

de Villiers, J., Garfield, J., Gernet-Girard, H., Roeper, T., & Speas, M. (2009). Evidentials in Tibetan: Acquisition, semantics, and cognitive development. In S. A. Fitneva & T. Matsui (Eds.), *Evidentiality: A window into language and cognitive development, New Directions for Child and Adolescent Development*, 125, 29–47. San Francisco: Jossey-Bass.

3

Evidentials in Tibetan: Acquisition, Semantics, and Cognitive Development*

Jill de Villiers, Jay Garfield, Harper Gernet-Girard,
Tom Roeper, Margaret Speas

Abstract

We describe the nature of the evidential system in Tibetan and consider the challenges that any evidential system presents to language acquisition. We present data from Tibetan-speaking children that shed light on their understanding of the syntactic and semantic properties of evidentials, and their competence in the point-of-view shift required for the use of evidentials in questions. We then examine connections between the mastery of indirect evidentials and children's inferential competence. © Wiley Periodicals, Inc.

*Thanks to Ed Garrett, Dr. Tsering Topgyal, Namgyal Norbu, and Megan Kravitz for invaluable assistance in the design and conduct of experiments, transcription and analysis of data, and for theoretical contributions. Thanks also to Caroline Sluyter and Elyse Waite for research and editorial assistance with this paper. This research was conducted with support from the National Science Foundation, grant # HSD 0527509.



In a language with evidentials, mastery of the evidential system, like mastery of theory of mind, requires a child to acquire knowledge of hidden matters. To pass nonlinguistic theory of mind tests, a child must know something about the mental states of others. To use and to comprehend linguistic markers of evidence type, the child must understand not only the cognitive states of speakers but also the connections between these states and events outside the discourse situation. It is not at all obvious how a child learns how to use evidentials properly. Previous studies of the acquisition of evidentials in Turkish, Korean, and Quechua (Aksu-Koç, 1988; Choi & Aksu-Koç, 1999; Courtney, 2008; Papafragou, Li, Choi, & Han, 2007) have shown that children begin to use these morphemes quite early (around age two) but do not master their full meanings until some years later.

We have been studying the acquisition of the evidential morphemes in Tibetan. Our data suggest that children go through several stages of understanding evidentiality, reflecting both the acquisition of the ability to make and comprehend inferences and the ability to distinguish between how certain a speaker is and how a speaker knows what she knows.

In this chapter, we first explain the distinction between evidentials and semantically similar categories like attitude predicates, adverbs, and epistemic modals. We then describe the evidential system in Tibetan and consider the conceptual and linguistic capacities necessary for the mastery of evidentials. We present and discuss the experiments we conducted with Tibetan-speaking children (and English-speaking children, for comparison), to explore the mastery of these various component abilities. We conclude with a discussion of the implications of our findings for our understanding of the relationship between the acquisition of the linguistic forms and acquisition of the related concepts.

Evidential Morphemes and Sources of Knowledge

All languages have words to represent the source of one's evidence, but about one-quarter of the world's languages have a specialized grammatical system for encoding what type of evidence the speaker has for her statement (Aikhenvald, 2004). (By *specialized grammatical system*, we mean a grammatical category, or "gram," as defined by Bybee et al., 1975, p. 2: "Closed-class elements whose class membership is determined by some unique grammatical behavior, such as position of occurrence, co-occurrence restrictions or other distinctive interactions with other grammatical elements.")

Propositional attitude predicates introduce embedded sentences that can express epistemic attitudes ("I think that . . .," "You know that . . .") and sometimes convey information about the nature of the evidence for a statement. ("I infer that . . .," "He saw that . . ."). However, evidentials differ from such attitude predicates in three ways. First, an evidential does not

take a subject of its own, and it must be oriented to the speaker. Attitude predicates are always oriented to the subject; they are oriented to the speaker only if the subject happens to be first person. (However, in some languages, including Tibetan, as we shall see, evidentials can take the point of view of the addressee in questions.)

Second, evidentials convey how the speaker's epistemic state was achieved rather than the nature of the epistemic state itself (such as knowledge versus belief), and hence, unlike attitude predicates, they do not qualify the speaker's commitment to the truth of the assertion. This is true even of hearsay evidentials. For example, in a context where it is understood that the hearsay is from an extremely reliable source, such as wisdom handed down by elders, a sentence with a hearsay evidential can convey information that the speaker firmly believes.

Third, unlike attitude predicates, evidentials generally occur only in main clauses and do not introduce a syntactically subordinate clause. Thus, although they may convey the same information as "I infer that," "I saw that," or "They say that," evidentials do not involve complex recursive syntactic structures. That is, they do not introduce subordinate sentential clauses.

Adverbs or adverbial phrases like *evidently*, *reportedly*, and *based on what is known* can also convey information about the evidential basis for a statement, but evidentials differ from adverbs in the inventory of possible meanings. Evidential systems rarely encode more than four types of evidence, and the categories of evidence expressed by these morphemes are remarkably similar across languages that contain evidentials (Willett, 1988; Aikhenvald, 2004). Evidentials generally encode a distinction between direct evidence, such as that gained from witnessing the event, and indirect evidence that triggers an inference. Some languages also distinguish between indirect evidence and hearsay or between direct visual evidence and direct nonvisual evidence.

These categories constitute a very small subset of the conceivable range of culturally salient information sources (Speas, 2004). No language has an evidential for divine revelation, process of elimination, experience reported by loved one, legal edict, parental advice, heartfelt intuition, trial and error, or teachings of a religious authority, for example. Thus, evidentials differ from adverbs in that they represent abstract values within a closed-class system rather than lexically specific information about the source of evidence.

The kind of meaning conveyed by an evidential is also different from that conveyed by epistemic modals. Epistemic modals express how likely the information is to be true or how certain the speaker is, and evidentials convey the nature of the evidence that the speaker has (Oswalt, 1986; de Haan, 1999; Hardman, 1986; DeLancey, 1986; Lazard, 2001; Plungian, 2001; Aikhenvald, 2004). As we noted above, evidentials are used to make unqualified assertions. As Rooryck (2001a, 2001b) pointed out, we can often infer

the degree of certainty from the type of evidence, and vice versa. For example, if someone claims that something “must” be the case, we can infer that he or she has reasonably reliable evidence for it. Conversely, if someone makes it clear that a claim is made based on her having witnessed the actual event, we can infer that she is quite certain that the claim is true. In short, epistemic modals express a speaker’s judgment about probability or necessity, while evidentials express the type of evidence the speaker has for her claim and may therefore warrant a judgment by the hearer about the probability of the assertion being true. As Fitneva (2001) has shown, evidentials differ markedly from all three of these devices—attitude predicates, adverbs, and modal auxiliaries—despite the fact that they may serve some of the same semantic and pragmatic roles these devices play in languages that lack an evidential system such as English.

The Tibetan Evidential System

Tibetan is a head-final language in which the main verb of most sentences is a form of the copula or verb of existence. Tibetan evidentials are distinctive forms of the copula, and so evidentiality is a feature of virtually every Tibetan assertion or question. In Tibetan, the evidentials can be used in present and past tense. Most descriptions (Garrett, 2001; Denwood, 1999) of the Tibetan evidential system distinguish three categories of evidentials: direct, ego, and indirect. We find it useful to distinguish a fourth category, neutral, which is used when a speaker is noncommittal about the kind of evidence for the assertion. Direct evidentials are reserved for cases in which the speaker has directly witnessed a situation with her own eyes and also to report internal states. The direct evidentials in Tibetan are *‘dug* and *song*, the latter of which is a direct evidential for past tense. So when a speaker says *rtsi rtsi pha gir ‘dug* (“There is a mouse over there”), she is asserting that there is a mouse over there, and indicating by the use of *‘dug* that she sees it.

Indirect evidentials are used in cases in which the speaker does not directly witness a situation about which she is making a claim but has some kind of indirect evidence for the assertion. The indirect evidentials are *yod sa red* and *yod kyi red*. Garrett (2001) does not distinguish between these two forms, which he classifies as versions of *yod red*. *yod sa red* is used when one has direct experience of specific evidence for the truth of the utterance but does not directly witness the situation described. For instance, a speaker could say *rtsi rtsi pha gir yod sa red* (“There is a mouse over there”) when she directly sees mouse footprints in the dust but does not see the mouse. Note that when she says this, she is asserting that there is a mouse over there, just as much as she would be if she used *‘dug*, but she is revealing that although her evidence for this assertion is perceptual, she does not see the mouse itself.

yod kyi red is an indirect evidential used when the information is nonperceptible, for instance hearsay, general knowledge, or inference from

general facts. So if a speaker says *rtsi rtsi pha gir yod kyi red*, she is asserting that a mouse is over there but also indicating that she infers this. Perhaps the mouse is always there at this time every day, or perhaps this is the place where there are always mice, or maybe some reliable source told her that a mouse is there.

Ego evidentials are used when a speaker is reporting a state of her own mind or body to which she has privileged access, that is, accessible to her alone. Ego evidentials are used, for example, to talk about hunger or emotional states. The ego evidential morphemes in Tibetan are *yin* and *yod*, and, as noted above, sometimes *'dug*.

In addition to the explicit direct, indirect, and ego evidential categories, Tibetan includes a neutral evidential category (*red*, *yod red*). These verb forms give no information about the kind of evidence on which the speaker is relying, but are infelicitous where the direct or ego evidential would be felicitous, and thus less committal with regard to the precise nature of the indirect evidence.

In our studies, we consider three properties of Tibetan evidentials, all of which bear on the distinction between the evidential system and a system for representing epistemic modality. First, we consider the relation between Tibetan evidentials and negation; second, the failure of evidentials, unlike epistemic modals, to weaken the force of assertions; and third, the way Tibetan evidentials behave in question-answer dialogues.

Epistemic modals, unlike evidentials, contribute directly to the truth conditions of the propositions to which they attach (Faller, 2006). Attaching an epistemic modal to a sentence might change the truth value from false to true. Consider the game Clue, in which the goal is to be the first to determine which character, weapon, and room were involved in a crime. Suppose a player has eliminated all suspects except Mr. Green and Miss Scarlet (unbeknownst to him, Miss Scarlet is in fact the murderer). In this context, "Mr. Green *might be* the murderer" is true, whereas "Mr. Green *is* the murderer" is false. The epistemic modal hence contributes to the truth conditions of the sentence. Tibetan evidentials, however, do not contribute to the truth conditions of the sentences in which they occur. Sentences that differ only in respect of the evidentials they contain have exactly the same truth conditions, despite the fact that the conditions under which they would felicitously be used differ. For example, attaching different evidentials to the proposition "Mr. Green is the murderer,"

Mr. Green mi gsod mkhan *'dug*
Mr. Green mi gso mkhan *yod kyi red*

does not change the truth of the propositions: if Mr. Green is not the murderer, both claims are false, and if Mr. Green is the murderer, both are true.

Sentences with negation that takes scope over the whole sentence demonstrate this difference between evidentials and epistemic modals.

If you say, “It is not true that Dr. Channing must be the murderer,” you can be denying either that it is necessarily the case that Dr. Channing is the murderer or denying that Dr. Channing is the murderer. In other words, there is a scope ambiguity between the negation and the modal. Thus, when one denies a sentence governed by an epistemic modal, one may be denying either the modalized proposition expressed by the sentence with modal or the nonmodalized sentence governed by the modal (von Stechow & Iatridou, 2005). This ambiguity can also be seen when a sentence with a modal is simply denied. For example, the chief of police may tell the detective, “Doctor Channing *must* be the murderer.” If the detective responds with “no,” she may be voicing her belief that Doctor Channing is not the murderer or she may simply be denying that he must be.

When a sentence containing an evidential is denied, the denial can only be a denial of the proposition expressed by the sentence, and not the felicity of the evidential used (Faller, 2006). For instance, suppose I were to assert in Tibetan that Dr. Channing is the murderer, using *‘dug*, the evidential of direct perception. Were the detective to deny my assertion, she could only be denying that Dr. Channing is the murderer. She could not be asserting that while he might be the murderer, I do not have the evidence to warrant the use of *‘dug*. This is the case with respect to all evidentials in Tibetan.

All epistemic modals, even the strongest (such as *must*), weaken the strength of the propositions they govern (Davis, Potts, & Speas, 2007). Even, “You must be right,” implies more uncertainty than the corresponding assertion with no modal: “You are right.” The speaker’s choice to use a modal always indicates some uncertainty. Tibetan evidentials, on the contrary, do not weaken the force of the assertions of the sentences in which they occur. In fact, since evidentials are mandatory in Tibetan, if they shared this property with epistemic modals, a speaker of this language could never express complete confidence. There is another reason for thinking that Tibetan evidentials are independent of the modal system: sentences can contain both evidentials and epistemic modals, and indeed indirect evidentials can co-occur with very strong epistemic modals.

When an evidential is used in a question in Tibetan, there is a point-of-view shift from speaker to listener. When asking a question, one uses the evidential that one expects the interlocutor to use in her reply, that is, the evidential one presumes to be felicitous given the interlocutor’s epistemic state. Suppose I believe that you would be able to see directly whether a mouse is over there, and I want to know from you whether there is. I would then use a direct evidential in my question, *pha gir rtsi rtsi dug gas?* (“Is there a mouse over there?”). The fact that I use *‘dug* in my question reflects my anticipation of the felicity of *‘dug* in your answer. If I believed that you would be able to see the mouse’s footprints but not the mouse, I would have used *yod sa red*.

When a questioner uses an evidential that does not correspond to the listener's type of evidence, the listener must respond by using the correct evidential in reply. Unlike epistemic modals, the failure to replace an infelicitous evidential in an answer would constitute a grammatical error, not just a pragmatic failure to provide complete information. When I ask you in English, on the telephone, "Might Susan be home?" and you, sitting across the table from her, simply answer, "Yes, she might be," you have certainly failed the Gricean conversational maxim to provide maximum information, but you have not spoken ungrammatically. But if in Tibetan, in a similar circumstance, I ask you, *bkra shis nang la yod sa red pas* ("Is Tashi home?" using the indirect evidential presupposing direct knowledge of specific evidence), and you answer, *nang la yod sa red* ("She is in," using the same infelicitous evidential), your assertion would be judged by Tibetan speakers to be completely unacceptable.

Evidentials: The Pieces of the Acquisition Puzzle

Evidentials mark kinds of evidence, and their meaning must be learned by observing the relationship between their use and the kind of evidence their users take themselves to have for what they are saying. Take the case of the child listener who hears the people around him using the very common Tibetan direct perception evidential, *'dug*. In many cases, this might be uttered when both the speaker and the hearer can see the evidence for the statement. In other situations, when the basis of the assertion was not visible directly to either the speaker or the hearer, the child would not hear *'dug* used by a speaker. But *'dug* does not carry the information that the subject under discussion is currently visible to both speaker and hearer, but rather that the speaker has (perhaps in the past) direct perceptual evidence for what she says. As a result sometimes the speaker uses *'dug* when the subject matter of the sentence is not perceptually available to the child, or fails to use *'dug* when the evidence is in plain sight to the child but not to the speaker. To achieve mastery, the child must attend to what a speaker can see or could have seen. This information is what is pertinent to the meaning of *'dug*, and not the child's own perceptual access, or speaker certainty or uncertainty.

Children can monitor what another person has or has not seen before they demonstrate mature theory of mind (Wellman & Liu, 2004). One might therefore expect that children would master the felicity conditions for *'dug* around the time they can distinguish between who has or has not seen, that is, at approximately three to four years of age. But this would be hasty. Since when a speaker uses *'dug*, she or he will typically be very certain of the truth of the assertion, what may be more salient for the child may not be information regarding the perceptual evidence available to the speaker but the certainty of the speaker's claims. Therefore, the evidence

available to the child in the acquisition scenario described is at least equally good evidence for the child that the evidential encodes speaker certainty. The child therefore might be expected to conclude that *'dug* means something prima facie like *obviously* or *for sure*, which would have nothing to do with source of evidence.

Fixing *'dug* as a direct evidential requires establishing it as part of a system of evidentials encoding source information and contrasting its meaning with that of other evidentials, such as the inferential or indirect evidentials (whose acquisition poses even greater developmental challenges), and this in turn requires that the child represent at least a substantial portion of the evidential system of her native language. Without the contrast between correlative members of the same linguistic system, the correct meaning of the evidential cannot be represented.

How, then, does a child learn this system of evidentials? If the child begins with merely a *'dug*/non-*'dug* contrast, the next step will surely be working out what *yod kyi red* and *yod sa red* mean to the speaker. Having established that the forms are egophoric through scenarios in which only the speaker could have relevant evidence, the child must become a kind of (unconscious) sleuth, trying to work out the conditions under which a speaker feels licensed to use each form. This detective work depends critically on the child's appreciation not only of who can see and who cannot see, but also attention to, say, Gricean maxims of informativeness: If a speaker does not use *'dug*, what kind of evidence must she have used to warrant her claim?

The mastery of inference is relevant here as well, for the indirect evidentials, as opposed to direct and ego evidentials, encode the fact that the statement asserted is inferred, and the distinction between the two indirect evidentials encodes a rather finely grained distinction between two kinds of inference. So to understand and know how to use *yod sa red* and *yod kyi red*, children must understand and reliably report not only the difference between perception and inference, but also the difference between inference to the unseen based on perceptible evidence and inference based on general knowledge. Though little is known about how children develop the capacity to understand others' inferences, it appears from our work that these skills mature much later than theory of mind—perhaps around nine to ten years of age (de Villiers, Garfield, Speas, & Roper, 2006; de Villiers, Garfield, Kalsang, et al., 2008 in revision).

Experimental Evidence

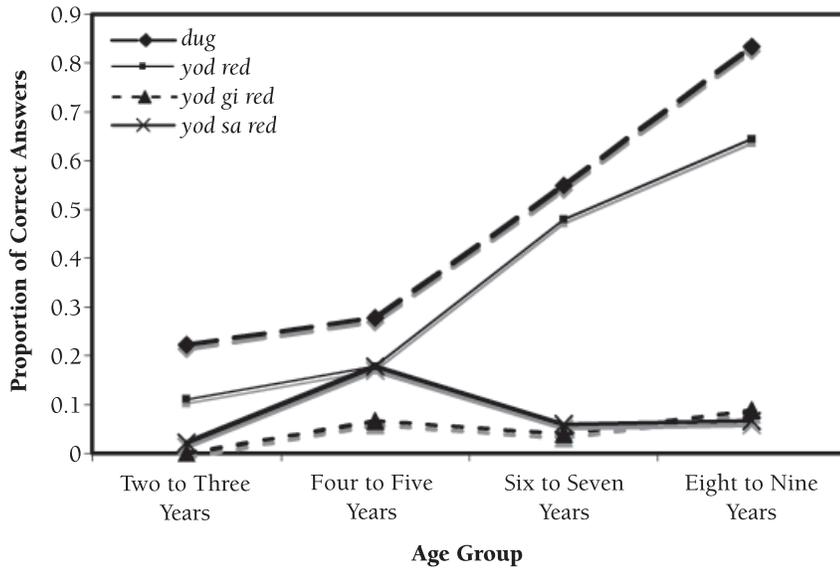
We report results from a series of connected studies regarding the acquisition of Tibetan evidentials. The first set, more exploratory, sought to see how children would respond to evidential use by other speakers in relatively naturalistic circumstances. Then we report a study in which older

children received a set of experimental tasks on deniability, questions, and inference.

In our first set of studies, we presented twenty-five young Tibetan-speaking children (ages two to six) with a variety of situations in which they either had direct visual evidence for the identity of an object or indirect evidence and elicited statements about the identity of these objects. Most children under age five use only *'dug* and the neutral *yod red*. We observed only two spontaneous uses of indirect evidentials in our youngest subjects. Although it is clear that *'dug* was the most frequent early evidential, we could not tell from speech alone what children took it to mean.

We also examined young children's ability to distinguish evidentials receptively, asking whether they could tell from the evidential used by a speaker whether that speaker had direct visual evidence for the statement asserted. The youngest children were at chance on this task. We found that *'dug* and *yod red* produce contrasting judgments long before the indirect forms *yod sa red* and *yod kyi red* are understood. (See Figure 3.1.) Given that in some scenes, the child could not see what the speaker could see, these results must mean that the child takes the evidential use to be egophoric. But these data are equally consistent with two positions: that children are taking *'dug* to mean that the speaker has perceptual evidence or that the speaker is certain.

Figure 3.1 Percentage of Different Tibetan Evidentials Understood, by Age



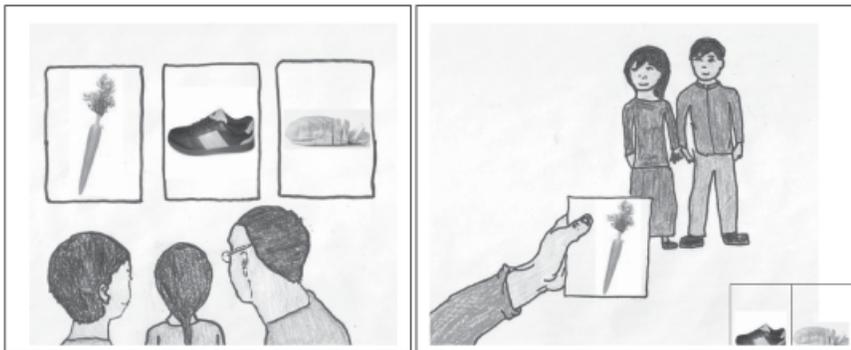
The purpose of our next study was to determine when or whether children distinguished the evidentials from epistemic modals, using tasks on deniability, on question answering, and then a separate inference task. The Tibetan children were recruited from a primary school in Mundgod, India. Twenty-three children ages six to ten were tested on each of the tasks we describe below. English-speaking children of matched ages were drawn from the Springfield, Massachusetts, public schools for comparison (Gernet-Girard, 2008).

Deniability. In a task on deniability, we explored children’s understanding of the fact that denials of sentences governed by evidentials are denials of the assertion made by the sentence, whereas denials of sentences governed by epistemic modals are ambiguous between denials of the asserted content and denials of the appropriateness of the modal. The participants were told about a game in which two children and their dad looked at three cards, each with a different picture. Then Dad picked one card without showing it to the children, and the children were to deduce which card he had picked by asking questions about the picture (Figure 3.2). In each scenario, one of the children asked a question that eliminated one card and left two remaining as possibilities. A set of control questions that do not entail understanding of evidentials or epistemic modals ensured that children had the inference skills that the game requires.

Children were presented with ten test stories of the following form (see Figure 3.2):

Dad, Lucy, and Mike look at three cards—a shoe, a loaf of bread, and a carrot.
 Dad picks a card [the carrot].
 Lucy asks, “Can you eat it?”
 Dad says, “Yes.”

Figure 3.2 Successive Pictures of the Deniability Task



Lucy says, “It must be the carrot/It’s the carrot [with *yod kyi red*].”

Mike says: No.

Question: Is Mike right?

In English either “yes” or “no” is acceptable. An English-speaking Mike could be denying the proposition (*that it’s the carrot*) or the appropriateness of the epistemic modal (that it *must* be). If Mike is denying the appropriateness of the epistemic modal, then he is correct because it is untrue that it *must* be the carrot (bread can be eaten also). In contrast, the correct answer to the above question when asked in Tibetan is “no.” Lucy’s logic is faulty, but Mike’s “no” can only deny her assertion *that it is the carrot*, and cannot deny the appropriateness of the evidential. In Tibetan, Mike (actually his equivalent in Tibetan, Tashi) is mistaken. In an additional set of questions, the evidential *‘dug*, was used inappropriately because Lucy (the speaker) was blindfolded. However, again, the only available interpretation in adult Tibetan is that to deny the assertion is to deny the proposition that it asserts, not the felicity of the evidential. Adults performed at 100 percent accuracy in both tests. If Tibetan children treat evidentials as epistemic modals, then their answers should match those of English-speaking children; if they represent them as evidentials, they should refuse to accept denials in cases where the asserted content is true.

Tibetan-speaking children of all age groups were fairly successful with this task, performing as we anticipated for both *‘dug* and *yod kyi red* questions. The percentage of correct responses (responses in which the child judges the negation to be a denial of the sentence containing the evidential) had a mean of 97 percent for the *‘dug* category and 89 percent for the *yod kyi red* category. Even six year olds succeeded. This confirms that Tibetan evidentials, unlike epistemic modals, cannot be directly negated and that even young children represent this property.

Responses from English-speaking adults and children were varied, as we had predicted, between those who interpreted the “no” to be negating the proposition expressed by the sentence and those who interpreted it as negating only the felicity of the epistemic modal. The overall rate of taking denial to be the rejection of the appropriateness of the epistemic modal was 20 percent across the children and 41 percent across the adults. This confirms that in English, both children and adults can take the negative to deny the felicity of the epistemic modal.

The data suggest that in English, it is more difficult to deny the modalized than the unmodalized proposition. Denying the modalized proposition engages more complex inference: Does it have to be the carrot, given the clue? One might ask whether Tibetan children are just worse at inference than American children, and therefore only deny the simple proposition, not noticing that the modalized proposition has different truth conditions. We will show using another task that this interpretation cannot be sustained

and indeed that, if anything, our Tibetan participants are better at inference than their American counterparts.

Questions and Discourse Conventions. In Tibetan the evidential used in a question anticipates the epistemic state of the listener. This fact allows us to ask in another task whether Tibetan children will exploit their understanding of epistemic situations to correct an infelicitous evidential. To test this, children were told about rules in a family's life:

Every day, Dad rides his bicycle to work and home again. He leaves his bicycle on the porch when he goes inside the house. [The experimenter shows a picture describing the situation, which shows a bicycle on the front porch of a house. See Figure 3.3.] Timmy is in the front yard when Ashley calls him on the cell phone.

Then in the English version, Ashley asks,

“Is Dad at home?”

In the Tibetan version, Ashley asks this question using an evidential, for instance, *‘dug*. Finally, the experimenter asks the child:

What will Timmy say?

In English, even though Ashley's question contains no modal and therefore assumes that Timmy is certain about Dad's whereabouts, Timmy is perfectly licensed to respond with “yes.” He could also respond by saying, “Well, I can't see him, but his bicycle is here,” but he does not need to respond in this fashion.

Figure 3.3 Sample Picture from the Questions Task



In Tibetan, however, the question contains the evidential *'dug*. The questioner assumes that the hearer can see Dad. Because the hearer cannot see Dad, he must respond with a different evidential, thereby correcting her misconception. However, if Tibetan children are at a stage where they represent evidentials as encoding certainty, they should respond to such infelicitous questions by using an evidential incorrectly to represent a degree of certainty rather than type of evidence. An alternative is that they will merely echo the evidential used in the question, regardless of its appropriateness.

There were four possible conditions:

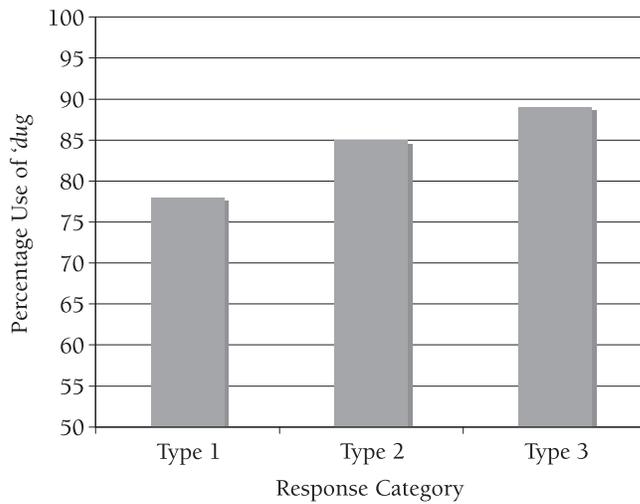
1. Visible evidence to warrant inference: Appropriate question using *yod sa red* (evidential is just right)
2. Visible evidence to warrant inference: Inappropriate evidential using *'dug* (too strong)
3. Plain view of event: Inappropriate evidential *yod sa red* (too weak)
4. Visible evidence to warrant negative inference: Inappropriate evidential using *'dug* (too strong)

To endorse the assertions in cases of the forms 1 and 2 would be to commit the fallacy of affirming the consequent, a common logical error made even by logicians. If the rule given is, "If A, then B," it is not warranted to conclude A from B. It does not follow from the premises, "If Dad is home, the bike is outside" and "The bike is outside" that Dad is home. We refer to this as type 1 responding. However in condition 4, where the rule is again of the form "If A, then B," the reasoning, "Not B, therefore not A" (modus tollens) is sound. This is type 2 responding. From the premises, "If the baby is asleep, the curtains are closed" and "the curtains are open," we can validly infer that the baby is awake. Case 3 is the most certain, the event itself being in full sight. This is type 3 responding.

If the child interprets the evidentials as marking *certainty*, the scenarios can be ordered $3 > 4 > 2, 1$. If the child is sensitive only to the evidential used in the question and follows suit (using the same evidential by default), we would expect the following order: $2, 4 > 3, 1$. If the child is sensitive to source of evidence in using *'dug*, it should only be used for case 3, so we would expect $3 > 1, 2, 4$.

Children in all age groups predominantly answered with *'dug*, even for questions in which the evidence available for the answer was indirect. There was no evidence at all that children were influenced by the form of evidential in the question asked, so they did not simply follow suit. However, two facts are of interest. First, the likelihood of their responding with *'dug* was affected by the certainty of the conclusion, as shown in Figure 3.4, a plot of the types of inference. The more certain the conclusion, the more likely they were to use *'dug* and not an indirect evidential. These results confirm our suspicion that certainty is the dimension of significance to children at these

Figure 3.4 Percentage of Responses in the Question-Answering Task Using 'dug

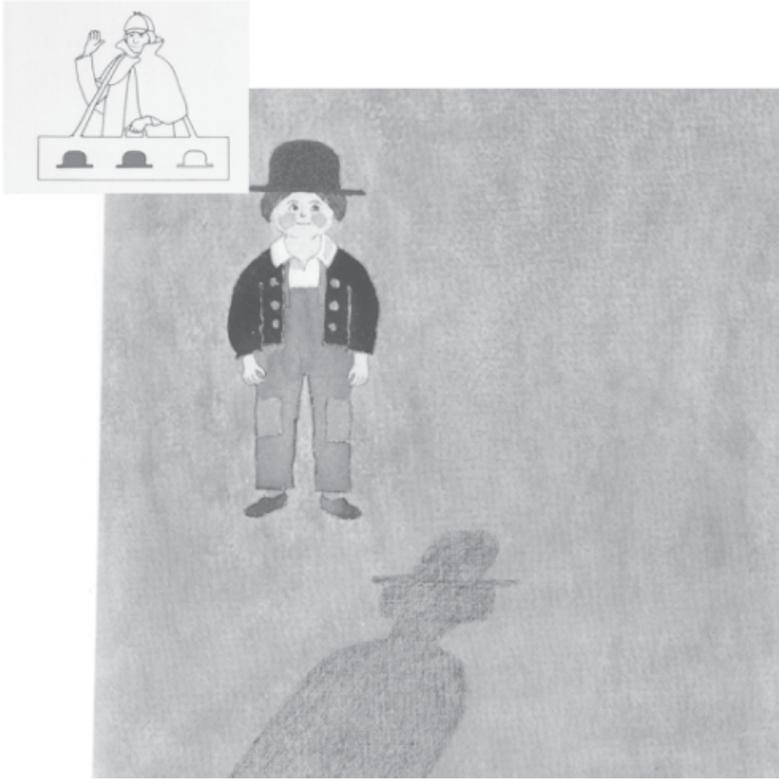


ages in their choice of evidential. Second, as we shall see, although age does not predict success on this task, inferential ability does.

Inferential Ability. The most informative inference task we used was adapted from a children's book, *Anno's Hat Tricks* (Nozaki & Anno, 1993). The book contains a series of graded questions in which the reader must take increasingly complex perspectives into account: first, the reader can infer the answer from what is seen or not seen, and then as it progresses, the reader must make inferences not just on the basis of what is seen but on the basis of what the book's characters infer from what they can see. The participants are introduced to the characters of a hatter, Tom/Tashi, Hannah/Dolma, and the shadow of a child, which they are instructed to think of as their own shadow. On each page, the hatter shows a different combination of red and white hats, and by looking at that combination and at Tom's/Tashi's and Hannah's/Dolma's hats, the participant is asked to deduce the color of her own hat, shown on the page as a shadow (Figure 3.5).

For example, the hatter says that he is taking two red hats and one white hat and placing one on Tom and one on Shadowchild (the shadow). The participants then learn from Tom that he knows the color of his own hat to be red (shown as gray in Figure 3.5) and have to figure out the color of their own hat.

The participant must infer that Tom saw that the participant's hat was a color that allowed him to know for sure that his own hat was red. If Tom had seen a red hat, then another red hat and a white hat would have

Figure 3.5 Sample Trial from the Shadowchild Task

remained, and in that case he would not be able to determine the color of his own hat. Since Tom did know the color, then he must have been able to see that Shadowchild's hat is white. The book presents progressively more difficult scenarios, and children were tested on all but the most challenging. Notice that just as in order to learn the meaning of evidentials, in order to solve these problems one must attend not only to one's own evidence, but also to what other people say in response to *their* own evidence.

Tibetan children's performance on the Shadowchild task was surprisingly high: younger children (ages six to eight) were correct 73 percent of the time and older children (ages nine and ten) 85 percent of the time. Furthermore, even when age is partialled out, the scores correlated well with the likelihood of using *yod sa red* in the questions task, in conditions 1, 2, and 4 ($r(20) = .47, p < .02$). In other words, the children with the most developed inferential ability were most able to use *yod sa red* in appropriate circumstances.

This demonstrates that Tibetan children's understanding of evidentials as revealed by their performance on the cards task is genuine and that their performance is not a product of weak reasoning skills, but a demonstration that they are representing the restrictions on denying evidentials. Recall that the English-speaking children denied the modalized proposition, the "must," about 20 percent of the time in contrast to the Tibetans, who hardly did it at all. But the Tibetan subjects significantly outperformed the English-speaking children on Shadowchild, 80 percent to 34 percent.

While this contrast suggests a cultural difference in reasoning ability, perhaps even related to the presence of evidentials in Tibetan and their absence in English, this interpretation would be premature without other measures on the two groups to ensure they were matched. However, this result does confirm that the different behavior on the deniability task between Tibetan children and English children is not an artifact of weaker reasoning skills on the part of the Tibetan children. Even for children, Tibetan evidentials are not deniable, unlike English epistemic modals.

Discussion

What can we conclude? First, we have evidence that the full system of contrastive evidentials is not available to children until quite late, long after the preschool years. Second, we find that Tibetan children aged six to ten take evidential morphemes not to be deniable, that is, not contributing to the truth value of the sentence. Third, we find that the same Tibetan children are not led by the evidential posed in a question, but base their answers on their own judgment of the scenario. However, their use of the direct evidential 'dug varies with the certainty of their knowledge, not with source of knowledge. We show that children in this age range are quite adept at inference tasks based on what people can know in a situation, and their inference ability is related to their evidential uses.

The fact that this system is not mature until around ten years of age and the fact that inference is a general-purpose capacity together suggest that the mastery of evidentials does not develop simply through linguistic maturation but recruits cognitive resources from outside the linguistic module.

Certain puzzles about the Tibetan evidential system remain. We have been emphasizing up to this point the fact that evidentials in general, and in Tibetan in particular, encode not speaker certainty but rather source of evidence. This picture is, however, clouded slightly by what we have discovered experimentally about the behavior of the direct evidential 'dug. Even adult Tibetan speakers will often use 'dug when certain of an assertion even when they have neither direct nor ego evidence for its truth.

One possibility is that 'dug may be ambiguous in Tibetan between an evidential and a certainty marker. Indeed, several interviews with Tibetan-speaking adults suggested that they viewed 'dug as a morpheme to be used when and only when one was certain of the attached statement, *regardless*

of evidence type. Others deny this and insist on its evidential force, even when their own practice appears to contradict this. And as we have seen, for children, the willingness to use evidentials other than 'dug is inversely proportional to grounds for certainty.

There may be another explanation for this phenomenon, but we have as yet no evidence that would bear on it. It is possible that when Tibetans use 'dug to express certainty, it is in fact being used not as a certainty marker itself, but rather as an ego evidential governing an elided certainty marker. So, that when—after seeing the footprints, and hearing the scratching, and seeing the missing cheese—I say *rtsi rtsi pha gir 'dug*, despite not seeing the mouse, the 'dug is functioning as an evidential governing something like *rtsi rtsi pha gir ha kho gi 'dug* (*I know [evidential] that there is a mouse over there*) with the *I know* elided.

Recall that 'dug is also used as an ego-evidential concerning internal states, including such states as hunger and emotional states. Could that be extended to examination of epistemic states? Consider the parallel to English expressions such as "It looks to me . . ." or "I see," which often have no perceptual basis. If this were the case, we would have a happy ending, with an unambiguously evidential 'dug that could nonetheless mark certainty, as opposed to a particle ambiguous between evidentiality and certainty. The claim that 'dug is unambiguously an evidential gains support from the results of the deniability protocol. Moreover, we know that 'dug can represent direct internal states, perhaps including epistemic states. Therefore, it is possible that there is a correct use of 'dug to mark certainty, even though it is an evidential. Of course, this would make it both more difficult for children to project its correct meaning and for us to determine when children are representing its meaning as a certainty marker versus a marker of source of evidence. We continue to consider subtle ways to explore these distinctions.

References

- Aikhenvald, A. (2004). *Evidentiality*. New York: Oxford University Press.
- Aksu-Koç, A. (1988). *The acquisition of aspect and modality*. Cambridge: Cambridge University Press.
- Bybee, J. (1985). *Morphology: A study of the relation between meaning and form*. Amsterdam: John Benjamins.
- Choi, S., & Aksu-Koç, A. (1999). Development of modality in Korean and Turkish: A crosslinguistic comparison. In *Selected Papers from the VIIth International Congress for the Study of Child Language* (pp. 77–96). Istanbul, Turkey: Bogaziçi University Press.
- Courtney, E. (2008). *Child production of Quechua evidential morphemes in conversations and story retellings*. Manuscript submitted for publication.
- Davis, C., Potts, C., & Speas, M. (2007). The pragmatic values of evidential sentences. In M. Gibson & T. Friedman (Eds.), *Proceedings of Semantics and Linguistic Theory 17*. Ithaca, NY: CLC Publications.
- De Haan, F. (1999). Evidentiality and epistemic modality: Setting boundaries. *Southwest Journal of Linguistics*, 18, 83–101.

- DeLancey, S. (1986). Evidentiality and volitionality in Tibetan. In W. Chafe & J. Nichols (Eds.), *Evidentiality: The linguistic encoding of epistemology* (pp. 203–213). Norwood NJ: Ablex.
- de Villiers, J. G., Garfield, J., Speas, M., & Roeper, T. (2006, April). *Preliminary studies of the acquisition of Tibetan evidentials*. Paper presented at the biennial meeting of the Society for Research in Child Development, Boston.
- de Villiers, J., Garfield, J., Kalsang, Krantz, M., Norbu, N., Sloyter, C., et al. (in revision). Who knows what and how? New evidence about the acquisition of evidentials in Tibetan.
- Denwood, P. (1999). *Tibetan*. Amsterdam: John Benjamins.
- Faller, M. (2006). *Evidentiality and modality at the semantics/pragmatics interface*. Unpublished manuscript.
- Fitneva, S. A. (2001). Epistemic marking and reliability judgments: Evidence from Bulgarian. *Journal of Pragmatics*, 33(3), 401–420.
- Garrett, E. (2001). *Evidentiality and assertion in Tibetan*. Unpublished doctoral dissertation, University of California, Los Angeles.
- Gernet-Girard, H. (2008). *Evidentials and Inference in Tibetan*. Unpublished undergraduate thesis, Smith Colleges.
- Gopnik, A. (1993). How we know our minds: The illusion of first person knowledge of intentionality. *Brain and Behavioral Sciences*, 16(1), 1–14.
- Hardman, M. J. (1986). Data-source marking in the Jaqi languages. In W. Chafe & J. Nichols (Eds.), *Evidentiality: The linguistic encoding of epistemology* (pp. 113–136). Norwood, NJ: Ablex.
- Lazard, G. (2001). On the grammaticalization of evidentiality. *Journal of Pragmatics*, 33, 359–367.
- Nozaki, A., & Anno, M. (1993). *Anno's hat tricks*. New York: Philomel books.
- Oswalt, R. (1986). The evidential system of Kashaya. In W. Chafe & J. Nichols (Eds.), *Evidentiality: The linguistic encoding of epistemology* (pp. 29–45). Norwood, NJ: Ablex.
- Papafragou, A., Li, P., Choi, Y., & Han, C. (2007). Evidentiality in language and cognition. *Cognition*, 103, 253–299.
- Plungian, V. A. (2001). The place of evidentiality within the universal grammatical space. *Journal of Pragmatics*, 33, 349–357.
- Rooryck, J. (2001a). Evidentiality, part I. *GLOT International*, 5, 125–133.
- Rooryck, J. (2001b). Evidentiality, part II. *GLOT International*, 5, 161–168.
- Speas, M. (2004). Evidentiality, logophoricity and the syntactic representation of pragmatic features. *Lingua*, 114(3), 255–276.
- von Stechow, K., & Iatridou, S. (2005). Anatomy of a modal. In J. Gajewski, V. Hacquard, B. Nickel, & S. Yalcin (Eds.), *New work on modality* (Vol. 51). Cambridge, MA: MIT.
- Wellman, H., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75, 523–541.
- Willett, T. (1988). A cross-linguistic survey of the grammaticization of evidentiality. *Studies in Language*, 12, 51–97.

JILL G. DE VILLIERS is the Sophia and Austin Smith Professor of Psychology and Philosophy at Smith College, Northampton, Massachusetts. E-mail: jdevil@smith.edu.

JAY GARFIELD is Doris Silbert Professor in the Humanities, professor of philosophy at Smith College, Northampton, Massachusetts, professor of philosophy at the University of Melbourne, and adjunct professor of philosophy at the Central University of Tibetan Studies, Sarnath, India. E-mail: jgarfield@smith.edu.

HARPER GERNET-GIRARD is a recent graduate of Smith College, whose honors project in philosophy contributed much to this chapter. E-mail: hgernet@alumnae.smith.edu.

TOM ROEPER is professor of linguistics at the University of Massachusetts, Amherst, Massachusetts. E-mail: roeper@linguist.umass.edu.

MARGARET SPEAS is professor of linguistics at the University of Massachusetts, Amherst, Massachusetts. E-mail: pspeas@linguist.umass.edu.