

Evidentiality vs. Certainty: Do Children Trust Their Minds More Than Their Eyes?

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1. Introduction¹

Many languages in the world have specific evidential markers, while English appears to mark evidentiality less explicitly. Cross-linguistic work on evidentials suggests that evidential markers are almost indistinguishable from certainty markers in some languages (Faller 2002, Garrett 2002, Speas 2007).

One can then ask how children acquire the distinction. Is it a reflection of innate biases? Does it require maturation of the capacity to assume different perspectives and points of view? The distinction appears to be a prerequisite for the attribution of False Belief which requires evidence to determine that a belief is False.

An important dimension for such a discussion is the question: do children distinguish between certainty and evidentiality where it is explicit in the language? If we consider the tradition in psychology that attributes egocentrism to children, then one consequence is that they do not see a difference between internally generated opinions and real external evidence. Our language in fact supports such confusion in certain ways. We allow ourselves not only to derive certainty from evidence, but allow our terminology to make that extension. Thus “it looks like it will rain” and “it will probably rain” are taken to mean the same thing. In fact, we might even say, hearing sounds from a neighbor, “it looks like they are having a party,” when in fact no visual evidence is available (it should really be “sounds like”).

However, in contexts where probability and appearance are set against each other, then ‘looks like’ assumes its original compositional reading, which is, essentially, ‘something gives visual evidence for’ and therefore should be linked primarily to what is apparent even if it is improbable. ‘Probably’ is inappropriate where our real world knowledge indicates that something is in fact improbable, but ‘looks like’ can be used in improbable situations. We could say “this man looks like a woman, but he is not,” but we could not say *“this man is probably a woman, but he is not.”

‘Looks like’ often delivers some degree of certainty to the user, and therefore it is not very surprising that it is extended, a bit metaphorically, to a use where only inference is present and the term reflects a degree of certainty, especially where expletives are involved: “it looks like Obama is the winner” could be said before votes are counted.

When do children discriminate the difference between evidentials and certainty markers? We decided to examine this question from the perspective of the two expressions ‘looks like’ and ‘probably’ in English. We will argue that there is an important asymmetry here:

Evidentials carry a pragmatic inference about a speaker’s degree of certainty, but certainty markers do not imply anything about the source of evidence (cf. Davis, Potts & Speas 2007).

The prediction is then that we might use ‘looks like’ to capture what seems internally ‘probable’ (even if we do not have visual evidence), but we would not use ‘probably’ to refer to visual information as source of evidence. While evidence can naturally produce some degree of certainty, a degree of certainty cannot produce nor should be taken as a form of evidence. This is an elementary distinction and therefore plausibly innate.

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However, in conversation the connection is easily made. One can imagine someone saying “John was sure the book was on this shelf, so it must be on this shelf,” taking John’s certainty as evidence that the book must be there. The child might be excused if she believed that there was no difference between evidentials and certainty markers, so a real question exists: how and when do children distinguish between certainty and evidentiality?

In order to tease these apart, we must find situations where evidence and certainty actually go in opposite directions, where evidence suggests something that we are definitely certain is impossible. One way to do so is to make use of the fact that ‘looks like’ has a reading where it refers precisely to appearances alone. Can children understand where ‘looks like’ functions as an evidential—not meaning ‘probably’ but meaning ‘shows evidence of.’ That meaning emerges sharply exactly where the ‘probably’ reading is not present. We developed scenarios to fit this scheme.

Previous acquisition work has found asymmetries in children’s understanding of source of evidence and speaker attitude (Fitneva 2001). Spontaneous data suggest that it is plausible that very young children do make this distinction, although there is evidence in various dialects that (a) evidentials can be converted into certainty markers and (b) evidentials imply a degree of certainty to speakers in many occasions. In our comprehension experiment, the use of anti-pragmatic environments—where visual evidence and world knowledge lead to different interpretations—turned out to be particularly useful in separating out the implication of certainty and evidentiality. In this study, we investigated the following two questions in detail.

- (1) Do children produce evidential markers like ‘looks like’ and certainty markers like ‘probably’?
- (2) Do children correctly understand the semantics of ‘looks like’ and ‘probably’ and distinguish the two?

2. Spontaneous data

We analyzed spontaneous data of seven children between 1;6 and 5;0 from CHILDES:

Child	Reference	Age
Eve	Brown (1973)	1;6-2;3
Naomi	Sachs (1983)	1;6-4;9
Peter	Bloom (1970)	1;9-3;1
Nina	Suppes (1973)	1;11-3;3
Sarah	Brown (1973)	2;3-5;1
Adam	Brown (1973)	2;3-4;10
Abe	Kuczaj (1976)	2;4-5;0

We found that children clearly used ‘looks like’ evidentially with NP complements before age 3:

- (3) Eve: this looks like a lollipop [= pencil] .
 Peter: yeah <this with> [/] this look like a fish .
 Peter: yeah # these are # <no like> [/] this looks like a fish's mouth .

Sentential cases, including raised subjects, come in at age 4-5:

- (4) Naomi: it looks like it's a bite .
 Sarah: xxx look like it's gon close [?] ?
 Adam: it looks like it not going to stop # right ?
 Adam: looks like someone's dead # doesn't it ?
 Adam: dat clay doesn't look like it's sticky # but it is [!] sticky to me .
 Adam: it looks like it's broken .
 Adam: those looks like we have three children to go in dose beds .
 Adam: dey look like dey marching .

Moreover, children use ‘probably’ like a certainty marker at age 4-5:

- (5) Peter: probably we got to use one of these # to work it .
 Adam: you probably # be cowboy .
 Adam: dat probably is my train .

These data suggest that children use and distinguish evidential markers and certainty markers from an early age. In order to investigate whether children correctly understand the semantics of ‘looks like’ and ‘probably’ and distinguish the two we conducted a controlled comprehension experiment.

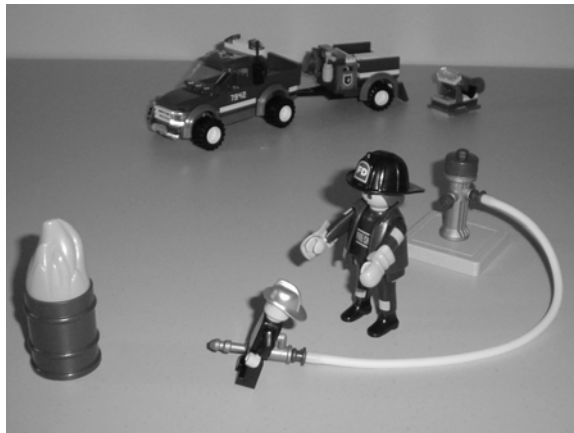
3. Experimental method

3.1. Materials

We conducted a comprehension experiment with pictures accompanied by stories and questions about them. The pictures and stories contained contexts in which ‘looks like’ and ‘probably’ would lead to opposite answers. Each story was followed by one question with either one of the two expressions. There was a total of eight items per subject: four questions with ‘looks like’ and four questions with ‘probably.’

- (6) Sample story:

Here’s the fire chief. Today he brought his son Johnny with him on the fire truck to the open house in the fire department. They even have a fire there. Johnny wants to help his dad put out the fire. But look at him! He’s so small he can’t even hold the fire hose!



- a. Who looks like he’s gonna put out the fire?
 b. Who’s probably gonna put out the fire?

We expected participants to say that Johnny ‘looks like’ he’s gonna put out the fire, but his dad, the fire chief, is ‘probably’ gonna put out the fire, as by inference from world knowledge the fire chief is more likely to do so.

3.2. Subjects

21 children participated in the study—a younger group of four-year olds (3;8-4;9, N=12, M=4;1) and an older group of five-year olds (5;0-5;7, N=9, M=5;2)—as well as a control group of 27 adults. The children were tested in preschools in Amherst, Massachusetts, while UMass undergraduates participated as controls.

3.3. Hypotheses

There are three possible scenarios:

- (7) Hypothesis 1:
Children do not differentiate evidentiality from certainty in the earliest stages.
- (8) Hypothesis 2:
Evidentiality appears first. Children should interpret ‘probably’ as ‘looks like’ (they should always choose visual evidence—the child in the picture).
- (9) Hypothesis 3:
Degree of certainty appears first. Children should interpret ‘looks like’ as ‘probably’ (they should always choose the inference—the adult).

We predict that the experimental data will reflect the patterns of the spontaneous data, i.e. an instant differentiation between evidentiality and certainty.

4. Results

4.1. Overall results

Children clearly distinguish between ‘looks like’ and ‘probably,’ just as the adults do. Both children and adults associate ‘looks like’ with visual information more frequently than ‘probably’ (4-year olds: 44% vs. 27%, 5-year olds: 50% vs. 25%), while adults associate ‘looks like’ with visual evidence 77% of the time and ‘probably’ only 6% of the time. Both children and adults are more likely to make inferences from world knowledge about who is more likely to do what in the case of ‘probably’ than in the case of ‘looks like’ (4-year olds: 73% vs. 50%, 5-year olds: 75% vs. 44%, and adults: 94% vs. 23%). For example, even though there is visual evidence that little Johnny in the sample item above might put out the fire, children know that fire fighters rather than little kids usually put out fires, and therefore the fire chief in the sample item is more likely to do so. Using their world knowledge, children (and adults) make inferences about the degree of certainty in the case of probably. Thus there is a clear tendency for both children and adults to associate ‘probably’ with degree of certainty, while children differ from adults in their understanding of ‘looks like.’

The distribution of responses for ‘looks like’ is given in table 1 and figure 1 below.

Table 1. Responses for ‘looks like’

‘looks like’	visual evidence	inferential evidence	non-informative
4-year olds (n=12)	18 (44%)	16 (50%)	2 (6%)
5-year olds (n=9)	21 (50%)	24 (44%)	3 (6%)
Adults (n=27)	83 (77%)	25 (23%)	0 (0%)

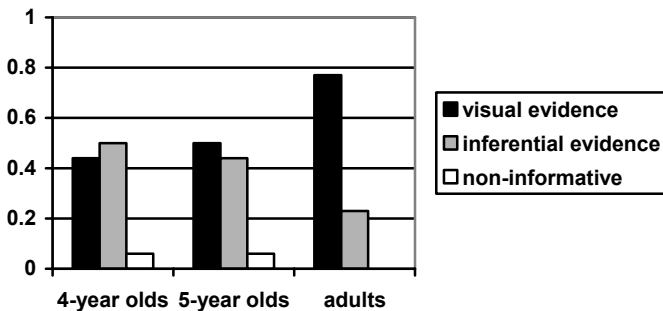


Figure 1. Responses for ‘looks like’

The distribution of responses for ‘probably’ is shown in table 2 and figure 2 below.

Table 2. Responses for ‘probably’

‘probably’	visual evidence	inferential evidence	non-informative
4-year olds (n=12)	9 (27%)	27 (73%)	0 (0%)
5-year olds (n=9)	13 (25%)	35 (75%)	0 (0%)
Adults (n=27)	7 (6%)	101 (94%)	0 (0%)

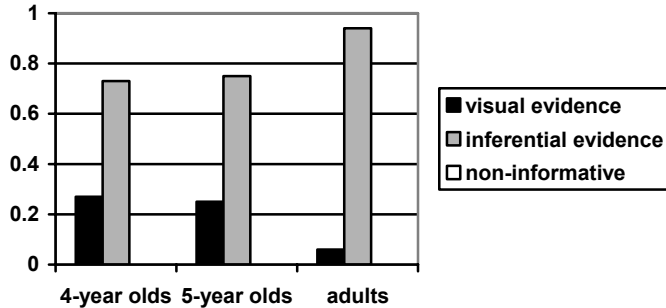


Figure 2. Responses for ‘probably’

4.2. Individual results

For children ‘looks like’ can equally well mean ‘looks like’ or ‘probably,’ whereas adults interpret ‘looks like’ as ‘probably’ in only 23% of cases. Adults never take ‘probably’ to mean ‘looks like’—they never base their interpretation of ‘probably’ exclusively on visual evidence,² whereas children do in about 25% of cases. Even though adults never interpret ‘probably’ as ‘looks like,’ some interpret ‘looks like’ to mean ‘probably.’ Table 3 and figure 3 show how these patterns are distributed among the children and the adults.

Table 3. Number of subjects per age group according to response pattern

age group	clear distinction (visual evidence for ‘looks like’ & inferential evidence for ‘probably’)	both visual and inferential evidence for ‘looks like,’ but only inferential evidence for ‘probably’	exclusively (and almost exclusively) inferential evidence for both ‘looks like’ & ‘probably’	exclusively visual evidence for both ‘looks like’ & ‘probably’	no distinction between ‘looks like’ and ‘probably’
4-year olds	2 (17%)	2 (17%)	3 (25%)	0	5 (42%)
5-year olds	3 (33%)	1 (11%)	2 (22%)	1 (11%)	2 (22%)
Adults	14 (52%)	8 (30%)	4 (15%)	0	1 (4%)

² The 7 cases (6%) in which adults interpreted ‘probably’ as ‘looks like’ can be explained as an artifact of the experimental design: it was always the first item. Upon noticing the contrast between ‘probably’ in the first experimental item and ‘looks like’ in the second, they consistently associated ‘looks like’ with visual evidence and ‘probably’ with likelihood based on inference from world knowledge.

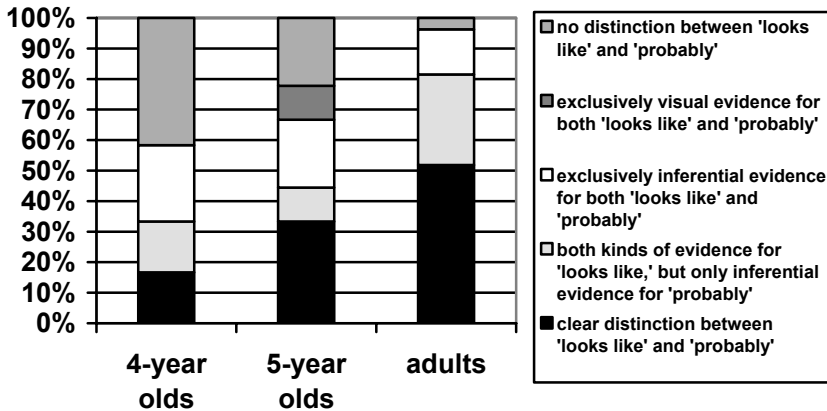


Figure 3. Number of subjects per age group according to response pattern

Our participants divide into those who show a clear distinction between ‘looks like’ and ‘probably’ and a small number, mostly the younger children, who do not. Among those who do, adults are the strongest, consistently using ‘looks like’ for evidence and ‘probably’ for inference (52 % of the adults, 33% of the 5-year olds, and 17% of the 4-year olds). In fact, they actually say things that explicitly contrast ‘looks like’ and ‘probably.’ The following adult responses illustrate this point:

- (10) Experimenter: Who looks like she’s gonna bake a cake?
 Adult: The baby (though Minnie will probably be the one to actually do it.) She's holding the pan.
- (11) Johnny looks like he's going to put out the fire in the picture but because he can't life the hose, his dad will probably end up doing it.
- (12) The baby looks like she's going to bake but Miney probably will since she's going to for Mickey.
- (13) It looks like Billy is going to drive because he's already sitting there but in actuality the doctor probably will.
- (14) Johnny looks like he's going to put out the fire, but his dad probably will.
- (15) The little kid looks like he's going to drive, but probably not.

Example (16) further shows a clear distinction between evidentiality and certainty, with ‘looks like’ referring to the source of evidence (visual) as opposed to the degree of certainty:

- (16) Because she [the baby] is holding the pots. She looks like she would be the one baking but Minnie would most likely bake.

Further support for ‘looks like’ as a marker of visual evidence comes from the paraphrases some of the adults used, for example ‘look as if,’ ‘looks ready to,’ ‘appears to be ready,’ and ‘looks as though’:

- (17) Their facial expressions make them both look as if they're ready to blow.
- (18) He looks ready to blow out the candles.
- (19) He appears to be ready to put out the fire.

(20) He looks as though he is ready to drive the ambulance.

The following examples, on the other hand, show that some adults and children allow inferential evidence for ‘looks like’ and thus use it like ‘probably’ or respond to ‘looks like’ by referring to plausibility or the degree of certainty rather than to visual evidence:

(21)E: Who looks like he’s gonna put out the fire?

A: Papa fireman will probably help his son do it.

(22)E: Who looks like she’s gonna bake a cake?

A: Minnie is about to bake a cake for Mickey. The baby [who looks like it] is not about to cook--she is only playing.

(23)E: Who looks like he’s gonna put out the fire?

A: In this picture since the boy [who looks like it] is so small the father might have to put out the fire."

However, adults and children who distinguish between ‘looks like’ and ‘probably’ never use ‘probably’ as an evidential but only as a certainty marker³:

(24)E: Who’s probably gonna lift the books?

A: Superman.

E: Why?

A: Because the baby can't even lift one book and Superman is very strong so he's probably going to end up lifting them.

(25) Superman is probably going to lift the books because the baby isn't able to.

(26) The cowboy is probably going to ride the horse because the firefighter is probably going to fall trying to ride the horse.

(27) Superman is probably going to lift the books because baby is too small.

There is another group of mostly young children who fail to show any distinction between ‘looks like’ and ‘probably’ (5 four-year olds (42%), 2 five-year olds (22%), and 1 adult). They allow ‘looks like’ to refer to both visual evidence and certainty –in line with some adults—but they also allow ‘probably’ to refer to both—unlike the adults. The following child responses illustrate this point:

(28) Experimenter: Who’s probably gonna steal the treasure?

Child (SF, 4;7): The cowboy.

Experimenter: Why?

Child: Looks like him.

(29) Experimenter: Who looks like he’s gonna lift the books?

Child (SM, 3;10): Superman.

Experimenter: Why?

Child: Because he’s strong.

(30) Experimenter: Who’s probably gonna drive the ambulance?

Child (RO, 5;2): The doctor.

Experimenter: Why?

Child: He looks like he's gonna drive the ambulance.

³ There is one child who exclusively chooses visual evidence for both ‘looks like’ and ‘probably’ and is therefore an apparent counter-example. However, this child failed to make a distinction between the two expressions.

Are they counter-evidence to our claims? Does it reveal that perhaps children do begin with no distinction? We argue that they continue to make the distinction, but allow ‘probably’ to apply to what we adults consider an improbable situation by adding fantasy to what they see, so that in fact it could be probable. That is, in a fantasy world the child might indeed put out a fire or drive an ambulance. In fact they say things that support the idea that they consider the ‘looks like’ situation to be remotely plausible:

- (31) Experimenter: Who’s probably gonna put out the fire?
 Child (WT, 5;3): Johnny.
 Experimenter: Why?
 Child: Because he really wants to put out the fire.
- (32) Experimenter: Who’s probably gonna drive the ambulance?
 Child (WT, 5;3): Billy.
 Experimenter: Why?
 Child: Because he's already inside.

5. Discussion and conclusion

As we hypothesized, if children did not distinguish evidentiality and certainty, we would predict confusion in either direction: evidentiality as certainty and certainty as evidentiality. However, the semantic component of UG is not unbiased—it contains an asymmetry in the relationship between evidentiality and certainty. Davis, Potts & Speas (2007) have argued that sentences with evidential markers carry a pragmatic inference about the speaker’s degree of certainty, but never the reverse. Our data support this analysis.

How does evidentiality relate to other challenges a child faces in language acquisition? One area it is pertinent for is False Belief reasoning (de Villiers 2007). Our results show that a crucial distinction that is needed in order to assign a False Belief is present at an early age: the recognition of external evidence for a proposition. This is not the only prerequisite for False Belief attribution. One must also be able to distinguish Points of View in order to assign them.

In order to master False Belief tasks, children need to be able to distinguish between (a) the truth of a proposition, (b) evidentiality, and (c) degree of certainty. However, distinguishing them does not automatically lead to mastery of False Belief contexts. In our study, children exhibit these distinctions at an age that is roughly prior to the age at which they reliably master False Belief contexts.

Moreover, Ozturk & Papafragou (2007) argue that children recognize visual evidence more easily than inferential evidence. Our results show that they are equally good at both. In fact, children show a greater inclination to trust their minds and use inferential evidence than visual evidence.

Our primary conclusions are: first, children by the age of four are able to distinguish a certainty marker from an evidential. This implies that important dimensions of cognitive awareness are present for the kind of reasoning needed in False Belief contexts. Second, our results support a basic distinction between the directions of mental inference: we derive a sense of certainty from evidence, but we cannot convert our sense of certainty into a form of evidence. This basic distinction is evident early in children. It remains possible that the distinction is latent for very young children and those who use “probably” and “looks like” indiscriminately, but our evidence suggests that even the sometimes obscure uses of “looks like” do not prevent children from grasping that the term refers to external evidence and not internal expectations.

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