in the sense that children have control over the morphemes that realize the evidential interpretation earlier in production than in comprehension. A few recent studies investigated how children acquire evidentiality when it is encoded syntactically, and, on the basis of naturalistic data, argue that the asymmetry reported in the previous research is replicated by one such language, namely, English. The naturalistic data in the latter studies were taken to show that children are successful in producing evidential constructions at an early age (cf. Rett & Hyams 2014), while subsequent comprehension studies failed to obtain similar results from children of the same age as those whose naturalistic data were investigated (cf. Winans et al. 2015). Ünal and Papafragou (2016) have more recently explored experimentally methodological and psycholinguistic factors that might be responsible for the comprehension lag. They conclude, on the basis of their study on Turkish, that this lag '[...] is not explained by methodological factors, but seems to be due to the psycholinguistic process of linking evidentials to others' knowledge sources.'

The current study was designed so that participants rely on their own sources of knowledge/mental perspective. Thus, having controlled for the additional difficulties that have been linked to others' mental perspective, or to experimenter's (or puppet's) authority, in the

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terms of Winan's et al. (2014), the study aims to determine how early children align with adults in comprehending the structures that encode evidentiality. This issue has not been settled in the previous acquisition studies of evidentiality.

The tasks of our study were administered to 100 typically developing Greek-speaking children aged 7;0-11;6 and 30 control adults. They show that the age at which Greek-speaking children eventually align with adults in comprehending the mapping between the evidential interpretation and a distinct syntactic structure is around age 9. This is a novel result that has important consequences for the acquisition studies of syntactically encoded evidentiality. Concretely, to the extent that our study does not suffer from methodological drawbacks, there should be additional factors besides those having to do with other's authority or other's mental perspective that may be linked to the comprehension lag observed in linguistically encoded evidentiality, and they need to be determined.

The paper proceeds as follows. Section 2 discusses the various means, morphological or syntactic, via which evidentiality is encoded in different languages, with particular focus to Greek. Section 3 presents results from previous research on the acquisition of morphologically and syntactically encoded evidentiality. Section 4 presents the details of the comprehension study we conducted, and section presents 5 the results, while section 6 presents the findings of the production data we discovered. Finally, section 7 discusses the findings and section 8 concludes.

2. Evidentiality
2.1. Evidentiality Crosslinguistically

The term *evidentiality* refers to encoding in grammar the source of information associated with an utterance. Tariana, for instance, an Arawak language spoken in Brazil that was investigated by Aikhenvald (2004), marks sentences differently, depending on whether speakers have direct or indirect access to the event they report. Tariana even offers the possibility for further, fine-grained, distinctions within the direct and indirect dimensions. Hence, in (1a) the evidence is direct and the speakers saw what they are reporting, i.e. they saw Cecilia scolding the dog, while in (1b) they heard her. (1c) and (1d), on the other hand, instantiate indirect evidence, either reported to the speaker by someone, or inferred by the speaker in some way, respectively (Aikhenvald 2003).

(1)   a.   Ceci   tʃinu-nuku   du-kwisa-**ka**
                Cecilia dog-TOP.NOM.A/S   3SGF-scold-REC.P.VIS
                'Cecilia scolded the dog.' (I saw it)
         b.   Ceci   tʃinu-nuku   du-kwisa-**mahka**
                Cecilia dog-TOP.NOM.A/S   3SGF-scold-REC.P.NONVIS
                'Cecilia scolded the dog.' (I heard it)
         c.   Ceci   tʃinu-nuku   du-kwisa-**pidaka**
                Cecilia dog-TOP.NOM.A/S   3SGF-scold-REC.P.REP
                'Cecilia scolded the dog.' (I learned it from someone else)
         d.   Ceci   tʃinunuku   du-kwisa-**sika**
                Cecilia dog-TOP.NOM.A/S   3SGF-scold-REC.P.INFR
                'Cecilia scolded the dog.' (I inferred it)

According to Aikhenvald (2004), one quarter of the world's languages have an evidential system grammaticalized by means of a morpheme. While the morpheme that marks evidentiality attaches to the verb in Tariana, it may also attach to the noun in Quechua, (2a), (Murray 2017):

(2)   a.   Juan-**mi**   chayamun.
                 Juan-VIS   arrived
                 'Juan arrived.' (I saw it)
        b.   Parashan-**cha**
                 rains-INFR
                 'It must rain.' (I infer it)

Other languages that mark evidentiality morphologically are Bulgarian, Korean, Turkish and Tibetan. Often, the evidentiality marker may encode some additional grammatical property, e.g. tense/aspect in Turkish ((Izvorski 1997 a.o.).

      English has standardly been considered a language that encodes evidentiality lexically, e.g. via perception verbs or adverbs (cf. Papafragou et al. 2007):

(3)   a.   I saw/heard John sing.
        b.   John was allegedly singing.

Nevertheless, the following two English sentences do not carry the same information in terms of source of evidence: (4a) can be uttered regardless of whether the speaker has direct evidence about John winning the race, that is, regardless of whether the speaker saw or heard John winning, while (4b) can only be uttered if speakers have direct evidence of the event.

(4)   a.   It seems/looks/sounds like John won the race.
        b.   John seems/looks/sounds like he won the race.

Such pairs of sentences have been discussed in the syntactic and semantic literature and they are known as *copy raising* structures (Rogers 1971; Rogers 1971; Rogers 1973; Postdam & Runner 2001; Landau 2009). Asudeh & Toivonen (2012) provide a detailed analysis and draw attention to differences between *seem* and the rest of the verbs in (4), among other things, while pointing out that *seem* in copy raising is not the same as in the standard raising structures in that neither alternative (raised or unraised) is restricted to direct perception.[2] By focusing on copy raising pairs as in (4), Rett & Hyams (2014) end up considering the interpretive difference between (4a) vs. (4b) a difference in terms of evidentiality, which is thus taken to be encoded syntactically in English.

2.2. Evidentiality in Greek

In Greek too, there is no morphological device to mark evidentiality (cf. Tsangalidis 2012). Interestingly, previous works on the topic admit that, with the potential exception of a few lexical items, Greek does not encode source of evidence in grammar in the overall.[3]

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[2] And see Asudeh & Toivonen (2012) for details on what exactly raises in the copy raising sentences.
[3] Although Tsangalidis (2012) mentions that Veloudis (2001;2005) refers to the subjunctive marker 'na' as a complementizer in live reports.

Aikhenvald (2004) notes, quoting Friedman (2003), that Greek is rather unusual for a language spoken in the Balkans, especially in light of the easiness of diffusability of evidentials, in that it does not possess evidential categories, and Joseph (2003) conjectures that evidentials did not diffuse into Greek because of socio-cultural reasons and the attitude of the Greeks towards their language. Aikhenvald adds that the Greek adverb *taha* 'maybe, it seems, apparently', often referred to as a 'hesitation' marker, although treated by Ifantidou (2001) as a 'weak' evidentiality marker, has nothing to do with grammatical evidentiality, a statement with which we agree. Friedman (2003) adds that any language has lexical means for expressing a speaker's hedging, doubt, and attitude to information, and Greek has such a particle *leei* 'one says' meaning 'reportedly, allegedly', which can also acquire mirative extensions. According to Aikhenvald (2004), this particle could be, at most, an incipient reported evidential, comparable to Colombian Spanish *dizque*.

In what follows we present novel evidence challenging the consensus in the above literature on Greek, which, however, had admittedly only considered lexical or morphological strategies to encode evidentiality. The following examples show that, in a manner similar to English, different types of embedded clauses may perform the role of encoding source of evidence in Greek. Thus, with an indicative embedded sentence, introduced by the complementizer *oti* in (5a), the speaker may express either that they saw Nikos leaving, or that they did not see him leaving, but inferred that he left by seeing his belongings missing, for instance. The latter interpretation realizes a clear case of the (default) evidential, i.e. indirect evidence interpretation, encoded in grammar via a certain type of clause type, the indicative. The clause after the perception predicate may alternatively be a relative, formed with a distinct complementizer, *pu*, (5b), or a so-called subjunctive clause introduced by the particle *na*, (5c). The relative clause or the *na*-clause may only be uttered if speakers saw the event or the subject of the clause, that is, Nikos, leave.[4]

(5) a. Ida oti o Nikos efige.
     saw.1SG that the Nikos left.3SG
     'I saw that Nikos left.'
  b. Ida ton Niko pu efige.
     saw.1SG the Nikos that left.3SG
     'I saw Nikos leave.'
  c. Ida ton Niko na fevgi.
     saw.1SG the Nikos that leave.3SG
     'I saw Nikos leave.'

With this background in mind, we will turn our attention in the next section to the literature on how children acquire the means to encode evidentiality in the languages that have been investigated in this respect so far.

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[4] As Tsangalidis (2012) notes, it is an open question whether what he calls inferential evidentiality constitutes an extension of modality or not. This is definitely an important question. Nonetheless, it does not bear immediately on any of the claims of this paper.

3. *Acquiring the means to encode evidentiality*
There is a long line of research on children's acquisition of evidentiality, that is, on how and when children employ the appropriate grammatical means to encode direct and indirect evidence. Two general patterns seem to emerge repeatedly: a) use of the appropriate means to encode direct evidence precedes use of the means to encode indirect by at least a year, in both production and comprehension studies, and errors are in the form of replacing markers that encode indirect evidence with those encoding direct, and b) target performance on comprehension experiments follows target performance on production experiments, by two or even more years. Finally, results of experimental studies show later acquisition when compared to spontaneous speech data, also by a year or two.

3.1. *Morphologically encoded evidentiality*
Turkish is the first language that was investigated in terms of children's acquisition of evidential morphology. In a seminal study, Aksu-Koç (1988) asked 3- to 6-year-old children to describe events acted out with toys, which children either observed directly, or observed directly in the beginning and in the end of the event, and had to infer the process. The results showed that children from 3 to 3 and a half years old controlled the semantics and pragmatics of the direct morpheme (*-di*), with almost 90% target performance, where the same performance for the indirect morpheme (*-miş*) was achieved at age 4. Successful use of *-miş* in order to report something was observed at age 4 to 4 and a half (Aksu-Koç 1988; Aksu-Koç & Alp 2005). Use of *-dir* to indicate a deduction based on previous knowledge was not stabilized before 4 to 4 and a half (Aksu-Koç 1988). In comprehension studies children were asked to identify the speakers of utterances marked with *-di* vs. *-miş* and with *-di* vs. *–dir* in association with picture stories. The results confirmed the pattern of production studies, but a similar level of target performance was achieved about a year later: success in matching *-di* verbs with characters who perceived the event directly reached 80% target performance at about 4 and a half, while at the same age correct identification for *-miş* or *-dir* with characters who talked on the basis of inference from evidence or from previous knowledge reached 40% to 50% percent (Aksu-Koç 1988; Aksu-Koç 1998; Aksu-Koç & Alici 2000; Aksu-Koç et al. 2005). Ozturk & Papafragou (2007) obtained similar results with Turkish-speaking children between ages 5 and 7 for the *-di* and *–miş* morphemes they investigated. Children marked with *–di* the events they saw 98% of the time, while they marked with *–miş* events they inferred 52% of the time. A comparison between the production and the comprehension tasks confirmed that children performed better in the production task compared to comprehension. Other studies of languages with morphologically encoded evidentiality replicated the picture: Papafragou, Li, Choi & Han (2007) investigated the Korean *–e* and *–tay* morphemes, encoding direct evidence and hearsay respectively, and concluded that children's understanding of the morphemes are not quite in place at age 4. Yet, between 3 and 4 years of age Korean children seem to use correctly the above morphemes in production studies. On the other hand, the comprehension studies of Tibetan children by de Villiers et. al (2009) led the authors to conclude that children do not have the full system of evidentials in place even after the preschool years.

Aksu-Koç, Ögel-Balaban & Alp (2009) suggest that production experiments, even when successfully set, may not always create the state of consciousness that constitutes the appropriate cognitive context, with the consequence that children lag behind spontaneous speech performance. Comprehension studies, on the other hand, pose demands on children's working memory (e.g. keeping the linguistic form in memory), role taking abilities, and children's ability

to coordinate temporal and informational perspectives. By contrast, comprehension in natural discourse is not equally demanding, Aksu-Koç, Ögel-Balaban & Alp (2009) believe, as the speaker is present in the discourse and the child can directly interpret the point of view signified by the evidentiality marker.

In a recent study, Ünal & Papafragou (2016) focus on the production-comprehension asymmetry in acquiring evidential morphology, with the aim to attain a better understanding of it and, most importantly, to evaluate the two types of explanations that have been proposed to account for the production-comprehension asymmetries in language acquisition. The first line of explanations is a methodological one: according to it, delay in comprehension is due to factors that are extrinsic to the language domain under investigation (e.g. the tasks are metalinguistic, or they overload children's domain-general processing), and should disappear if the tasks reduce challenges or accommodate children's processing abilities. According to the second type of explanations, the psycholinguistic, the processes involved in comprehension and production are not just the same computations, executed in the reverse order, with comprehension overloading the system more than production. Instead, comprehension is some type of mental guessing game, in which the listener unpacks the meaning of the incoming linguistic expression and integrates the information with the information provided by the context and the speaker's intentions. In production, on the other hand, the speaker plans a message to convey the intended meaning, and, although the hearer's needs play a role in this process, the speaker plans and executes an utterance based on their resources and perspectives in mind. After running a series of experiments, in which task demands were gradually reduced, yet, no improvement in comprehension of evidentiality ensued, Ünal & Papafragou (2016) conclude that it presumably is the latter line of reasoning that is more plausible for understanding the delay in comprehension of evidential marking. In particular, after running a last task, in which children were asked to assess how evidence and knowledge are linked outside of language, for themselves and for others, the authors argue that the comprehension delay seems to be due to the psycholinguistic process of linking evidentials to others' knowledge of source of evidence, confirming the findings of their previous tasks in that the methodological explanations are not on the right track. Concretely, the authors found that children had difficulty reasoning about other's evidence in non-linguistic tasks, but the difficulty was decreased when the tasks involve accessing their own source of evidence. The experiment of Ünal & Papafragou (2016) played important role in our study, which, as discussed in what follows, was designed so that that the participants rely on their own source of evidence/mental perspective. Before we present the study, we will display in what follows the studies of Rett & Hyams (2014) as well of Winans et al. (2015), which constituted the motivation for ours and share with it the component of grammar in which evidentiality is mapped, namely, syntax.

3.2. Syntactically Encoded Evidentiality

By focusing on pairs of sentences such as in (4), Rett & Hyams (2014) proposed that evidentiality may be expressed syntactically in English. Moreover, unlike in several languages that express evidentiality morphologically, but the same morpheme encodes additional grammatical properties, e.g. tense/aspect, the contrast between (4a) and (4b) is only in terms of perception. On the other hand, evidentiality is encoded optionally in English.[5] Rett & Hyams

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[5] It is not entirely clear to us what 'optionally' means, other than that the unraised variant of the relevant sentences is associated with either direct or indirect evidence.

analyzed the data of 45 American English-speaking children between the ages of 2 and 7 from the CHILDES database. They found 70 utterances with the verbs *look*, *sound* and *see* (Perception Verb Similatives, PVS, in their terms) in the relevant constructions, 55 of which were unambiguous in terms of their syntax and their source of evidence. Of these 55 utterances, 21 had a raised subject and the rest 34 had their subjects unraised, as shown Table 1 that follows (Table 4 of Rett & Hyams):

TABLE 1
PVSs and Evidence Source in English-Speaking Children

	Syntax		
Evidence	*Raised*	*Unraised*	*Total*
Direct	21 (52%)	20 (49%)	41
Indirect	0	14 (100%)	14
Total	21	34	55

As the table shows, the 34 instances of unraised subjects were used either for direct, 20/34, or indirect, 14/34, evidence by children. On the other hand, utterances with raised subjects were employed exclusively for direct evidence, 21/21. Rett & Hyams take these findings to suggest that English-speaking children, from very young ages, know that the raised option of PVSs require a subject that is the source of perception, whereas the unraised alternative may encode indirect evidence. In addition, Rett & Hyams (2014) examined data of standard raising constructions with *seem* as in (6):

(6)   a.   John seems to have won the race.
         b.   Bill seems to be sick.

These sentences are different from the raised variants of copy raising because, as already mentioned, they are equally acceptable in contexts of direct or indirect evidence in the adult grammar. Rett & Hyams discovered, by using production data from CHILDES again, that the same children allow indirect evidence with the raised version of *seem*, (6). Table 2 below is Rett & Hyam's Table 7:

TABLE 2
Standard Raising and Evidence Source in English-Speaking Children

	Syntax		
Evidence	*Raised*	*Unraised*	*Total*
Direct	12 (75%)	1 (33%)	13
Indirect	4 (25%)	2 (66%)	6
Total	16	3	19

The findings in the above Table are used to confirm that the findings of Table 1 are not due to some tendency children have to associate raising with direct evidence. Rather, children seem to know that only in the copy raising sentences the variant with the raised subject cannot encode indirect evidence.

In subsequent work, Winans et al. (2015) undertook a comprehension study of syntactically encoded evidentiality in English, carried out with 4- to 6-year-old children and adult controls. Participants were administered a felicity judgment task in which they were presented with pairs of pictures. Children and adults heard either version of the copy raising sentences (PVSs) in (4) from a puppet, and were asked whether the sentences they heard matched the evidence provided by the pictures. One of the pictures provided direct evidence and the other indirect. Adult speakers confirmed the contrast in (4), and accepted raised sentences with an indirect evidence scenario in the picture 23% of the time, whereas 93% of the time with a direct evidence scenario. On the other hand, they accepted unraised sentences with direct evidence scenario 91% of the time, and 77% of the time with indirect evidence. Hence, raised sentences were much more likely to be accepted with a direct evidence scenario than with indirect, while the latter were much more likely to be accepted by sentences with unraised subjects. Children showed no such correlation, and no significant effect of age; in particular, while percentages changed slightly across the age groups, the difference among them was minimal and did not reach significance. Most importantly, children equally accepted a raised sentence with direct evidence as with indirect evidence.

The authors point out the comprehension vs. production asymmetry also found in other studies, namely, that children even from age 2 used raised sentences in a felicitous manner, at least in naturalistic data, but are not able to comprehend in the relevant experiments which form matches which source of evidence up to much older ages. They hold that this asymmetry seems to be independent of the methodology used in the various comprehension experiments across languages, and of the type of language investigated. Winans et al. provide a number of potential factors as responsible for the low performance of the children they assessed on the comprehension tasks. These factors are, first, the authority of the speaker (in this case of the puppet) that utters the sentence to be assessed, which children do not seem to be able to challenge. Then, the experimental tasks rely on the participant interpreting the evidential on the basis of the immediate context only, while evidential information is generally not discourse-bound, and this is something else that children cannot overcome. Finally, as Winans et al. claim, children may ignore the matrix subjects of the test sentences in English, with the consequence that what is left of the sentence is unmarked for source of evidence. The authors suggest that future experiments should avoid these confounds, and the study to be reported in the remainder of the paper has indeed tried to avoid the first two (see discussion in Section 4.1.2). The third factor is not applicable to the Greek task, because the subject of the relevant sentences is embedded into an imperative, hence cannot be similarly ignored (see following section). Interestingly, the first of these confounds, namely, the 'authority' of the puppet, seems to fall into what Ünal & Papafragou (2016) consider 'other's source of evidence' for which they believe it may be crucially involved in the delayed comprehension of evidentiality.

4. *Children's comprehension of Evidentiality in Greek*
As was demonstrated in section 2, Greek encodes evidentiality syntactically. Thus, when the sentential complement of a perception verb such as *see*, for instance, is an indicative, the evidence of the speaker with respect to the content of this sentence can be either direct or

indirect, that is, the speaker does not have to have seen the event while occurring, or the subject of the embedded sentence acting, but could as well infer it. On the other hand, when the complement is a relative or a subjunctive sentence, the speaker has to have direct perception of the event reported by the embedded sentence. In this work we investigate when Greek-speaking children attain this knowledge, by focusing on the comprehension of indicative and relative embedded sentences, namely, sentences such as (5a) and (5b), repeated below.

(5)   a.   Ida   oti   o   Nikos efige.
              saw.1SG that   the   Nikos left.3SG
              'I saw that Nikos left.'
    b.   Ida   ton   Niko   pu   efige.
              saw.1SG the   Nikos that   left.3SG
              'I saw Nikos leave.'

4.1. Methodology
4.1.1 Participants
The participants of the study were 100 Greek-speaking children and 30 adults. The children were divided into four groups of 25 each, according to their elementary school grade. They were recruited from public schools in Patras, Pireaus and Neapolis (Lakonia). Adults were, in their majority, students from the various Departments of the University of Patras, except from the Departments of Linguistics and Speech-Language Therapy.

TABLE 3
Children Participants

| Grade	N	Mean age	Age range	Standard deviation
2	25	7;9	7;0-8;4	0.35
3	25	8;10	8;3-9;10	0.46
4	25	9;9	9;4-10;4	0.32
5	25	11	10;3-11;6	0.36

4.1.2 Materials
In order to investigate whether Greek-speaking children comprehend the difference that the embedded clause type makes in terms of encoding source of evidence, we constructed the four conditions in (7). These involve indicative and relative sentential complements of the verb *dixni* 'shows', and each of them is made to be associated with direct and indirect perception of the event reported by the sentential complement. Of these conditions, (7b) is infelicitous because embedded relative sentences cannot encode indirect evidence in the adult grammar. We used the verb *show(s)* to embed indicative or relative sentential complements, instead of some run-of-the-mill perception verb, because it allows for a subject that does not refer to an individual (i.e. *the picture* in (8) below), hence, children do not have to consider some other individual's source of evidence or mental perspective for their responses, but only their own.

(7)   a. Indicatives – Indirect evidence   c. Indicatives – Direct evidence
          b. Relatives – Indirect evidence   d. Relatives – Direct evidence

Administration of the experiment proceeded as follows: first, participants were familiarized with the notion of direct and indirect evidence, by being shown two pairs of pictures, such as in Figure 1. For a pair such as in Figure 1, they were told that in the left picture someone/the boy is painting, while in the right picture someone/the boy has already painted a picture, but we don't see him because he left the room to go to some other place.

Figure 1
Pair of familiarization pictures
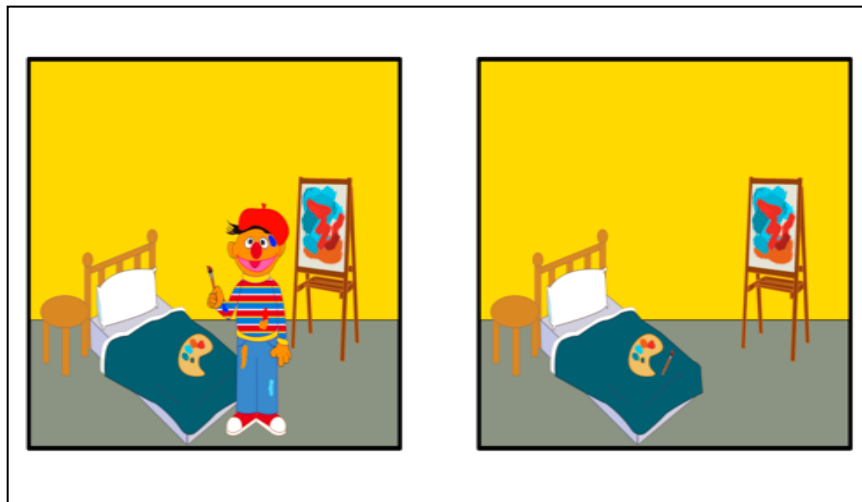
We then proceeded to the main experiment. Participants were shown sets of three pictures, two of which were open, while the third was hidden (Figures 2-3). One of the two open pictures was a filler, in the sense that it was unrelated to the story provided by the sentences children heard. Of the related open pictures, one was depicting direct evidence (Figure 2) and the other indirect (Figure 3). On the other hand, the hidden picture in Figure 2 depicted indirect evidence and in Figure 3 direct.

Figure 2
Open picture/Direct evidence,
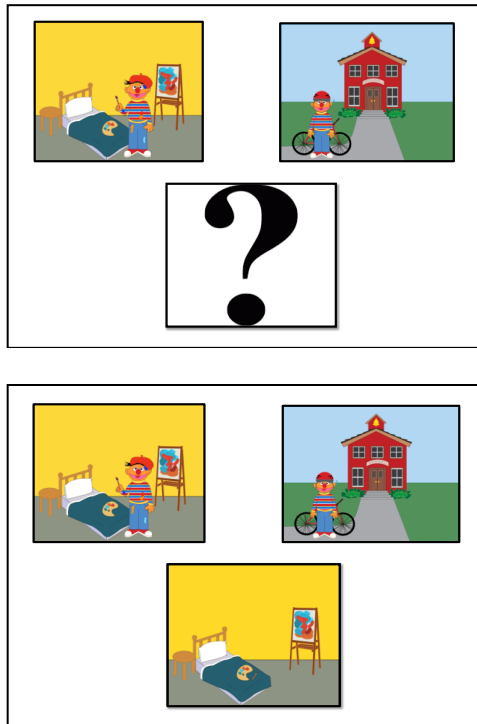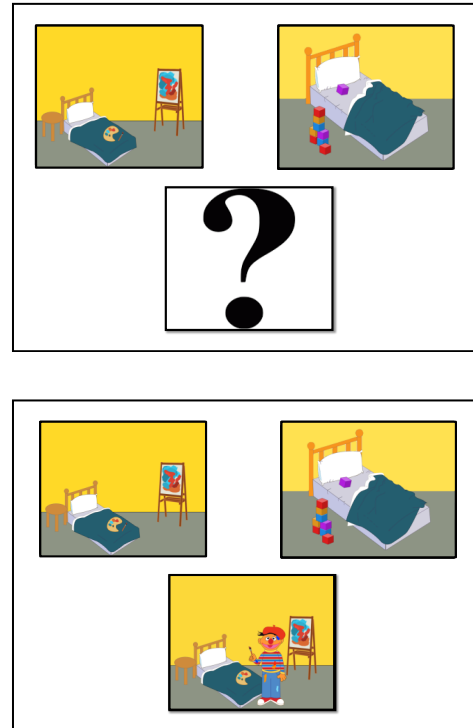before and after opening third picture

Figure 3
Open picture/Indirect evidence,
before and after opening third picture

When participants were shown Figure 2, they received the instruction in (8a) followed, by either (8b) or (8c). This was repeated for Figure 3.

INSTRUCTION SENTENCE
(8)   a. Dikse   mu   tin   ikona pu   dixni …
            Show.2SG.IMP   me   the   picture that   show.3SG
            'Show me the picture that shows…'

INDICATIVE EMBEDDED CLAUSE
       b. oti   kapios   zografise   enan   pinaka.
            that   someone   painted.3SG   a   picture

RELATIVE EMBEDDED CLAUSE
       c. kapion   pu   zografise   enan   pinaka.
            someone   that   painted.3SG   a   picture

The task of the participants was to point to the open picture of the three-picture set that they thought matched sentences (8a) or (8b). If they thought the open pictures did not match the sentence they heard, they were instructed to open the third (hidden) picture, which had the opposite value for evidentiality than the corresponding non-filler open picture. Hence, Figure 2 was presented with both an indicative and a relative complement sentence. The open picture,

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which depicted direct evidence, was an option for both the indicative sentence and the relative sentence that participants heard. Likewise, Figure 3 was presented with both clause types. The open picture, depicting indirect evidence this time, was an option for indicatives, but not for the relative embedded sentences, hence, participants had to uncover the third picture in this case. Therefore, with indicative sentential complements participants could but did not have to uncover the third picture, regardless of source of evidence. With relative complements, they should not uncover the third picture when the related open pictures showed direct evidence; they should uncover it, however, when it showed indirect. The same scenario, e.g. of someone painting a picture, was presented in blocks of four sentences, and one such block follows:

TABLE 4
Representative block of sentences

Condition	Sentences	Target Picture
(i)= (7a)	Show me the picture that shows that someone painted a picture.	2
(ii)=(7b)	Show me the picture that shows someone who painted a picture.	3
(iii)=(7c)	Show me the picture that shows that someone painted a picture.	1
(iv)=(7d)	Show me the picture that shows someone who painted a picture.	1

There were 6 scenarios such as the one in Table 4, hence, participants heard 24 sentences in total. The order of sentences was pseudorandomized within each block, and the filler picture was not always in the same position with respect to the other open picture. The pictures were the same as those used in the comprehension experiment of Winans et al. (2015), but they were administered in a different manner, namely, not as the felicity judgment of a two-picture task they employed, but in the manner just described.

Notice that, following the suggestions in Winans et al. (2015), instructions were given to the participants via the imperative form of the verb, *dikse mu* 'show me', in order to avoid confounds such as experimenter's authority and in order to make sure participants use their own mental perspective about what they perceive. Moreover, no puppet was used, hence, 'puppet's authority' did not interfere either. Recall also that the fact that the verb under which indicative and relative sentences were embedded was (also) *show*, rather than a mainstream perception verb, permitted to not have an individual as the subject of this sentence, as children would then have to take this individual's mental state or source of evidence into consideration as well, with the consequences argued for in Ünal and Papafragou (2016). It should be noted that we tried a number of alternative manners to administer the task, in order to have even the adult participants differentiate source of evidence according to embedded sentence type. We started with a two-picture matching task, as in Winans et al., and switched to the three-picture task with one hidden picture that we described. Moreover, we started the latter task with a definite DP subject of the embedded sentence, e.g. *the boy*, and switched to a quantifier, i.e. *someone*. We believe the latter modification may have contributed to rendering the sentences less restricted to the immediate context, thus amending another potential confound suggested by Winans et al: using a definite subject DP requires an individual matching the specific properties referred to by this DP. On the other hand, a quantifier subject, e.g. someone, has the potential of making one consider different individuals with more general properties, hence, consider additional contexts. Finally, the fact

that participants had to be actively involved in the experiment, in the sense that they had to open a hidden picture in order to match the sentence they heard, may have also been a positive aspect.

5.   Results

This section presents the results.   These are not reported in terms of target or non-target responses because either type of evidence can be considered target for embedded indicative sentences, hence, indicatives are not directly comparable to embedded relatives, for which there is only one target answer, i.e. direct evidence. Because of this asymmetry, we are presenting the results in terms of the rates at which the participants of the study were satisfied with one of the two open pictures and did not uncover the third (hidden) one.

To investigate differences between the groups in Conditions (i) vs. (ii), a repeated measures ANOVA was conducted with Group (2nd, 3rd, 4th, 5th Grade, adults) as between groups factor and Condition (Indicative, Relative) as a within groups factor. This showed a main effect of Group [$F_{(4, 125)} = 16$, $p < 0.001$, $\eta^2 = 0.34$], a main effect of Condition [$F_{(1, 125)} = 115.77$, $p < 0.001$, $\eta^2 = 0.48$], and an interaction between Group and Condition [$F_{(4, 125)} = 13.2$, $p < 0.001$, $\eta^2 = 0.3$]. This was followed up by pairwise comparisons using Bonferroni correction to uncover differences between the groups in each condition. In the Indicative-Indirect condition there was no significant difference between any of the five groups (in all comparisons $p > 0.05$). In the Relative-Indirect condition the 2nd Grade differed significantly from the 4th and 5th Grade as well from the adults (all comparisons $p < 0.001$). The 3rd Grade differed significantly from the 4th Grade ($p = 0.006$), the 5th Grade ($p = 0.003$) and the adults ($p < 0.001$). The 4th and 5th Grade did not differ from each other and from the adults. Pairwise comparisons were also made to uncover differences between the two conditions within each group. These showed significant differences between the two conditions in the 4th and 5th Grade, as well as in the adults (all comparisons $p < 0.001$), but not significant differences in the 2nd and 3rd Grade.

Similar analyses were conducted to investigate differences between the groups in conditions (iii) vs. (iv). The repeated measures ANOVA with Group (2nd, 3rd, 4th, 5th Grade, adults) as a between groups factor and Condition (Indicative, Relative) as a within groups factor showed a main effect of Group [$F_{(4, 125)} = 5.95$, $p < 0.001$, $\eta^2 = 0.16$], a main effect of Condition [$F_{(1, 125)} = 10.68$, $p = 0.001$, $\eta^2 = 0.08$], and an interaction between Group and Condition [$F_{(4, 125)} = 5.46$, $p < 0.001$, $\eta^2 = 0.15$]. This was followed up by pairwise comparisons using Bonferroni correction to uncover differences between the groups in each condition. In the Indicative-Direct condition the 2nd Grade differed significantly from the 4th and 5th Grade as well from the adults (all comparisons $p < 0.001$). All other groups of children did not differ from each other and from the adults. In the Relative-Direct condition there was only a significant difference between the 3nd Grade and the adults ($p < 0.034$). Pairwise comparisons were also made to uncover differences between the two conditions within each group. These showed significant differences between the two conditions in the 4th Grade ($p = 0.041$) and in the adults ($p < 0.001$), but not significant differences in the 2nd, 3rd and 5th Grade.

TABLE 5

Satisfaction of participants with the open picture

Condition	2nd Grade	3rd Grade	4th Grade	5th Grade	Adults
(i) Indicative-Indirect					
Mean	79.33	65.33	70.00	72.67	77.22
SD	8.71	19.79	15.21	17.92	25.7
Range	50-83.33	33.33-100	33.33-83.33	16.67-83.33	0-100
(ii) Relative-Indirect					
Mean	76	54.67	26.67	24.67	17.22
SD	34.05	30.63	32.27	26.41	16.66
Range	0-100	0-100	0-100	0-83.33	0-50
(iii) Indicative-Direct					
Mean	92.67	71.33	59.33	56.67	57.78
SD	16.02	28.67	29.3	29.27	31.18
Range	33.33-100	16.67-100	16.67-100	16.67-100	0-100
(iv) Relative-Direct					
Mean	80.67	72	76	73.33	91.67
SD	31.06	27.1	23.11	25.91	12.18
Range	0-100	16.67-100	16.67-100	0-100	66.67-100

5.1. A potential confound rejected

A first and clear finding from Table 5 and the statistical analysis in the previous section is that younger children did not differentiate on indirect evidence between the two sentence types, (i) and (ii), despite the fact that entirely different responses are expected for each of them. In other words, children of 2nd and 3rd grades behave on embedded relative sentences, (ii), very closely to how they behave on embedded indicative sentences, (i), in that they stick to the indirect evidence scenario provided to them in one of the two open pictures and do not uncover the hidden picture, despite the fact that when the embedded sentence is a relative it is incompatible with indirect source of evidence. It is not unreasonable to think that younger children have trouble uncovering the hidden picture, for all sorts of reasons that have nothing to do with the issue under investigation.

In order to exclude the possibility that younger children do not like to uncover the third picture, we created a short task of exactly the same type, but assessing a different domain, namely, locative relations, such as *inside, outside, behind, in front*, *under*, etc. It is known that such expressions have already been mastered by children of the age groups that participate in this study (Terzi & Tsakali 2009; Terzi, Tsakali & Zafeiri 2015, and references therein). Therefore, if children still do not open the hidden picture when they should, it means that the task is not appropriate for their age. A representative three-picture set follows immediately below, assessing *in front*. For this set, children were asked to tell whether 'the cat was in front of the box' in any of the open pictures, and, if not, to uncover the third one.

Figure 4
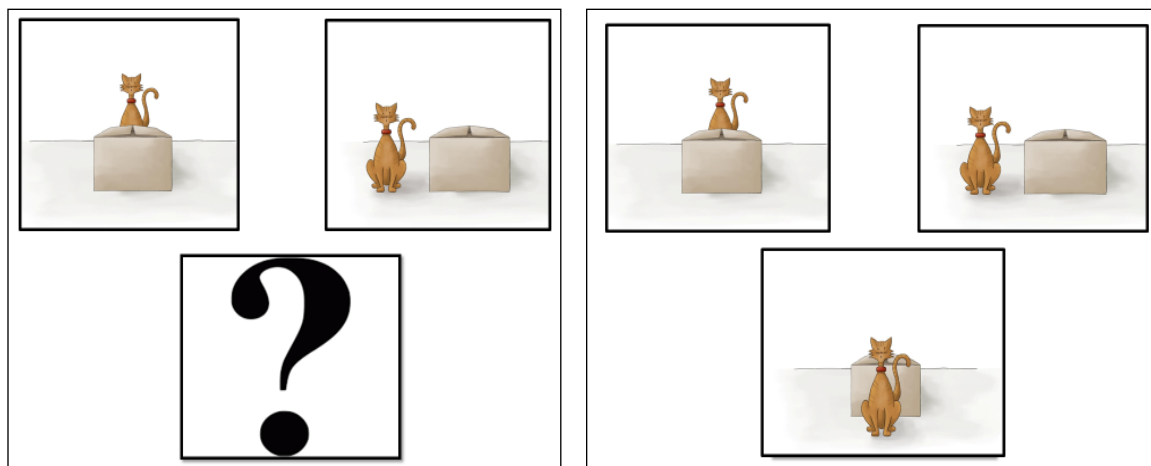
The task was administered to the 2nd grade group first and the result was ceiling performance, thus we did not see the need to administer it to the 3rd graders as well. We concluded that the high rate of satisfaction that 2nd and 3rd graders expressed for indirect evidence associated with embedded relative sentences, as manifested by their reluctance to open the hidden picture of the three-picture set, was not a task effect. Instead, younger children are indeed happy with indirect evidence for embedded relative sentences, in clear contrast with older children and adults, who, in their overwhelming majority do not accept this mapping of source of evidence and embedded sentence type.

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6.   Production

In order to attain a thorough understanding of children's encoding of evidentiality it is important to also investigate production/naturalistic data in the same domain. We undertook this task by searching through two sources that are available for early Greek spontaneous speech and we present the results immediately below, so that we discuss the findings altogether in the end.

The first source was the CHILDES database. For Greek, CHILDES contains files from 6 children, the older one of which is 2;11 and the younger 1;7. We found just a few relative sentences, even from age 2;5. There were even fewer indicative embedded sentences. Note that the American English CHILDES database contains data from 853 children from 2 to 7 years old (and 1778 children altogether from 2 weeks to 12 years old). As mentioned earlier, the findings of Rett & Hayms (2014) were extracted from the spontaneous speech of 45 children. We do not know whether the authors searched into more than the 45 files they report, but, still, 45 children, some of which were up to age of 7, cannot compare with the amount of data that are available for Greek in CHILDES.

The other body of data that we searched consisted of the narratives of 20 children comprising the control group in a study of the language abilities of children with autism. These were children between 5;1 and 8;2 years old who narrated the "Frog where are you?" wordless picture story (Mayer 2003). Their behavior in terms of felicitous reference of subject and object pronouns is reported in Terzi et al. (2017) and Terzi et al. (2019). We found a number of relative sentences in the narratives of these older children, but none was in a relevant context. There were, however, three indicative sentences, each uttered by a different child, ages 6;2, 6;3, 7;11. Yet, all three sentences encoded direct perception, thus, they could not provide conclusive information regarding mapping of evidentiality to sentence type.

All in all, we have no evidence for early knowledge of the direct vs. indirect encoding of evidentiality via the production data of Greek-speaking children, but this could just be due to the lack of sufficient data. The amount of data that served in the English naturalistic study of Rett & Hyams (2014) indicates that it will probably take long before similar findings and conclusions can be drawn for early Greek. We thus turn to the discussion of the comprehension study we have reported.

7.   Discussion

The main purpose of this study was to find out when and how Greek-speaking children map the source of evidence associated with an utterance onto a specific syntactic structure, puzzled by the fact that the most recent study on syntactically encoded evidentiality of Winans et al. (2015) did not detect mastery of evidentiality in their comprehension study of English, which is the only other studied language that encodes evidentiality in the syntax. Discovering this knowledge via naturalistic production data in Greek has not been possible, as just reported, due to insufficient data. Therefore, our discussion and associated conclusions will be drawn from the comprehension study we undertook, the results of which appear in Table 5.

Some of the most crucial evidence of the study is provided by the first two rows of Table 5, both in terms of how each row proceeds and eventually compares to adults, and in terms of how the difference between the two rows develops. Recall that the first raw, (i), reports the findings on the condition in which participants see sets of three pictures where the open one provides indirect evidence, and they hear an indicative embedded sentence. Since indicative sentences are compatible with indirect evidence, participants do not have to open the hidden picture (although it would be licit to do so). Indeed, children from the earliest years do not open

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the third picture much and do not differ significantly in this respect, neither between age groups nor with adults.

The second row, (ii), reports on the condition in which the related open picture, which provides indirect evidence again, is mapped to a relative embedded sentence, a mapping that is banned by adult grammar. When faced with this mapping, participants should not be satisfied with any of the open pictures and should opt for the hidden picture in search of direct (target) evidence. Yet, children of the two younger groups, whose performance does not differ significantly from each other, did not open the third picture. This is not because they are reluctant to open a hidden picture, as was confirmed by the task in 5.1. Rather, younger children most likely are not aware of the ban on this mapping. Starting from the third age group, however, which is after age 9, children diverge radically and are not satisfied with the open picture of this condition anymore; they open the hidden picture in search of direct evidence, and differ significantly from the first two age groups in this respect. Moreover, starting from this age group again, children do not differ significantly from adults. This is an important finding, demonstrating that it is only after the age of 9 that Greek-speaking children behave like adults in terms of mapping indirect evidence overwhelmingly with indicative sentential complements, but not with relatives. Recall that the comprehension study of Winans et al. (2015) was not able to detect knowledge of children's mapping source of evidence to a particular syntactic structure, but their study only investigated children up to age 6, an age at which Greek-speaking children do not demonstrate felicitous mapping either in the comprehension study we conducted.

The above findings are also supported by the fact that, starting from the third age group again, children's behavior differs significantly between indicative and relative clauses in terms of mapping indirect evidence. Before then, children do not differentiate significantly between the two conditions, hence, 79,33% vs. 76% satisfaction with the open picture for indicatives and relatives respectively for the first age group (2rd grade) and 65,33 vs. 54,67% for the second age group (3rd grade). At 4th grade, however, which is after age 9, the difference increases dramatically to 70% vs. 26%, it becomes statistically significant, and is very close to the difference that 5th graders and adults display on indirect evidence between the two clause types. Recall that the study of Winans et al. (2015), which investigated children's behavior up to age 6, found that they equally accepted a raised sentence with direct evidence as with indirect evidence. In a similar manner, our study found that children equally accept mapping of indirect evidence to either an indicative or a relative embedded sentence even up to age 8, and only start to differentiate after age 9.

Let us now move next to the last two rows of Table 5, which report responses on direct source of evidence for both embedded clause types. For indicative sentential complements, (iii), for which direct evidence is the option in the relevant open picture, we notice immediately a rather peculiar pattern displayed by adults: although one would expect them to be satisfied with the direct evidence provided in the open pictures, they choose to open the hidden picture at a rate of 57%. We take this to mean that adults have developed a preference for indicatives and indirect evidence, despite the fact both sources of evidence can be mapped to indicatives. Children do not start out like this; instead, they approach adult behavior in this respect after age 9, that is, at 4th and 5th grades, while, during 3rd grade, they do not differ significantly neither from the younger group nor from the older groups or adults. We see therefore that children's behavior on this condition, in the sense of developing a preference for associating indicative sentential complements with indirect evidence begins at the same age they begin to pattern with adults in knowing that indirect evidence is incompatible with relative complements (condition ii).

Finally, row (iv) reports on embedded relative sentences and direct evidence, which is the only evidence compatible with this clause type. Adults seem to know this well, hence, they are satisfied with mapping of direct evidence to embedded relatives at a rate of about 92% and do not open the hidden picture. Although children display similar behavior at much lower rates, they do not differ significantly from adults, with the exception of the 3rd graders. We do not think this finding means that children pattern adult behavior from earliest ages, however. Rather, 2nd grade children do not attempt to open the hidden picture just because they do not know yet what evidence can be mapped with relative clauses, as we concluded in the discussion of condition (ii). At 3rd grade, which is right before age 9, children still do not know, as also concluded in the discussion of condition (ii), but they are in a transitional stage of figuring out things, a consequence of which is their significant divergence from adult behavior. After 4th grade however, when we know from condition (ii) that children do not map indirect evidence with embedded relatives any more than adults, their behavior on direct evidence and embedded relatives starts to not differ from that of adults either. However, although they do not differ significantly from adults on condition (iv) after 4th grade, they are satisfied with direct evidence at lower rates than adults. We conjecture this is due to a number of reasons: children may not always keep track of what the hidden picture contains, hence, they open it thinking that it is another licit option. Notice that they do that at very similar rates as in condition (i), where they do not have to open the hidden picture, yet they do. Finally, the difference between the two conditions, which is significant in adult group, is also significant at the 4th and 5th grades. Taken together, therefore, the results from conditions (iii) and (iv) demonstrate that children's performance, even on direct evidence, resembles that of adults starting from 4th grade, that is, after age 9 as well.

Before concluding, we will return to condition (ii), which maps indirect evidence and embedded relative sentences, and was decisive for claiming that children after age 9 comprehend that this mapping is illicit in adult grammar, hence, they were considered to have mastered mapping of source of evidence with embedded clause type. Recall that this claim was based primarily on the fact that from this age on children do not differ from adults on how they treat this particular condition, the assumption being that adults treat it right. But do adults indeed treat it right? Note that the last cell of condition (ii) in Table 5 demonstrates that adults are satisfied with the illicit mapping of indirect evidence and relative embedded clauses at a rate of about 17%, which is an important acceptability ratio. It should be reminded that the adults of Winans et al. (2015) also accepted illicit mapping, i.e. the raised version of sentences such as in (4) with indirect evidence, at an even higher rate, that is, 23%. One wonders therefore why this is so. In order to understand the behavior of the Greek-speaking adults of our study, we ran through their responses carefully. What we noticed was that 9 out of 30 adults committed those errors only in the first two blocks of sentences, 4 out of 30 committed such errors up to the third block, while the remaining blocks were error free (see Table 4 for one such block of sentences). It is difficult to nail down what exactly is responsible for this behavior of these 13 participants. One possibility that comes to mind is that those particular participants paid less attention to the syntactic structure in the beginning of the experiment, while they started to focus later. Indeed, two adults we asked during piloting whether the two sentences they would hear are uttered in different circumstances told us that they heard the same sentence. Note, however, that, by contrast to adults, children's errors on the same condition were found throughout the whole experiment. However, we believe it is unreasonable to hold that, on similar grounds, children did not pay attention throughout the whole experiment. For one thing, we did not have instances in

which children chose the filler sentence. Moreover, they made no errors in the short experiment of section 5.1.

8.　　Conclusion

We have reported in this paper the results of a comprehension study on how and when source of evidence is encoded in the syntax of Greek-speaking children. Our study took into consideration a number of factors which, according to Winans et al. (2015) may have affected their comprehension experiment with the consequence that they did not detect knowledge of mapping source of evidence to syntactic structure up to the age of 6 that they investigated. Some of these issues were also held responsible in the more recent study of Ünal and Papafragou (2016). Despite the fact that, as we believe, we have kept the current study clean of the pitfalls suggested by the previous studies, Greek-speaking children did not appear to master this property of sentential complements before age 9. This leads us to believe that the interference of other's authority or mental perspective are not the only possible factors that are responsible for the late age in which children align with adults in comprehension experiments of evidentiality. The immediate consequence of this conclusion is that future research must look into what these additional factors are.

References

Aikhenvald, Alexandra Y. 2003. Evidentiality in Tariana. In Alexandra Y. Aikhenvald & Robert M. W. Dixon (eds.), *Studies in Evidentiality*, 131–164. Amsterdam: John Benjamins.

Aikhenvald, Alexandra Y. 2004. *Evidentiality*. Oxford: Oxford University Press.

Aksu-Koç, Ayhan. 1988. *The Acquisition of Aspect and Modality: The Case of Past Reference in Turkish*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511554353.

Aksu-Koç, Ayhan. 1998. Changes in the basis for children's assertions: The acquisition of–DIr. In *Proceedings of the 9th International Conference on Turkish Linguistics*. Oxford.

Aksu-Koç, Ayhan & Didem Mersin Alici. 2000. Understanding sources of beliefs and marking of uncertainty: The child's theory of evidentiality. In Eve V. Clack (ed.), *Proceedings of the 13th Child Language Research Forum*, 123–130.

Aksu-Koç, Ayhan & İ Ercan Alp. 2005. Relations between source monitoring and linguistic encoding of evidentiality. In *Proceedings at the biennial meeting of the Society for Research in Child Development*. Atlanta, GA.

Aksu-Koç, Ayhan, Çağla Aydin, G. Avci, N. Sefer & Y. Yaşa. 2005. The relation between mental verbs and theory of mind performance: Evidence from Turkish children. *International Association for the Study of Child Language*.

Aksu-Koç, Ayhan, Hale Ögel-Balaban & İ Ercan Alp. 2009. Evidentials and source knowledge in Turkish. *New Directions for Child and Adolescent Development* 2009: 13–28. https://doi.org/10.1002/cd.247.

Asudeh, Ash & Ida Toivonen. 2012. Copy raising and perception. *Natural Language & Linguistic Theory* 30: 321–380. https://doi.org/10.1007/s11049-012-9168-2.

Friedman, Victor. 2003. Evidentiality in the Balkans with special attention to Macedonian and Albanian. In Alexandra Y Aikhenvald & Robert M. W. Dixon (eds.), *Studies in Evidentiality*, 189–218. Amsterdam: John Benjamins.

Ifantidou, Elly. 2001. *Evidentials and Relevance*. John Benjamins Publishing.

Izvorski, Roumyana. 1997. The Present Perfect as an Epistemic Modal. In Aaron Lawson (ed.), *Proceedings of the 7th Semantics and Linguistic Theory Conference*, 222–239. https://doi.org/10.3765/salt.v7i0.2795.

Joseph, Brian D. 2003. Evidentials. In Alexandra Y Aikhenvald & Robert M. W. Dixon (eds.), *Studies in Evidentiality*, 307–327. Amsterdam: John Benjamins.

Landau, Idan. 2009. This Construction Looks Like a Copy is Optional. *Linguistic Inquiry* 40: 343–346.

Mayer, Mercer. 2003. *Frog, Where Are You?* New York: Dial Books.

Murray, Sarah E. 2017. *The Semantics of Evidentials.* Oxford: Oxford University Press.

Ozturk, Ozge & Anna Papafragou. 2007. Children's Acquisition of Evidentiality. In Heather Caunt-Nulton, Samantha Kulatilake, & I-hao Woo (eds.), *Proceedings Supplement of the 31st Annual Boston University Conference on Language Development*.

Ozturk, Ozge & Anna Papafragou. 2016. The Acquisition of Evidentiality and Source Monitoring. *Language Learning and Development* 12: 199–230. https://doi.org/10.1080/15475441.2015.1024834.

Papafragou, Anna, Peggy Li, Youngon Choi & Chung-hye Han. 2007. Evidentiality in language and cognition. *Cognition* 103: 253–299. https://doi.org/10.1016/j.cognition.2006.04.001.

Postdam, Eric & Jeffrey T. Runner. 2001. Richard returns: Copy Raising and its implications. In Mary Andronis, Chris Ball, Heidi Elston & Sylvain Neuvel (eds.), *Proceedings of the 37th Chicago Linguistic Society*.

Rett, Jessica & Nina Hyams. 2014. The Acquisition of Syntactically Encoded Evidentiality. *Language Acquisition* 21: 173–198. https://doi.org/10.1080/10489223.2014.884572.

Rogers, Andy. 1971. Three kinds of physical perception verbs. In Douglas Adams, Mary A. Campbell, Victor Cohen, Julie Lovins, Edward Maxwell, Carolyn Nygren, & John Reighard (eds.), *Proceedings of the 7th Chicago Linguistic Society Conference*, 206–222.

Rogers, Andy. 1973. *Physical perception verbs in English: A study in lexical relatedness*. UCLA Unpublished PhD dissertation.

Terzi, Arhonto, Theodoros Marinis, Anthi Zafeiri & Konstantinos Francis. 2019. Subject and Object Pronouns in High-Functioning Children With ASD of a Null-Subject Language. *Frontiers in Psychology*. Frontiers 10. https://doi.org/10.3389/fpsyg.2019.01301.

Terzi, Arhonto & Vina Tsakali. 2009. On vs above: lexical semantics and syntactic factors affecting spatial acquisition. In Jane Chandlee, Michelle Franchini, Sandy Lord & Gudrun-Marion Rheiner (eds.), *Proceedings of the 33rd Annual Boston University Conference on Language Development*, 540–551. Somerville, MA: Cascadilla Press.

Terzi, Arhonto, Vina Tsakali & Anthi Zafeiri. 2015. Does Language Structure Affect Acquisition of Spatial Terms? In G. Papanastasiou, D. Koutsogiannis & M. Theodoropoulou (eds.),

Proceedings of the 35th Annual Meeting of the Linguistics Department of the University of Thessaloniki, 533–545. University of Thessaloniki.

Terzi, Arhonto, Anthi Zafeiri, Theodoros Marinis & Konstantinos Francis. 2017. Object Clitics in the Narratives of High-Functioning Children with Autism. In Maria LaMendola & Jennifer Scott (eds.), *Proceedings of the 41st Annual Boston University Conference on Language Development*, 637–650. Somerville, MA: Cascadilla Press.

Tsangalidis, Anastasios. 2012. Evidentiality and Modality: Evidence from Emerging Evidentials in Greek. Presentation at *Nature of Evidentiality, Leiden University*.

Ünal, Ercenur & Anna Papafragou. 2016. Production–comprehension asymmetries and the acquisition of evidential morphology. *Journal of Memory and Language* 89: 179–199. https://doi.org/10.1016/j.jml.2015.12.001.

Villiers, Jill G. de, Jay Garfield, Harper Gernet-Girard, Tom Roeper & Margaret Speas. 2009. Evidentials in Tibetan: Acquisition, semantics, and cognitive development. *New Directions for Child and Adolescent Development* 2009: 29–47. https://doi.org/10.1002/cd.248.

Winans, Lauren, Nina Hyams, Jessica Rett & Laura Kalin. 2015. Children's comprehension of syntactically-encoded evidentiality. In Thuy Bui & Deniz Özyildiz (eds.), *Proceedings of the 45th Annual Meeting of the North East Linguistic Society*.